Food and Nutrition Sciences, 2022, 13, 577-599
https://www.scirp.org/journal/fns
ISSN Online: 2157-9458
ISSN Print: 2157-944X

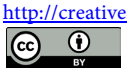
Socio-Cultural Perception, Attitude and Behavior That Affects Malnutrition Incidence among Children in Maiduguri, Borno State, Nigeria

Chukwuebuka Emmanuel Nwoke

Department of Public Health, Texila American University, Georgetown, Guyana
Email: emmab1755@gmail.com

How to cite this paper: Nwoke, C.E. (2022) Socio-Cultural Perception, Attitude and Behavior That Affects Malnutrition Incidence among Children in Maiduguri, Borno State, Nigeria. *Food and Nutrition Sciences*, **13**, 577-599.
https://doi.org/10.4236/fns.2022.136044

Received: November 6, 2021
Accepted: June 27, 2022
Published: June 30, 2022



Abstract

The incidence of malnutrition in Maiduguri came under global observation in 2015. It had been on the gradual decline prior to the year 2018 as reported by the United Nations in 2017. There has been an alarming resurgence of malnutrition cases within the year, 2018. This study is aimed at explaining the relationship between the resurgence in the incidence of Malnutrition within Maiduguri and the strong sociocultural practices among the indigent people within Maiduguri. It was found out that 54.67% of the 150 randomly selected respondents agreed to have had their Children being placed on RUTF by medical personnel. It also noted that about 54% of the entire respondents had no idea of the importance of the RUTF being prescribed for their children. About 39% of the entire sample population preferred the complementary feeding type to other feeding types. 56% of the respondents had their deliveries conducted at home while only 38% had theirs in the hospital. It is relevant to note that wrong health practices like wrong feeding practices, child marriages and poor health-seeking behaviors are one of the main drivers of malnutrition in our society. One of the most effective means of reducing the incidence of malnutrition is by tackling poverty and encouraging education of children irrespective of their gender or physical challenge.

Keywords

Malnutrition, Incidence, Perceptions, Attitude, Culture

1. Introduction

1.1. Background of Study

Malnutrition can be understood as an imbalance between the intake of nutrients

and the actual need of the body. The inability of the daily metabolic needs of the body to be satisfied over a long period of time would result in malnutrition. Malnutrition becomes complicated in the presence of medical conditions such as diarrheal diseases, lower respiratory tract infections, helminthiasis, skin infections etc.

With the sudden rise in the activities of the insurgents, worsening climatic conditions especially droughts, in the Northeast Nigeria, farmers and herdsmen conflicts; farmlands and different source of livelihood of the people has been depleted. It has been bad enough to result in the people who were formerly independent to be dependent on alms and external aids for survival. The existent poor political intervention has made access to small scale loans even more difficult.

There has been destruction of infrastructures in the hinterlands which and has made health care delivery to the affected people in the region extremely difficult. The surviving people live as displaced individuals in the state capital, Maiduguri. These settlements are poorly organized and have led to outbreaks of different ailments like measles, cholera, diphtheria, pox disease etc. There is poor sanitation in this settlement, and they do not have a clean source of drinking water.

The combination of poor settlement, poor food source, poor water source, disease outbreaks and inadequate and poorly equipped health facilities over a long period would lead to the increase in the incidence of malnutrition in the region. Malnutrition has always existed in the region but has worsened overtime especially with the increased activities of insurgents in the region.

Malnutrition is a menace if improperly handled. It increases the susceptibility of the child or adult to infection. Children affected are mainly within the age of 6 months - 59 months, other age group of less than 6 months and more than 59 months can also have malnutrition, but they only constitute a minor sect. Adults affected are mainly women-lactating and elderly women.

1.2. Statement of Problem

There are many cultures in the region that undermine the efforts of healthcare providers, nutritionists, and outreach officers. This culture is so awkwardly implemented and sometimes modified in alarming conditions making malnutrition case acquisition, treatment, and recovery very difficult.

The existence of these cultures makes the cases of malnutrition in these regions popular and sustained. It recycles the incidence of malnutrition in the region and makes even the implementation of supplemental feeding programs even tougher. For instance, most of the people living in the Northern Nigeria tend to affiliate more with grains like millet, sorghum, without supplementing them with proteins. Meat is most of the times, reserved for special occasions for certain families in the Northern Nigeria. This can go a long way in explaining the persistent malnutrition in the North. This research aims to provide a perspective to this problem.

There exist perceptions and attitudes among people in the region which hamper malnutrition intervention programs in the region. After so many years of nutritional programs in the region, there are still multiple new episodes of malnutrition.

1.3. Purpose of Study

This study aims at understanding the perceptions, attitude, and beliefs of people in Maiduguri and how it affects the incidence of malnutrition; It has the following objectives:

- It aims at introducing the concept of sociocultural malnutrition which is a manifestation of the combination of complex behavioral metamorphosis to the incidence of malnutrition. This simply means that the study aims at relating the effect of attitude and behavioral modifying factors in the society which could eventually lead to malnutrition.
- The study also aims at improving the knowledge base of archaic cultures, attitudes and perceptions militating against the recovery of children from malnutrition in the region.
- The research also would provide a road map for a broad-based insight into socio-cultural issues in the field of public health nutrition.

1.4. Research Question

What are the perceptions of the people living in the Maiduguri concerning issues related to nutrition?

What attitudes of people from the Maiduguri are likely to cause malnutrition in their children?

What cultures of the people in Maiduguri influences strongly, the incidence of malnutrition in the region?

What solutions or approach is best to be applied to the concept of sociocultural malnutrition based on the highlighted contexts of the different regions?

What is the health-seeking behavior in Maiduguri and how does it affect the incidence of malnutrition?

1.5. Significance of Study

This study would be a great tool in designing future malnutrition intervention programs in the Northern Nigeria based on the highlighted context. It would be an indispensable template for organizations, government agencies and firms seeking to set up projects or investments related to nutrition in the region.

This would be an important eye opener to the understanding of psychology of indigenes living in the Northern region of Nigeria. It is going to help policy makers, administrators and health care providers in the execution and integration of a context-sensitive project. The study would help the government in making decisions relative to the perceptions, culture, and attitudes of the people in the region.

The research work would serve as a reference tool in the field of nutrition. It would provide innovative approach to the menace of malnutrition in the region.

1.6. Justification of Study

A public health emergency was declared in the northeastern region of Nigeria in June 2016. Multiple rapid evaluations were conducted in all the newly liberated from the Boko Haram Terrorists' control suggested high rates of mortality and prevalence of acute malnutrition had exceeded emergency levels [1]. This level of mortality was massively reduced by the end of 2017 with the intervention of multiple international organizations.

However, in the year 2018, there has been markedly sharp rise in the malnutrition incidence despite the people not being under any form of captive [2]. This can be related to so many factors, but the socio-cultural factors seem to be the most important of them all.

This study would explain the cause of the resurgence in malnutrition within Maiduguri through studying the relationship between the sociocultural practices and malnutrition incidence.

1.7. Scope of Study

The researcher divided the Maiduguri town into segments to ensure the result is representative of every segment of the city. The study would be within Maiduguri only and a stratified sampling method would be adopted in selecting participants.

1.8. Limitations to Study

This study was limited to only Maiduguri. The cultures and behavioral patterns to be identified would be all inclusive of all the patterns propagating malnutrition.

The study was conducted only during the day and in the absence of harsh weather conditions.

1.9. Assumptions of Study

It is assumed that there would be adequate security in the areas of study. The security within Maiduguri is quite unstable with isolated acts of lawlessness. This study assumes that there would not be any form of violence during and around the area of study.

It is also being assumed that there would be good weather conditions to allow for survey.

1.10. Definition of Terms

1.10.1. Ready-to-Use Therapeutic Food (RUTF)

Ready-to-use therapeutic food (RUTF), as can be seen in **Image 1**, is given during the management of a severely malnourished child.

Image 1. Ready to use therapeutic food (RUTF) and Ready to use supplementary food (RUSF). Source: Public health notes [3].

It does not need any form of cooking, or any other process before feeding the child. It is a high energy food contained in a concentrated form, enriched with minerals and vitamins to replenish a severely malnourished child.

1.10.2. Severe acute Malnutrition (SAM)

It is caused by a significant imbalance between nutritional intake and individual needs. It is most often caused by both quantitative (number of kilocalories/day) and qualitative (vitamins and minerals, etc.) deficiencies. Severe acute malnutrition is defined according to the world health organization by "a very low weight for height (below -3z scores of the median WHO growth standards), by visible severe wasting, or by the presence of nutritional edema".

1.10.3. Community-Based Management of Acute Malnutrition (CMAM)

CMAM is a systematic approach for treating acute malnutrition in young children using a case-finding and triage approach.

The Community-Based Management of Acute Malnutrition (CMAM) method help community volunteers to locate and start early treatment for children with acute malnutrition living in a particular area of a community before they become too sick.

Caregivers provide the treatment for most of the children with severe acute malnutrition at home using the weight appropriate Ready-to-Use-Therapeutic Food (RUTF) and routine medications.

CMAM was designed to reduce the incidence of malnutrition, improve public health and food security in a sustainable manner within a particular community. The program also works to integrate treatment with a variety of other longer-term interventions.

In some cases, severely malnourished (SAM) children with medical complications and lack an appetite for food or RUTF are referred to an in-patient care location for intensive medical treatment.

2. Literature Review

Malnutrition is a well-researched study area in the world however not much work has been done in the sub-Saharan region of West Africa. This does not come as a surprise due to the incidence of malnutrition began very recently due to the recent civil unrests, insurgency [1], worsening climatic problems, and poor governance.

2.1. Search Strategy

This study acquired most of its literature using the PubMed and some parts were acquired using the Google scholar website. The search was conducted using some specific key words which were coined from the topic of this research work.

A total of 1110 materials were initially gotten from the search however these research works were narrowed down to 550 as shown in Figure 1, when only research work done in the 21st century was searched for as was referenced in Table 1. It was further narrowed down to 200 when only malnutrition related to

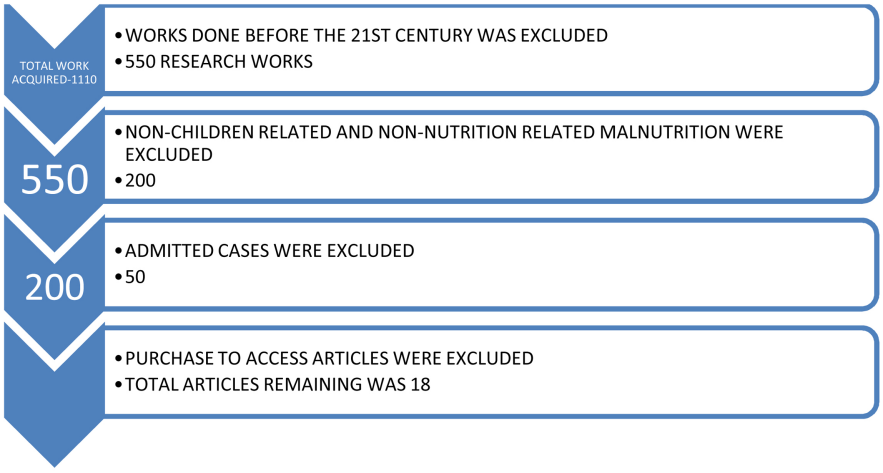


Figure 1. Flowchart of resource acquisition.

Table 1. Method of resource acquisition.

research	inclusion criteria	exclusion criteria
works done before 21st century		
purchase to access		
non-children related malnutrition		
unpublished articles		
non-hospital related cases		
works done within the region		
works done outside the region		
non-English language articles		
non-nutirtion related malnutrition		

children was adopted. The number reduced to 50 when only malnutrition not admitted into the hospital was used. Some of the materials could not be accessed and required to be bought, these materials were dropped, and the free ones were utilized. It further came down to 10 research works based on the quality assessment of each work. It was further organized based on international, regional, sub-regional, national, and local.

The research works were further classified based on the geographical regions that research was conducted.

2.2. Findings

As shown in **Figure 1**, out of the 18 acquired works, 10 research works were chosen for the purpose of this review as they maintained most of the inclusion criteria.

Research conducted byLeidman *et al.* [1] in 2017, on the acute malnutrition among children, mortality and humanitarian interventions in conflict affected regions in Nigeria from October 2016-March 2017. The study was aimed at providing evidence of a very high mortality (particularly among children), to elucidate adequately the level of damage being done by the insurgents and to reiterate the need for an increased effort in scaling up access to treatment services in the conflict-prone area. The study underscored the increased mortality rate among malnourished children within Borno State and noted the increased preference for public health institutions.

A study conducted by Deconinck *et al.* [4] in 2016, was on the factors that influence the integration of acute malnutrition interventions into the national health system in Niger. This work was done among malnourished children, and it is a qualitative study done within the 21st century.

Martinez-Hersch P. and Pisanty-Alatorre J. [5] in 2016, worked on the chronic under nutrition in school children in Gurrero, Mexico. Their work dwelt on malnutrition in children which is one of the inclusion criteria of this research work. They also did their research in the 21st century and included children admitted for malnutrition complications. Their work was free and was not done in English language but French. Google translator was utilized in the translation of their work.

Reiger M. and Wagner N. [6] in 2015, studied the interaction between the child's nutritional status and their memory. This work passed almost all the inclusion criteria for the research. It was of course published in the 21st century, involved malnourished children who were admitted and access to the research work was free. Their work showed very palpable evidence to the relationship between child nutrition and their memory. They further recommended the need for long-term feeding programs that work help in memory, learning and cognitive development of school aged children.

In 2012, Hankard R. *et al.* [7] researched on the need to track under nutrition in routine practice, malnutrition screening in clinical practice. This research work

again fulfilled all the inclusion criteria by conducting the research utilizing malnourished children gotten during clinical consultation even though not the entire children were admitted. The research was all about the incorporation of screening for malnutrition in the normal clinical practice. This would help nutrition program coordinators, nutrition officers, clinical nutritionists, and nutrition assistants in mobilizing malnourished children to receive adequate optimal care. They proposed the drawing up of a proper nutrition strategic care plan for acquired cases in all the health facilities in the region.

Pandolfi M. *et al.* [8] in 2012, worked on the malnutrition in school children in the urban-rural region of the extreme south of Sao Paulo city. This research again adopted most of the inclusion criteria. It aimed at evaluating the nutritional status of school children in order to make correlations and interpretations in relation to their qualitative attributes like age, sex, grade and school period. This work would help the inherent government in the region to adjust their policies to health care provision and assist health care givers strategize better ways to address malnutrition in the region.

Research conducted by Dearth-Wesley T. *et al.* [9] in 2008, on the under- and over nutrition dynamics in Chinese children and adults from 1991-2004. The attempted understanding the link between income and residential differentials with the existence of under and over nutrition in China within the study period. They found out that malnutrition was more prevalent among the poor families than the wealthier families. They also discovered that the trend of over nutrition was remarkable especially among the poor considering their socioeconomic status. There were found to be higher incidence of over nutrition in the poor families than the richer families. This study would help future researchers in the field of nutrition understand the pattern of malnutrition in China and help in shaping health promotion activities in the country. This study would also help policy makers in making informed decisions concerning their citizens.

These findings would enhance my approach to the treatment of malnutrition by enabling me in the thorough assessment of all malnutrition cases considering their socioeconomic and other factors that would lead to relapse of treatment and recurrence of cases. It would also help me in planning for each year, with good evidence of when to expect more patients and why patients present more during a certain period.

It would also help make recommendations for outreach officers and administrators on how best and where to channel our resources. It will help program planners develop cost effective plans and contingency plans based on my analyzed data set.

The findings would encourage more research into other critical areas of the field. It would build the knowledge base of the field and provide evidence-based data about the happenings in the field of nutrition. It would advance the concepts and modify the approach of similar contexts in the field of nutrition in the region.

3. Methodology

3.1. Study Area

The study area was Jere Local Government Area, one of the 27 Local Government Areas of Borno State. The Local Government Area was carved out of the Maiduguri Metropolitan Council (MMC) in 1996 [9]. It lies between latitudes 11˚40'N and 12˚05'N and longitudes 13˚50'E and 12˚20'E. it occupies a total area of 868 km^2 [10].

The climate of the area is characterized by dry and rainy seasons with minimum temperatures ranging between 15˚C and 20˚C and the maximum temperatures ranging between 37˚C and 45˚C. The annual rainfall measures between 500 mm and 700 mm every year [11]. The rainy season is usually from May to October with low relative humidity and short rainy seasons.

The topography is generally sandy with short grasses and thorny shrubs.

Jere Local Government Area has a population of 211,204 persons as at 2007 National census with annual growth rate of 2.8% [12]. it must however be noted that the population within Jere Local Government Area has more than quadrupled since the severe activities of Boko Haram Terrorists in 2010.

Majority of the inhabitants are farmers, traders, and civil servants. The major ethnic groups are the Kanuris and Shuwa-Arab. Others include Hausas, Bura and Fulanis with many other migrants from within and outside Nigeria [13].

3.2. Study Population

The study population was consenting individuals located and residing in Maiduguri. The consenting respondents would receive a self-administered questionnaire to complete. Respondents that are unable to read and understand would be interviewed with the content of the questionnaire.

3.3. Study Design

This research work adopted a cross-sectional study method in ascertaining the understanding of the perceptions, attitude, and beliefs of people in Maiduguri and how it affects the incidence of malnutrition.

3.4. Sampling Size

The sampling size in this research work was determined by the prevalence rate of Malnutrition in Maiduguri previously.

The sample size was determined by this formula:

$$N = Z^2 P(1-P)/D^2$$

where, Z = 1.96 at 95% confidence limit

P = Prevalence from previous study, 11% (0.11)

D = Margin of error tolerated, 5% (0.05)

N = Minimum sample size

$N = 1.96^2 \times 0.79\ (1 - 0.79)/(0.052)$

$N = 3.8416 \times 0.11 \times 0.89/0.0025$

$N = 0.376/0.0025$

$N = 150.4$, N = ~150 Respondents.

3.5. Sampling Method

The stratified random sampling method was utilized for this survey because:

- The population of study was subjected to same level of conditions with unequal level of response.
- The study population is residing in a particular understated area in Maiduguri with different level of exposure and affectation.
- The population under study was quite heterogeneous and so different parameters of stratification like Age, level of education and occupation would be used in the segregation of the respondents.

3.6. Instruments for Data Collection

A structured questionnaire was the main instrument for collecting data. It is made up of close-ended and a few open-ended questions.

The questionnaire was be interpreted for respondents that are unable to read or understand.

Consent of the respondents would be sought before the questionnaire is administered. The content of the questionnaire, the aims and objectives of the study would be appropriately explained to the prospective respondent. Opportunity for the clarification of any doubts will be provided to every respondent.

3.7. Data Analysis

Data was analyzed both manually and with SPSS program.

It was here, presented in different forms of statistical analytical tools. The 95% confidence limit will be applied in all the statistical tests.

Statistical Analysis

The survey was analyzed with IBM SPSS Statistics version 23 and Microsoft Excel version 2010.

3.8. Plans for Reliability and Validity of Data

- Detailed explanation of the objectives of study
- Use of simple goal-directed questions
- Ensuring the privacy of the respondent while filling the questionnaire
- Assuring the respondents of the confidentiality of the questionnaires.

3.9. Ethical Considerations

This study was clearly explained to the potential respondents.

Official and verbal consent were appropriately sought, and the filling of the questionnaire were strictly by choice.

4. Result and Discussion

One of the main factors that could affect the validity and reliability of the results is the reluctance of study participants in completing the survey questions. However, the percentage of the unwilling respondents was minimal and was adequately compensated for, by the adequate sampling method adopted which was representative of the study population.

It was noted that women were more eager to participate in the study than men with about 56% of the respondent being women because most of the female respondents were not engaged to an occupation. Besides, women play a major role in the care of children and were even more important, based on the context of study.

4.1. Survey of the Respondents' Perception

The study of the perception of the respondents generated mixed reaction to the subject of malnutrition such as referenced in Figure 2 and Table 2 which show the respondent distribution.

4.1.1. RUTF Use and Misuse Perception

It was identified that 54.67% of the entire sample respondents agreed to have

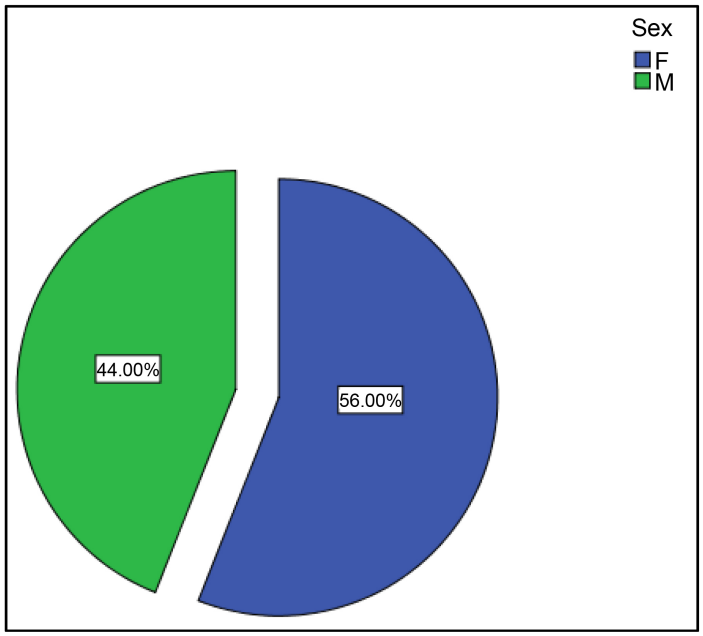


Figure 2. Gender distribution of the respondents.

Table 2. Employment distribution of respondents relative to their gender.

	Employment Status	
Sex	Employed	Unemployed
F	27	57
M	28	38

had their Children being placed on RUTF by medical personnel as shown in Figure 3. It was also noted that 54% of the entire respondents had no idea of the importance of the RUTF being prescribed for their children as was referenced by Figure 4.

The survey participants agreed that women and children from well-to-do backgrounds purchase RUTF from marketplaces and small shops in strategic areas. Field site visits by the study team also confirmed that RUTF sachets were sold both in pharmacies and by caregivers enrolled in the CMAM program at various sites within the study area including by those discharged from stabilization centers.

RUTF sachets are collected by traders who usually come from nearby towns to buy RUTF from caregivers. The traders would take RUTF from villages and sell

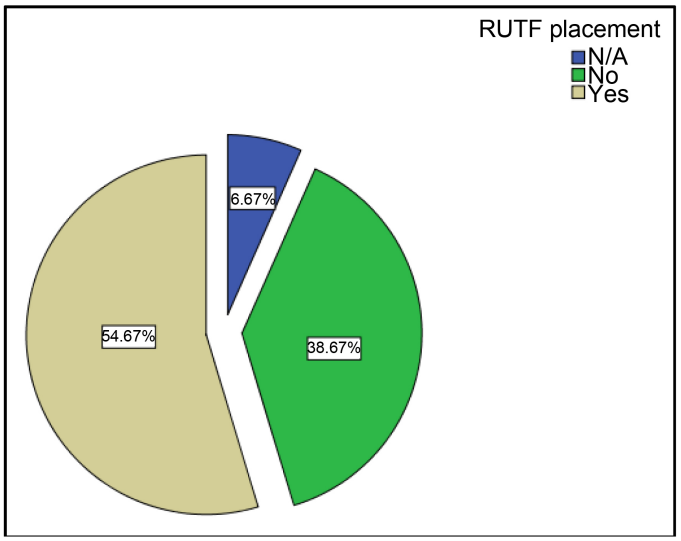


Figure 3. History of RUTF-use.

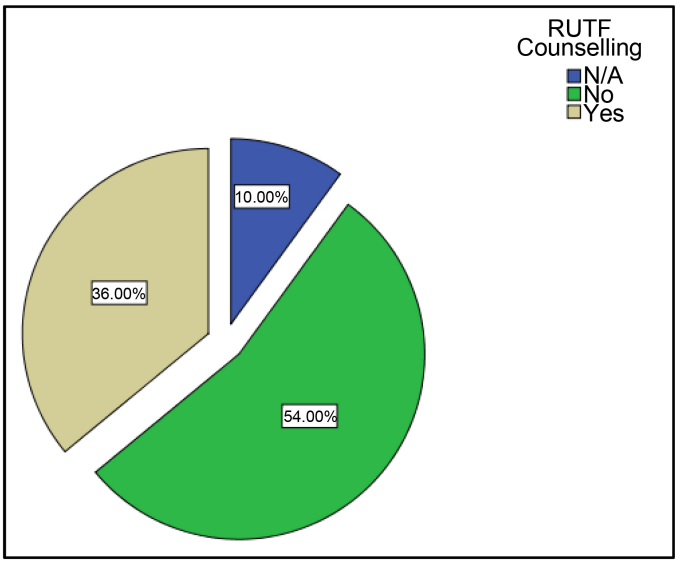


Figure 4. RUTF counselling survey.

it to school children, teenagers, truck drivers who want a high energy easy to carry snack following a story by one of the respondents.

Caregivers were also perceived to make up different identities of SAM children so that a child simultaneously could be admitted to different CMAM programs of different organizations. It was also discovered that the Children are presented by different caregivers using different names of the child [14].

4.1.2. Child Feeding Practices and Malnutrition Incidence

As shown in **Figure 5**, 39% of the entire sample population preferred the complementary feeding type to other feeding types when feeding their children <6 months.

Exclusive and complementary feeding are important ingredients for the appropriate nourishment and development of children [15]. The breast milk is very crucial in adequate immunity and nutritious embellishment as well as mental development of the child. The World Health Organization [15] recommends the practice of exclusive breastfeeding for 6 Months before the introduction of other additional feeds.

Hop *et al.* [16] agree that the early introduction of additional feeds before 4 Months (complementary feeding) is associated with poor growth rate. This can be related to the increased practice of complementary feeding (39% of sample population) in Maiduguri which can lead to the increased incidence of malnutrition.

4.2. Attitude Survey

4.2.1. Attitude to Maternal and Child Health

It was interesting to note that most of the respondents, as referenced by **Figure 6**, would prefer a home delivery to a hospital conducted delivery. 56% of the

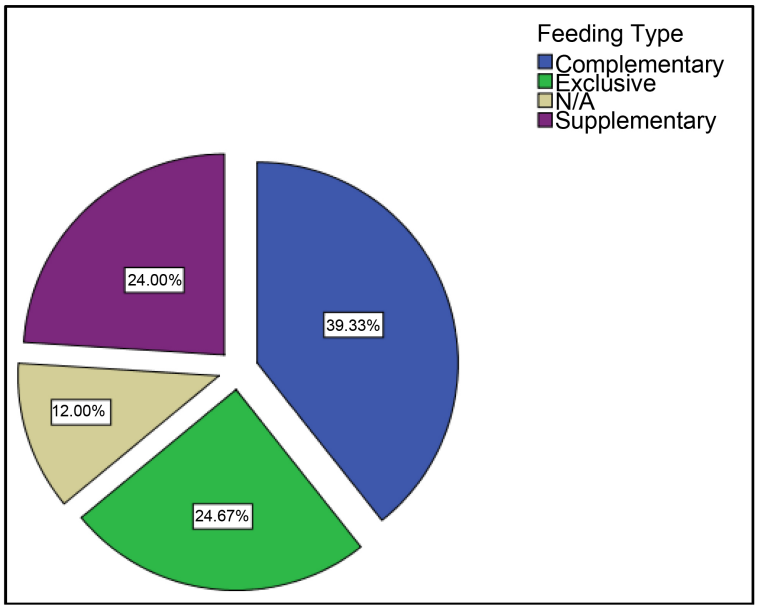


Figure 5. Feeding type practiced or in current use.

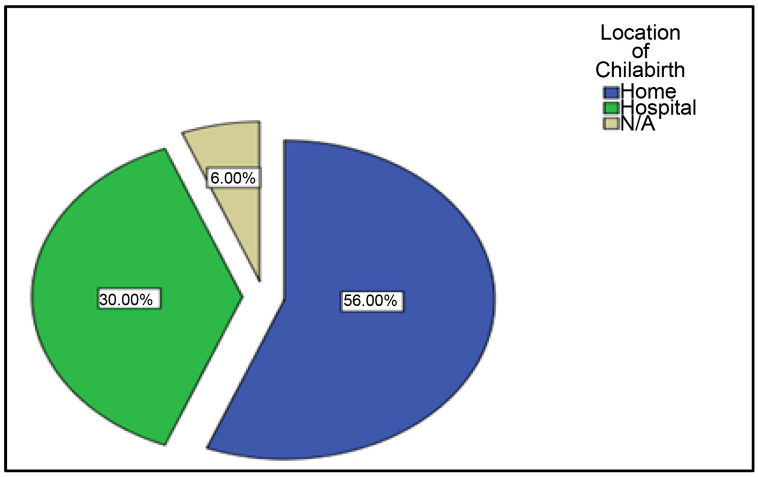


Figure 6. Preferred childbirth location.

respondents had their deliveries conducted at home while only 38% had theirs in the hospital.

According to the World Health Organization [17], more than 500,000 maternal mortalities occur yearly of which over 95% being ascribed to the sub-Saharan Africa and Asia.

It is very unfortunate that despite this statistic of mortality, child births still occur at home which could lead to maternal morbidity and mortality. The surviving children might be poorly catered for in the absence of their mother to breastfeed them, and this could be another mechanism leading to the increase in malnutrition incidence in Maiduguri.

4.2.2. Health-Seeking Attitude for Child Illnesses

Furthermore, as shown in **Figure 7**, 61.33% of the responders prefer receiving treatments in the hospital, 26% would choose chemist treatment over any other form of treatment while 12.67% of the entire study population prefers home treatment to other treatment form.

Health-seeking attitudes are mainly dependent on different contexts. It differs depending on factors such as physical, socioeconomic, educational status, gender discrimination, cultural practices, religious principles, political situation, disease trend and the situation of the healthcare system [18]. The role played by the level of education in the health seeking behavior is still not clearly understood in the incidence of malnutrition in Maiduguri because of existent cultural practices. Most of the cultural practice are not limited by the level of education especially the role of patriarchy in decision making within a household.

In Maiduguri, based on the survey collated, about 39% of the entire sample population would not like to utilize the services of a hospital. This could be due to the socioeconomic situation of the town in which just over 30% of the study population is employed.

Another thought could be due to the stringent cultural practices which are very existent in Maiduguri. One of the cultures include giving birth to first

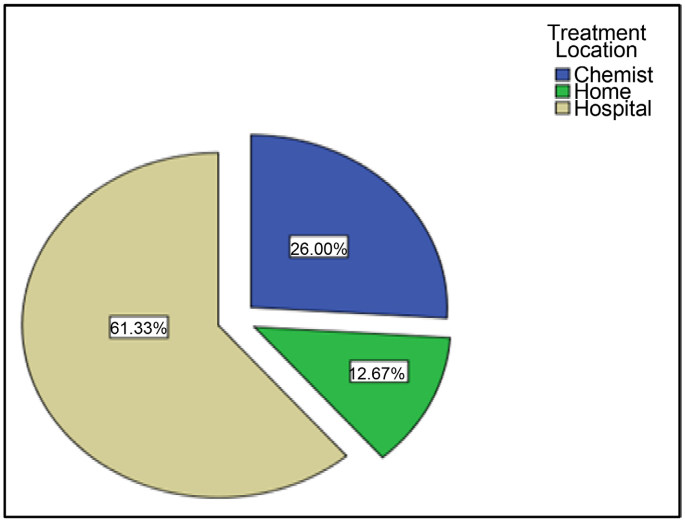


Figure 7. Preferred childbirth location.

children at home and total submission to the husband. The culture encourages patriarchal dominance which decreases access to healthcare by women till permission is obtained [19].

4.2.3. Consent to Hospitalization

It was quite interesting to note that only 78.91% of the entire respondents according to **Figure 8**, would give consent to any form of hospitalization while 21.09% would decline vehemently to any form of hospitalization.

Access to hospitals depend on variable predictors which are context reliant according to McAlister *et al.* [20]. It would not come as a surprise especially with more than 40% of the study population being poorly educated and about 30% being well-educated.

4.3. Culture Survey

4.3.1. Child Marriage and Malnutrition Incidence

From **Figure 9**, 52% of the respondents got married before they were 20 years old and more than 80% of this class of respondent was females. This is in line with the African culture that allows children as little as 14 years and above to get married [21].

The laws against child marriages are either loosely applied or are never applied in African countries [22]. From the conducted study, more than 52% of the study population got married before the age of 20.

It must also be noted that poverty is the main driver of child marriage according to Nour (2006) [23]. More than 30% of the study population survives on <1 dollar and 80 Cents per day. The incidence of malnutrition occurs following the improper and inadequate care received by the children [14].

Child marriages predispose the mother to early motherhood without much orientation of the existent challenges thereof. Girls who get married quite early are more often from poor background and tend to have inadequate education

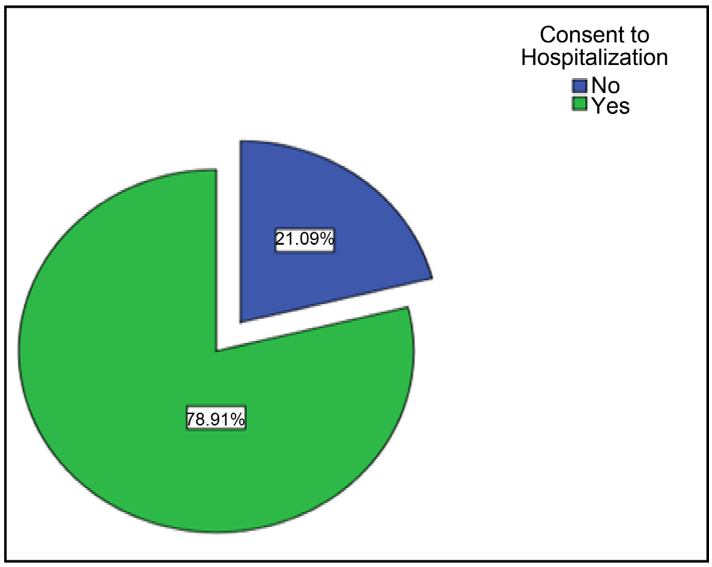


Figure 8. Consent to hospitalization survey.

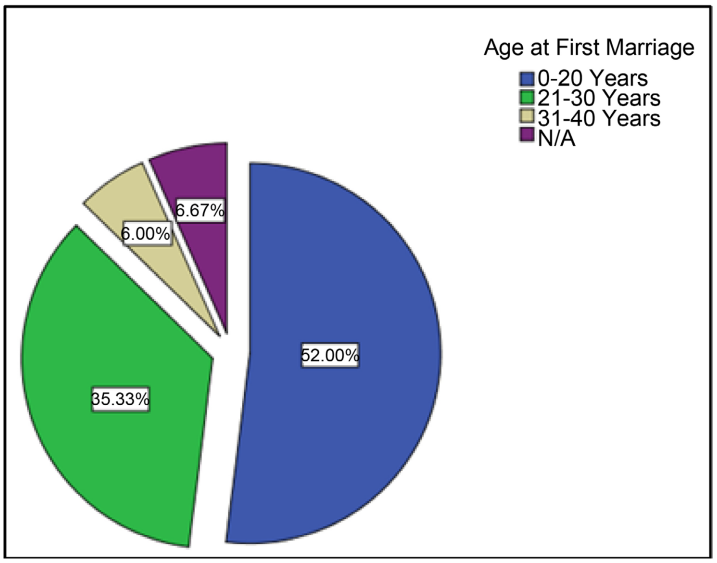


Figure 9. Age at first marriage.

Table 3. Age at first marriage relative to the gender of respondents.

		AGE AT THE FIRST MARRIAGE			
		0 - 20 YEARS	21 - 30 YEARS	31 - 40 YEARS	41 - 50 YEARS
Sex	F	66	13	2	3
	M	12	40	7	7

[23]. The study showed that there are more poorly educated people in Maiduguri than the well-educated. It was also noted that there are lots of people living below <1 dollar and 80 Cents per day.

In Marriages, the women must move away to their spouse home. Coping with

the unfamiliar terrains outside their comfort zone usually, is challenging for anyone and even worse for them [22]. They end-up being careless and reckless mothers without much education and direction from experienced mothers [23].

The culture of child marriage is the root of most maternal-related morbidities and mortalities in the Northern Nigeria [22]. Maternity related morbidities and mortalities are further amplified by the age of the mother [24]. As was referenced on **Table 3** which showed the distribution of age at first marriage in Maiduguri. Most pregnancies recorded are usually soon after marriage in Maiduguri consistent with Nour, 2006 [23].

4.3.2. Poor Child Spacing and Malnutrition Incidence

Majority of the study population was said to have at least 4 children. As shown by **Figure 10**, 55.33% of the population had children within 6 Months and 59 Months of age.

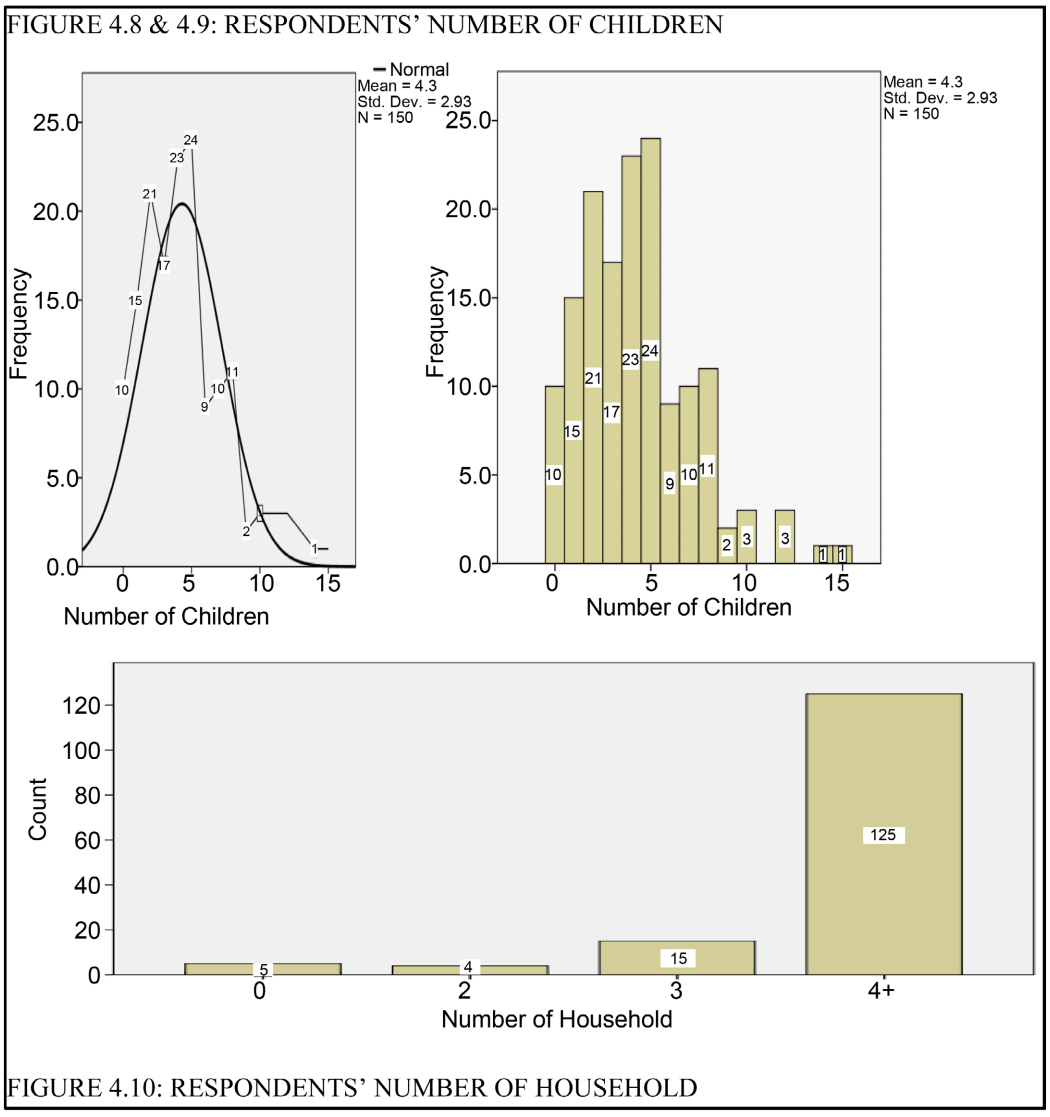


Figure 10. Respondents' number of household.

One of the drivers of malnutrition in Maiduguri is the poor child spacing attitude noticed among the Maiduguri people. The reason behind the poor spacing could be due to poor knowledge of available contraceptives which are forbidden by the culture in the index population. The study showed that more than 70% of the sample population had at least 4 children as shown by **Figure 10**.

Families in Maiduguri are usually very large with more than 80% of the entire sample population having at least 4 relatives living with them in same house. This means that the little resources provided by the breadwinner (which is mostly always the father) are usually shared amongst the family and relations. The adults get the largest share of the food with little portions reserved for the children who end up poorly fed and malnourished consequently.

5. Recommendations

The following recommendations were made to help in tackling the problems of malnutrition in Maiduguri.

5.1. Continual Enhancement of Programming That Promotes Community and Systems Resilience

"The relentless cycle of shocks and emergencies are driving high rates of poverty and indebtedness among much of the population" [25].

The incorporation of resilience programming has become a popular standard for development mainstreaming in the developing world today and for straightforward reasons [26]. Community and systems programming especially health-oriented systems should have a wider systems outlook, going beyond just the household and community resilience but to strengthen safety spaces (for women protection and empowerment) and the underlying resources on which communities rely like basic amenities (Such as Food, water, and shelter).

Furthermore, this expansion must be directed in such a way as to understand the multiple needs and barriers of agricultural communities versus agro-pastoralists in developing worlds. Unless these salient but significant shocks to survival are tackled, it is unlikely that efforts to achieve acceptable proportions in food security or need reduction will be attainable.

5.2. Promotion of Climate-Smart Programming

Nigeria boasts of being a signatory to multiple climate change initiatives including the Paris agreement for Climate Change of 2016, however none of her national policies demonstrates any leaning towards promotion of climate-smart agriculture practices.

Climate shocks are most likely to increase in the coming years, further worsening the erratic precipitation patterns and potentially raising the occurrence of both floods and droughts [27].

Research and innovation should be encouraged to actualize the most effective climate-smart agricultural practices, expand access to improved and resilient

seeds, strengthen early warning and response systems, and increase the availability of irrigation and water conservation schemes. These are indeed key strategies to explore.

Extremely poor households are less likely to take unnecessary risks in their food production. A promotion activity of climate-smart agriculture needs to be propagated using evidence-based practice. They should be based on principles of social and behavior change that addresses the very real barriers these people face.

5.3. Strengthen the Delivery of Facility- and Community-Based Health Services

Decreasing the morbidity in children can be attained through prevention and early rapid diagnosis and treatment. It is important because of its role in the reduction of the extremely high levels of acute malnutrition.

To ensure sustainability, international and national humanitarian organizations should seek to partner with the Nigerian government in reinforcing the capacity of health facilities and its staff, including up scaling supplies and supply chains, training, and supportive monitoring of staff, with the intent of enhancing output and support of community-based providers and volunteers. Public-Private Partnership in recent practice was introduced in 1992 in United Kingdom by the British Conservative government and subsequently expanded across the world. It is in current use to improve the outcomes in the health sectors in countries such as the United State, United Kingdom, Eastern Europe, Asia Pacific countries, and it is also being applied in African countries such as South Africa, Egypt, Ghana, and Botswana [28].

Extensive attitude-centered tact should be formulated that would encourage health and good hygiene attitudes to prevent illness, promote health-seeking attitudes, and improve adequate feeding practices. Steg *et al.* [29] agrees that the quality of the environment depends mainly on the behavioral pattern. Armitage *et al.* [30] found out the outcomes of behavioral patterns are very modifiable but intentions and self-prediction are better predictors than subjective measurement.

5.4. Emphasize Livelihood Opportunities for Women

"Empowering women and girls are the focus of SDG 5, Achieving Gender Equality. But, like the need to work in partnership (SDG 17), women's empowerment is a red thread that stitches all the SDGs together" [31].

Several studies have shown that women in many places are capable of adequately utilizing their own incomes.

Programs can build on illustrations like Save the Children's promotion of home gardening through their STEER (Systems Transformed for Empowered Action and Enabling Responses for Vulnerable Children and Families) project in Kaduna and other states in the North Central region of Nigeria [32] which is a program directed at encouraging women into utilizing little spaces to farm and sell produce to them for cash.

Any programming that seeks to address gender mainstreaming in Nigeria must

be hinged on adequate research finding to enable the adoption of a context-sensitive approach, like the involvement of religious and community leaders to encourage acceptability of such programs.

5.5. Encourage Better Nutrition-Related Attitudes and Tackle Any Obstacles to Change, Using a Multi-Sectorial Approach to Socio-Cultural Change

Behavioral modification is an important ingredient in several nutrition-related issues: infant and young child feeding (IYCF); Health-seeking attitude for sick children; family planning (FP); women's empowerment and gender mainstreaming and agricultural practices, like in the use of climate-smart agricultural initiative.

Modifying attitude in a coordinated way, using multiple channels, is more likely to be effective. Kinmonth *et al.* [33] agrees that the use multiple appropriate channels in communication could effectively lead to a sustainable behavioral change. This can be achieved using cooperative societies, focused group discussions, community outreach programs, use of mass media like radios, television, and social networks.

Research studies should be focused on how to encourage men to be involved in supporting their children within the acceptable local contexts and how women can be empowered in a culturally acceptable manner.

5.6. Promotion of Female Education

Formal education may promote health knowledge to future mothers, it may through the numeracy and literacy skill help the mother in early diagnostic skill thus improving health-seeking attitude [34].

Education makes women more familiar with the modern society hence, improving their reception to medicine and thus promoting health and nutrition outcomes [34]. Programs that promote female education should be invested in, to reduce the incidence of malnutrition.

McAllister *et al.* [20] agrees that investing remarkably in the quality of education for women would help reduce maternal and child mortality.

6. Conclusions

The incidence of Malnutrition can be curbed by implementing the right programs in a culturally acceptable way that is context-oriented and empowering women through education and promoting activities that would improve their livelihood.

Ending malnutrition in Maiduguri is achievable, but only with an open-mind, patience, and a dogged approach to existing systematic issues.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

References

[1] Leidman, E., Tromble, E., Yermina, A., Johnston, R., Isokpunwu, C., Adeniran, A. and Bulti, A. (2017) Acute Malnutrition among Children, Mortality, and Humanitarian Interventions in Conflict-Affected Regions—Nigeria, October 2016-March 2017. *Morbidity and Mortality Weekly Report* (*MMWR*), **66**, 1332-1335. https://doi.org/10.15585/mmwr.mm6648a4

[2] Dunn, G. (2018) The Impact of the Boko Haram Insurgency in Northeast Nigeria on Childhood Wasting: A Double-Difference Study. *Conflict and Health*, **12**, Article No. 6. https://doi.org/10.1186/s13031-018-0136-2

[3] MSF SAM Guideline (2014). https://www.publichealthnotes.com/similarities-and-differences-between-rutf-and-rusf/

[4] Deconinck, H., Hallarou, E.M., Pesonen, A., Gerard, C.J., Criel, B., Donnen, P. and Macq, J. (2016) Understanding Factors that Influence the Integration of Acute Malnutrition Interventions into the National Health System in Niger. *Health Policy and Planning*, **31**, 1364-1373. https://doi.org/10.1093/heapol/czw073

[5] Hersch-Martínez, P. and Pisanty-Alatorre, J. (2016) Chronic Undernourishment in School-Aged Children: Itineraries of Nutritional Neglect and Official Programs in Indigenous Communities of Guerrero, Mexico. *Salud Colectiva*, **12**, 551-573. https://doi.org/10.18294/sc.2016.917

[6] Rieger, M. and Wagner, N. (2015) Child Health, Its Dynamic Interaction with Nutrition and Health Memory—Evidence from Senegal. *Economics and Health Biology*, **16**, 135-145. https://doi.org/10.1016/j.ehb.2014.03.001

[7] Hankard, R., Columbus, V., Piloquet, H., Bocquet, J.L., Briend, A., Chouraqui, J.P., Darmaun, D., Dupout, C., Frelut, M.L., Girardet, J.P., Goulet, O., Rieu, D., Simeoni, U., Turck, D. and Vidailhet, M. (2012) Malnutrition Screening in Clinical Practice. *Archives de Pédiatrie*, **19**, 1110-1117. https://doi.org/10.1016/j.arcped.2012.07.024

[8] Pandolfi, M.M., Sandmini, F., Rocco de Oliveira, M., Armond, J.E., Zollner, A.C.R., Juliano, T. and Souza, P.C. (2011) Malnutrition in School Children in an Urban-Rural Region of the Extreme South of São Paulo City. *Einstein* (*São Paulo*), **9**, 508-513. https://doi.org/10.1590/s1679-45082011ao2045

[9] Dearth-Wesley, T., Wang, H. and Popkin, B.M. (2008) Under- and Overnutrition Dynamics in Chinese Children and Adults (1991-2004). *European Journal of Clinical Nutrition*, **62**, 1302-1307. https://www.nature.com/articles/1602853

[10] Borno State Government (2007) About Borno State. Office Memo File.

[11] Nigerian Metrological Association (NMA) (2008) Annual Situation Report, 2008.

[12] Nigerian Population Commission (2009) Population Census 2006 Final Report. https://gazettes.africa/archive/ng/2009/ng-government-gazette-dated-2009-02-02-no-2.pdf

[13] Borno State Agricultural Development (BOSADP) (2008) Office Memo File.

[14] Tadesse, E., Berhane, Y., Hjern, A., Olsson, P. and Ekström, E.C. (2015) Perceptions of Usage and Unintended Consequences of Provision of Ready-to-Use Therapeutic Food for Management of Severe Acute Child Malnutrition. A Qualitative Study in Southern Ethiopia. *Health Policy and Planning*, **30**, 1334-1341. https://doi.org/10.1093/heapol/czv003

[15] World Health Organization (2004) Promoting Proper Feeding for Infants and Young Children. World Health Organization, Geneva. https://www.who.int/data/nutrition/nlis/info/infant-and-young-child-feeding

[16] Hop, L.T., Gross, R., Giay, T., Sastroamidjojo, S., Schultink, W. and Lang, T.N. (2000) Premature Complementary Feeding Is Associated with Poorer Growth of Vietnamese Children. *The Journal of Nutrition*, **130**, 2683-2690. https://doi.org/10.1093/jn/130.11.2683

[17] WHO (2012) Trends in Maternal Mortality: 1990-2010: UNICEF UNFPA and World Bank Estimates. http://apps.who.int/iris/bitstream/handle/10665/44874/9789241503631_eng.pdf;jsessionid=4D060D7AF2D9F1C022DCBC6E6CC7DF10?sequence=1

[18] Shaikh, B.T. and Hatcher, J. (2005) Health Seeking Behaviour and Health Service Utilization in Pakistan: Challenging the Policy Makers. *Journal of Public Health*, **27**, 49-54. https://doi.org/10.1093/pubmed/fdh207

[19] Durosaro, I.B. (2016) Patriarchal Attitudes: Counseling as an Effective Intervention. The Library and Publications Committee University of Ilorin, Ilorin. https://www.unilorin.edu.ng/UIL/164.pdf

[20] McAlister, C. and Baskett, T.F. (2006) Female Education and Maternal Mortality: A Worldwide Survey. *Journal of Obstetrics and Gynaecology Canada*, **28**, 983-990. https://doi.org/10.1016/S1701-2163(16)32294-0

[21] Maswikwa, B., Richter, L., Kaufman, J. and Nandi, A. (2015) Minimum Marriage Age Laws and the Prevalence of Child Marriage and Adolescent Birth: Evidence from Sub-Saharan Africa. *International Perspectives on Sexual and Reproductive Health*, **41**, 58-68. https://doi.org/10.1363/4105815

[22] Nour, N.M. (2009) Child Marriage: A Silent Health and Human Rights Issue. *Reviews in Obstetrics and Gynecology*, **2**, 51-56.

[23] Nour, N.M. (2006) Health Consequences of Child Marriages in Africa. *Emerging Infectious Diseases*, **12**, 1644-1649.

[24] Anita, R., Saggurti, N., Winter, M., Labonte, A., Decker, R.M., Balaiah, D. and Silverman, J.G. (2010) The Effect of Maternal Child Marriage on Morbidity and Mortality of Children under 5 in India: Cross Sectional Study of a Nationally Representative Sample. *British Medical Journal*, **340**, b4258. https://doi.org/10.1136/bmj.b4258

[25] Weiss, I., Bensen, T., Cotes, G. and Du, L. (2018) Assessing Drivers of Malnutrition in Nigeria: Results of a Multi-Sectoral Assessment Informing USAID Nigeria's Global Food Security Strategy. U.S. Agency for International Development (USAID), Washington DC. https://www.spring-nutrition.org/sites/default/files/assessing_drivers_of_malnutrition_in_nigeria.pdf

[26] Frankenberger, T.R., Constas, M.A., Nelson, S. and Starr, L. (2014) Current Approaches to Resilience Programming among Nongovernmental Organizations. International Food Policy Research Institute (IFPRI), Washington DC. https://www.preventionweb.net/publications/view/37465

[27] Niles, M.T. and Salerno, J.D. (2018) A Cross-Country Analysis of Climate Shocks and Smallholder Food Insecurity. *PLOS ONE*, **13**, e0192928. https://doi.org/10.1371/journal.pone.0192928

[28] Akintoye, A., Beck, M. and Hardcastle, C. (2003) Public-Private Partnerships: Managing Risks and Opportunities. John Wiley & Sons, Hoboken, 9-20. https://doi.org/10.1002/9780470690703

[29] Steg, L. and Vlek, C. (2009) Encouraging Pro-Environmental Behaviour: An Integrative Review and Research Agenda. *Journal of Environmental Psychology*, **29**, 309-317. https://doi.org/10.1016/j.jenvp.2008.10.004

[30] Armitage, C.J. and Conner, M. (2001) Efficacy of the Theory of Planned Behaviour:

A Meta-Analytic Review. *British Journal of Sociology*, **40**, 471-499. https://doi.org/10.1348/014466601164939

[31] https://www.unilever.com/sustainable-living/enhancing-livelihoods/opportunities-for-women/

[32] USAID Nigeria (2013). https://pdf.usaid.gov/pdf_docs/PA00W9XX.pdf

[33] Kinmonth, A.L., Wareham, J.N., Hardeman, W., Sutton, S., Prevost, T., Fanshawe, T., Williams, K.M., Ekelund, E., Spiegelhalter, D. and Griffin, S.J. (2008) Efficacy of a Theory-Based Behavioural Intervention to Increase Physical Activity in an At-Risk Group in Primary Care (ProActive UK): A Randomised Trial. *The Lancet*, **371**, 41-48. https://doi.org/10.1016/S0140-6736(08)60070-7

[34] Christiaensen, L. and Alderman, H. (2004) Child Malnutrition in Ethiopia: Can Maternal Knowledge Augment the Role of Income? *Economic Development and Cultural Change*, **52**, 287-312. https://doi.org/10.1086/380822