

AN ASSESSMENT OF THE CAUSES, EFFECTS AND REMEDY FOR MALNUTRITION IN UNDER-FIVE CHILDREN IN BARKIN LADI LGA, PLATEAU STATE, NIGERIA

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Abstract

Malnutrition is identified as one of the utmost significant universal health problems, and it affects a large number of children in developing countries including Nigeria. This study investigated the public health implications of malnutrition in under-five children in Barkin Ladi Local Government Area of Plateau State. The works of prominent authors were reviewed in line with the stated objectives. Data were collected both qualitatively and quantitatively using multistage cluster sampling technique to select the communities. Seven villages were randomly selected through balloting and clusters of 93 centers were selected from the seven villages. This study identified risk factors including poor hygiene, diet-related non-communicable diseases, and mortality to be significantly higher in children with malnutrition compared to normal children. The study also found that the educational and economic status of the parents correlated with the nutritional status of the children. The study recommends family planning education, improved provision of infrastructural facilities to rural communities, as well as economic empowerment and provision of security of lives and properties as remedies for the identified challenges.

Keywords: Family planning; Malnutrition; Mortality; Poor hygiene; Under-five children;

Introduction

Malnutrition is one of the utmost significant universal public health problems, and it affects a large number of children in developing countries (Ansuya, Nayak, & Guddattu, 2018).). The UNICEF (2020), indicated that Nigeria has the second highest burden of stunted children in the world, with a prevalence rate of 32% of children under five. It is a well-known fact that the nutritional status of children is one of the major indicators of the economic development of a nation. Economic growth is considered as one of the important indicators for assessment of nutritional status. It is measured as weight-for-age, weight for height and height for age indices. The common nutritional status of children under 5 years old in every country such as underweight, stunting and wasting are considered as nutritional disorders, while the evaluation of these criteria reflects the general health status of that country (Govender, Rangiah, & Kaswa, 2021))

Proper nutrition of children is identified as leading to adequate growth and good health is the essential foundation of human development. However, the world Health Organization states that malnutrition in all its forms includes under nutrition (wasting, stunting, and underweight) inadequate vitamins or minerals, overweight, obesity, and resultant diet-related non-communicable diseases. Ghosh (2020), identified insufficient diet, frequent infections, poor breastfeeding practices, delayed introduction of complementary food and inadequate protein in diet as the causes of childhood malnutrition. Other factors that influence food intake include health status, food taboos, growth and personal choice related to diet. According to a 2018 UNICEF report, Nigeria has the second highest burden of stunted children in the world, with a national prevalence rate of 32 percent of children under five. An estimated 2 million children in Nigeria suffer from severe acute malnutrition (SAM), but only two out of every 10 children affected are currently reached with treatment. Seven percent of women of childbearing age also suffer from acute malnutrition.

The World Health Organization report (2014) shows that approximately 426 million adults worldwide were underweight, while 1.9 billion were either overweight or obese. In 2016, an estimated 155 million children under the age of five-years were suffering from stunting, while 41 million were overweight or obese. The report also indicated that around 45% of deaths among children under-five years of age are linked to under nutrition. These mostly occur in low and middle-income countries. At the same time, in these same countries, rates of childhood overweight and obesity are rising.

In responding to the challenges of malnutrition, the United Nations (UN) General Assembly on April 1, 2016, proclaimed 2016-2025 as the United Nations Decade of Action on

Nutrition, which set a timeline for implementation of the commitments made at the Second International Conference on Nutrition (ICN2) to meet a set of global nutrition targets and diet related NCD targets by 2025, as well as relevant targets in the Agenda for Sustainable Development Goals (SDGs) to end hunger, achieve food security and improved nutrition and promote sustainable agriculture (Tasnim, 2018). Similarly, the World Health Organization 2016-2025 nutrition strategy aimed at working together with Member States and partners towards universal access to effective nutrition interventions and to healthy diets from sustainable and resilient food system (WHO, 2020).

The alarming rate of malnutrition in Nigeria can be attributed to many factors among which are, high rate of unemployment, poor infrastructural facilities, insurgency and ethno-religious violence, as well as economic instability. However, the importance of malnutrition, regardless of its cause is due to its consequences, because it causes skin rashes, hair loss, impaired immune response and susceptibility to infections, digestive problems, night blindness, impaired wound healing and a change in emotional behavior (Taheri, *et al*, 2006). On the other hand, the height and weight measurements are of important information sources for assessment of growth and nutritional status. Malnutrition can be detected in early stages before clinical symptoms by anthropometric measurements to provide suitable solutions according to the degree of malnutrition. This paper assesses the causes, effects and remedy for malnutrition in under-five children in Barkin Ladi Local Government Area of Plateau State, Nigeria

Statement of the Research Problem

Malnutrition among children aged below five years is a serious public health problem in developing countries, particularly in Africa and Asia regions (Tasnim, 2018). Malnutrition can increase the risk of both morbidity and mortality in children under five years old. Statistics have shown that about 54% of deaths among children under five years old are caused by malnutrition (Zhang, *et al*, 2022). Malnutrition in early childhood can also increase impaired psychological and intellectual development. The disturbance in both psychological and intellectual development can lead to low school performance and behavioral disturbance. Furthermore, malnutrition in early childhood is often associated with low individual's economic productivity that leads to social and economic deprivation. It prevents children from reaching their full physical and mental potentials.

Health and physical consequences of prolonged states of malnourishment among children are delay in physical growth and motor development; lower intellectual quotient (IQ), greater behavioural problems and deficient social skills and susceptibility to contracting diseases

(Kandala, Tumwaka, Jacques, Kikhela, and Francesco, 2011). Furthermore, child malnutrition is associated with approximately 60 percent of under-five mortality in developing nations including Nigeria. The majority of studies on child nutritional status have described prevalence of malnutrition among under-five children and analyzed socioeconomic, demographic and cultural factors associated with child malnutrition.

In spite of efforts to tack the menace of malnutrition and the constant ongoing enlightenment on the need for proper nutrition in early stages of a child's life, the spate of malnutrition has continued to increase in Nigeria, especially in the rural areas and the Northeastern part of the country. Malnutrition is estimated to contribute to more than one third of all child death, although it is rarely listed as the direct cause. Lack of access to highly nutritious foods, especially in the present context of rising food prices is a common cause of malnutrition (UNICEF, 2020). Poor feeding practices such as inadequate breastfeeding, offering the wrong foods, and not ensuring that the child gets enough nutritious food, contribute to malnutrition. Infection particularly frequent or persistent diarrhea, pneumonia, measles and malaria also undermines a child's nutritional status.

Studies over the years including the World Bank reports (2003), UNICEF reports (2020), WHO (2020) stated that malnutrition makes children in particular much more vulnerable to disease and death. Tasnim, (2018) further stated that health inequities in developing countries are caused by unequal distribution in income, power, goods and services. This condition leads to unfairness in accessibility of health care, education and employment. Therefore, children under five in lower socioeconomic positions often have worse nutritional status than those in higher socioeconomic position (Tasnim, 2018). In Nigeria, economic and political instability are also identified as some of the major causes of malnutrition in children as well as adults.

It is against this backdrop that this study investigates the causes and effects of malnutrition among children with the primary aim of recommending solutions to reduce the increasing rate of child mortality rate in Barkin Ladi Local Government Area of Plateau State, Nigeria.

Objectives of the Study

- i. To identify the causes of malnutrition in under-five children in Barkin Ladi Local Government Area of Plateau State.
- ii. To identify the public health implications of malnutrition in under-five children in Barkin Ladi Local Government Area of Plateau State.

- iii. To suggest remedies that will help to reduce the prevalence of malnutrition in under-five children in Barkin Ladi Local Government Area of Plateau State.

Materials and Methods

The study is a Community-Based Case-control, conducted in Barkin Ladi Local Government Area of Plateau State Nigeria. Survey questionnaires were used to gather data from the selected mothers in the study area. In addition, the service of a research assistant was employed to translate the research tools to the local Birom language which was then re-translated to English to check the language validity. The study was conducted among the sample of children between three to five years, in Barkin Ladi and their mothers.

A Survey was carried out to identify the children with malnutrition. Multistage cluster sampling technique was adopted to select the communities. Seven villages were randomly selected by balloting (i.e. Foron, Ropp, Gana, Werei, Fan, Kassa and Dogo na Hauwa). Clusters of 93 Centers were selected from the seven villages. A total of 1485 children were assessed for nutritional status from 93 selected centers. Among these 1485 children, and 362 were identified as malnourished based on World Health Organization (2006) child growth standards (weight for age).

The control group was selected based on 1:2 ratios. Thus, a sample of 190 cases and 380 controls were included in the study. For each case of malnourished child identified, two normal weight children (controls), who met the inclusion criteria were selected.

Measurement of weight of the preschool children was done to identify the malnourished children. The nutritional status was graded as per the World Health Organization 2006 child growth standards. Children in the age group of 3–5 years, with weight for age ratio less than -2 SD ($-2Z$ Scores) and not suffering from any chronic illness were considered a case. Controls were healthy children in the same age group with weight for age ratio above -2 SD ($>-2Z$ scores).

Ethical Consideration

Approval for carrying out the research was obtained from the Plateau State Ministry of Health. All participants were provided with clear information and asked if they would be willing to participate or not. Only those who were willing to participate were involved and written consent was obtained. All information obtained for the study was treated with utmost confidentiality and the names of the respondents were not required in order to ensure anonymity.

Results

Table 1: Demographic Characteristics of the Participants

Demographic characteristics	Cases N=190 (%)	Controls N=380 (%)
Age in years		
Less than 1 year	40 (21.1)	87 (22.8)
1 year	31 (16.1)	138 (36.3)
2 years	44 (24.4)	69 (18.2)
3 years	32 (16.5)	43 (11.0)
4 years	43(24.0)	41 (10.0)
Sex		
Male	85 (44.7)	184 (48.4)
Female	105 (55.3)	196 (51.6)
Type of Family		
Nuclear	110 (57.9)	214 (56.3)
Extended	80 (42.1)	166 (43.7)
Highest Level of Education of Father		
Primary	55 (28.9)	297 (78.2)
Secondary	95 (50.0)	83 (21.9)
Tertiary	40 (21.1)	166 (43.7)
Highest Level of Education of Mother		
Primary	10 (5.3)	297 (78.2)
Secondary	150 (78.9)	83 (21.9)
Tertiary	30 (15.8)	166 (43.7)

Source: Field Survey (2024)

Table 1. shows that majority of children Cases n=110 (57.9%) were from nuclear family, while Controls n=214 (56.3%) signifies that type of family has no much influence on child nutritional status as there is no much difference between these group of children. However, the father's educational status has influence on the child's nutritional status as presented in Table 1. This can be attributed to the fact that children whose fathers are educated are more likely to be employed and have high socio-economic status as compared to fathers who are primary school certificate holders.

Further investigation of this study found between malnutrition and immunization status of the child as well as the educational status of mother (χ^2 (df) =15.8(3), $p<0.001$) and the father (χ^2 (df) =22.2(3), $p<0.001$). A child's risk of malnutrition was higher when he/she was partially immunized, as compared to a child who was completely immunized OR 2.31, 95% CI (1.58–3.36) $p<0.001$]. The Child related risk factors presented in Table 2 indicate that children with birth weight less than 2000g were 1.9 times, and those between 2000 and 2500g were 3.9 times at a higher risk of being malnourished, as compared to children with birth weight more than

2500g. Second and third birth order children were 3.8 times and 2.7 times higher risk of being malnourished as compared to the firstborn. The study also found that the birth interval between the first and the second child and between the second and the third child, if less than 3 years, had a high risk of malnutrition ($p<0.001$).

Table 2: Child Illness Factors and Malnutrition

Childs Illness Factors	Cases N=190 (%)	Controls N=380 (%)
Cold and cough	85 (44.7)	184 (48.4)
	105 (55.3)	196 (51.6)
Typhoid malaria	190 (100.0)	380 (100.0)
	000 (100.0)	000 (100.0)
Diarrhea	110 (57.9)	214 (56.3)
	80 (42.1)	166 (43.7)
Stunning and wasting	55 (28.9)	297 (78.2)
	95 (50.0)	83 (21.9)
	40 (21.1)	166 (43.7)
Respiratory infections	10 (5.3)	297 (78.2)
	150 (78.9)	83 (21.9)
	30 (15.8)	166 (43.7)

Source: Field Survey (2024)

As shown in Table 2 a malnourished child was noted to have 6.9 times higher risk of having suffered from recurrent cold and cough, and 10 times the risk of having recurrent diarrhea in the previous year. In addition, a malnourished child has 4.6 times and 6.8 times higher risk of having suffered from worm infestation and poor appetite respectively.

The findings of this study revealed that environmental risk factors (water and sanitation characteristics) and children practicing open defecation were more among cases (14.7%) than in controls (6.8%), and they also tend to have a 2.3 times higher risk of being malnourished, compared to children using a sanitary latrine 95%CI (1.37– 4.14), $p=0.002$. Children whose families had open drainage system around the house were noted to be more in cases (74.7%) than controls (58.2%), and were at 2.0 times at a higher risk of being malnourished than families that had underground and piped drainage system 95%CI (1.329–3.29), $p<0.001$.

Factors such as a source of water and method of water storage in the house did not have any association with malnutrition, but the method of accessing the drinking water (for example, immersing both the glass and the hand into the stored water) by the children had significant association with malnutrition. Children who had the habit of immersing both hand and glass to access drinking water, and children who had the habit of immersing only the glass and not their hand, were noted to be more in cases compared to controls. They had 4.7 times 95%CI 2.02–

11.05, $p < 0.001$ and 7.25 times 95%CI: 3.00–17.49, $p < 0.001$ higher risk, respectively, of being malnourished compared to children using a long spoon to extract drinking water from a stored vessel.

Discussion

Findings from the study revealed that the nutritional status of children under the age of five is affected by different factors including poor hygiene, diet-related non-communicable diseases, mortality, impaired immune response and susceptibility to infections, digestive problems, night blindness, impaired wound healing and a change in emotional behaviour among others. Certain risk factor such as diarrhea, pneumonia, measles and malaria were found to be significantly higher in children with malnutrition compared to normal children. Educational and socioeconomic status of the parents was associated with the nutritional status of the child. The socio-economic status of the family was independently associated with under-nutrition as the study populations were from rural areas. Hence, in richer households, children are often well fed and cared for, through which they are more likely to survive, to have fewer diseases and illnesses, and to fully develop thinking, language, emotional and social skills (UNICEF, 2007).

However, in poorer households, most children are affected by the resurgence of kwashiorkor due to lack of adequate proteins in the diet leading to other related illnesses. This is certainly due to the increasing poverty level among parents who cannot afford to buy proteineous food such as groundnuts, beans, meat, fish, and milk for their children.

The World Health Organization (2009) maintained that adequate nutrition during infancy and early childhood is essential to ensure the growth, health and development of children to their full potential and recommended that, for achieving optimum growth, development and health, a child should be breast fed exclusively during the first six months of life. To evolve as a healthy individual, the infant should be continued with adequate and appropriate safe complimentary food along with breast milk up to two years of age or beyond.

The study found that stunting prevalence between children from uneducated mothers or those whose mothers have a primary school level of education compared with those from mothers with secondary or high level of education remains high. In fact, education could make a lot of difference by empowering mothers with capacity to decide on type of nutrition and/or use of preventive medicine. Education could also help the mothers make informed nutritional decisions about cultural norms on certain types of food for children. With reference to other variables, male children seem to be more exposed to the risk of malnutrition than female children are. There is however no obvious explanation for this gender difference.

Similarly, older children are more prone to anthropometric failure than their counterparts aged less than one are, mainly because older children are mixed breastfed, even not breastfed at times, while younger children may be protected by the mother's immune system at birth (Kandala, Fahrmeir, Klasen & Priebe, 2009). The risk could be also due to lack of food in the households due to poverty or non-observance of hygiene by mothers, when cooking children's foods. The direct causes of malnutrition are the lack of access to drinking water in Barkin Ladi Local Government Area of Plateau State are, morbidity (malaria, respiratory infections and diarrhea) and poor food consumption.

Conclusion

Evidence has shown that under nutrition is one of the utmost significant universal public health problems, and it affects a large number of children in developing countries including Nigeria, hence, it should be given top priority. This study has been able to determine that childhood malnutrition is spatially structured and its rates remain very high in Barkin Ladi because it is a rural settlement and most of the populace were unemployed with little or no access to basic social amenities including good drinking water, electricity, schools and medical facilities. The study concludes that improvement of the nutritional status of children would help avert child related deaths from diarrhea, pneumonia, malaria, HIV and measles. Consequently, it would reduce neonatal mortality, helping to achieve both the Millennium Development and Sustainable Development Goals, whose main aim is to reduce poverty and hunger.

Recommendations

- i. There is an urgent need for national policies to improve the security of people and implement agricultural policies for auto-dependent agriculture. In other words, improving maternal and child nutrition is a prerequisite for achieving MDGs, to reduce the child mortality rate.
- ii. In addition, nutritional programmes and policies that will try to reduce female illiteracy and provide basic infrastructures in rural areas in order to reduce gaps in health care between socio-economic groups are likely to succeed.
- iii. The majority of the poorest household lives in rural areas and poorest children are more exposed to the risk of being malnourished. Hence, there is an urgent need to build programmes that aim to reduce poverty in both rural and urban areas.

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