



Original

## Assessment of caregivers' knowledge of causes and strategies for reducing malnutrition in children zero to five years in Samaru community, Sabon-Gari Local Government, Kaduna state, Nigeria

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### Abstract

**Background:** There is a high prevalence of malnutrition with negative consequences among children 0-5 years. The caregivers' knowledge of causes and strategies for reducing malnutrition in children zero to five years old in the Samaru community was assessed.

**Method:** A descriptive cross sectional study design with 320 mothers and caregivers of children from zero to five years residing in the five areas of Samaru community. A semi-structured questionnaire was used to collect information including socio-demographics, causes, and strategies for reducing malnutrition. The data was analyzed using Statistical Package for Social Sciences (SPSS) version 26 at  $p < 0.05$ . Ethical approval was obtained from research and ethics committee, Kaduna state University.

**Results:** The majority of the patients were  $< 35$  years of age (56.6%), Muslims (53.1%), below the tertiary level of education (84.4%), currently employed (53.1%), and currently married (87.5%). They mostly have  $\leq 4$  children (73.4%), males (59.4%), aged above 1 year (65.9%). The majority have good knowledge of the causes of malnutrition (mean = 2.62), factors influencing the prevalence of malnutrition (mean = 2.76), and a satisfactory level of knowledge on the strategy of reducing malnutrition (mean = 3.66).

**Conclusion:** The nutritional status of under-fives in Nigerian communities is low despite adequate knowledge of the majority of the carers on the causes and strategies for reducing malnutrition. There is a need for the development of policies and programs to ensure proper implementation of programs and services aimed at reducing the prevalence and menace of malnutrition.

**Keywords:** Assessment, Children Zero to Five Years, causes, strategies, malnutrition, Sabon-Gari Local Government, Kaduna state



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## Introduction

Malnutrition encompasses deficiencies or overabundances in nutrient consumption, an imbalance of vital nutrients, or impaired nutrient utilization.<sup>1</sup> Malnutrition manifests as a disparity between the nutrients necessary for your body to operate;<sup>2</sup> this can manifest as undernourishment, such as: Macronutrients deficiencies (protein, carbohydrate and Fats) and Micronutrient deficiencies including, vitamins and minerals such as iron, zinc, magnesium, sodium etc.<sup>3</sup> These affect normal childhood growth and development by interfering with important metabolic processes in the body like red cell production, glucose metabolism, hormones and other necessary substrate production.<sup>4,5</sup>

The causes of nutritional deprivation are diverse and interconnected, involving biological, social, cultural, and economic factors that influence children at various levels, from the individual to the national level.<sup>6</sup> The Household Deprivation Score (HDS) for children is a simple measure based on three dimensions: economic assets, amenities, and communication with the outside world. Diarrhea, maternal infections, parasitic infestation, childhood chronic illnesses like HIV and diseases such as measles etc are all causes of malnutrition.<sup>6</sup> Other factors such as: maternal literacy, low household income, larger family size, limited access to media, inadequate diet supplementation, and poor water and sanitation hygiene as linked to chronic and severe malnutrition in children.<sup>7</sup>

According to the World Health Organization (WHO) in 2023, malnutrition contributes to 54% of child deaths worldwide, affecting approximately one million children.<sup>1</sup> Strategies for reducing malnutrition occurs at different levels; Primary strategies (involve health promotion and education on proper nutrition and food hygiene, food supplementation with zinc, vitamin A etc), Secondary strategies (focus on providing adequate treatment, implementing regular nutritional surveillance) and tertiary strategies (encompass nutritional rehabilitation services, hospital-based treatments, follow-up care, and increased government budget allocation for agriculture and health ministries etc). Nutritional education and fortified food supplements have resulted in a 10% reduction in stunting among children aged 12-36 months, while milk fortified with zinc and iron has lowered the incidence of diarrhea and malnutrition by 18% in children.<sup>8</sup>

Children who experience undernourishment before age two but then gain weight rapidly later in life are at a heightened risk of chronic nutrition-related illnesses.<sup>9</sup>

There was strong link between malnutrition and increased mortality especially from respiratory infections, diarrhea, and malaria, with severe malnutrition amplifying these risks.<sup>9</sup> Undernourished girls are prone to become short adults and are more likely to have small children.<sup>10</sup> More so, long term implications of malnutrition were identified such as: low birth weight and impaired cognition.<sup>11</sup> Malnutrition rates are highest among the poorest quintile of children globally.<sup>12</sup> The prevalence of malnutrition was found to be higher in low-income countries (36 percent) compared to middle-income countries (12 percent) and the United States (1 percent).<sup>12,13</sup>

Approximately 970,000 children under the age of five in West Africa's Sahel countries (Burkina Faso, Mali, Niger) are expected to experience severe malnutrition this year due to challenges such as; increased prices, conflicts, and climate change impacting their families.<sup>14</sup> The ongoing conflict in Nigeria's Northeast Region continues to have a significant negative impact on the well-being of children, pregnant women, and breastfeeding mothers.<sup>15</sup> Additionally, incidents of banditry and kidnapping in states like Katsina, Sokoto, Kaduna, Benue, and Niger have restricted food access due to ongoing violence.<sup>14,15</sup>

According to UNICEF's 2023 report, Nigeria ranks second globally in terms of the number of children affected by stunted growth.<sup>14</sup> Specifically, there are two million children experiencing severe acute malnutrition (SAM), with stunting and wasting being particularly widespread in Northern Nigeria, including Kaduna State. Stunting not only heightens the risk of mortality but is also linked to delayed cognitive development, lower academic achievement, and reduced adult productivity.<sup>14,15</sup>

However, despite the identified increasing prevalence and the accompanying negative consequences of malnutrition, there is limited research into the causes of malnutrition and effective strategies to combat it in the Samaru community, located in Sabon-Gari local government area of Kaduna State. This underscores the need for a comprehensive study titled "Assessment of Causes and Strategies for Reducing Malnutrition in Children Aged Zero to Five Years in Samaru Community, Sabon-Gari Local Government, Kaduna State, Nigeria."

## Method

### Research Design

A descriptive cross-sectional study was used to assess the causes and strategies for reducing malnutrition in children from zero to five years in Samaru Community, Sabon Gari, Zaria, Kaduna State.

### Study area

The study was carried out in Samaru, Zaria, Sabon-Gari local government area of Kaduna state, Northwest Nigeria with a population of about 54,000. It is situated on latitude 11°12' N and longitude 07°37' E at an altitude of 700m. It lies within the Northern Guinea Savannah zone and the climate zone is characterized by a dry season of 7 months duration from mid-October to mid-May and a wet season of 5 months from June to October with an annual rainfall of 1099.34mm. The soil is mainly accumulated clay lying between a depth of 36cm and 119cm. Samaru-Zaria is a semi-urban University satellite town that comprises of many streets separated by minor roads, it is endowed with abundant basic amenities for survival, job opportunities and the generation of economic prosperity for the peasants and mobile men of the neighboring villages. Samaru community is made up of different ethnic and religious groups, but the most predominantly ethnic groups are the Hausa/Fulani who are mainly Muslim. The community has primary, secondary, and tertiary institutions and a host of commercial activities.<sup>15,16</sup>

### Study population

The population for this study consists of mothers/caregivers of children from zero to five years in Samaru community, Sabon-Gari, Zaria Kaduna state.

### Sample Size

The sample size was calculated using the formula below given the population size of Samaru was more than 10,000

$$n = \frac{Z^2pq}{d^2}$$

Where n = minimum sample size required;  
Z= standard deviate given as 1.96; P = prevalence of malnutrition from previous study found as 61% = 0.61<sup>18</sup>, q= 1-p = 31% = 0.31

d = degree of accuracy 0.05 at 95% confidence interval  
n = 365.56

Using 10% attrition rate, n = 402.

### Sampling technique

A convenient sampling technique was used to consecutively recruit mothers/caregivers of children 0-5 years, who consented for the study. Equal number of participants were recruited from the five different areas

of residence in the community. Relevant information including the socio-demographic characteristics, causes and strategies for reducing malnutrition was obtained using the semi-structured questionnaire until the appropriate sample size obtained.

### Instrument for Data Collection

The researcher developed a semi-structured questionnaire based on the objectives of the study which was subjected to face and content validity by three other experts in the field of nutrition and a test-retest reliability to ascertain reliability which yields 0.268 and 0.438 coefficient of variation by using Pearson Product Moment Correlation analysis. The reliability co-efficient showed that the instrument is fairly accurate and stable.

### Method of data collection

The data was collected with the help of five trained research assistants. It was self-administered by the literate women while the non-literate women were interviewed using the questionnaire. The women were visited in their homes.

### Method of data analysis

The data was entered into the statistical package for social science version 26. It was cleaned and those incompletely filled questionnaires discarded. The Likert scale was used to code and allocate points to the data collected for easy analysis. Strongly agree (4 points), agree (3 points), disagree (2 points), and strongly disagree (1 point).

The total score in the Likert scale were obtained by multiplying the frequency of each response option by it corresponding to the Likert scale.

$$\text{Total score} = \sum (f_i * \text{Likert scale score})$$

Where?

F = frequency of each Likert scale score

I=Likert scale score

X=The Likert means score was determined by dividing the total scores by the total number of respondents.

$$\sum f_i / n$$

Where:

$\sum$  = sum

$f_i$  = frequency of each response

n = number of respondents

$$\sum x/n = 4+3+2+1/4 = 2.5$$

Where:

$\sum x$  = sum

n= number

### Ranking of strategies for reducing Malnutrition in children

Means value	Rank
< 2.5	Poor

2.5 - 3.8 Satisfactory  
> 3.8 Good

**Ethical Consideration**

Ethical clearance was obtained from Research Ethics Committee, Kaduna state university. Permission to carry out the study was obtained from the chairman Sabon-Gari local government and the village head of Samaru community. Similarly informed consent was obtained from the respondents and confidentiality was ensured.

**Results**

A response rate of 80% was gotten for the study. Out of the total number of 320 mothers/caregivers that responded, majority were < 35 years of age 181 (56.6%), Muslims 170 (53.1%), with below tertiary level of education 270 (84.4%), currently employed 170 (53.1%) and currently married 280 (87.5%). They mostly have ≤ 4 children 235 (73.4%), mostly males 190 (59.4%), aged above 1 year 211 (65.9%). Equal number of respondents 64 (20%) was gotten from each of the five settlements in the community **table 1**. Majority of respondents have good knowledge of the causes of malnutrition with an aggregate mean of score of 2.62; with inadequate healthcare services having the highest mean of 2.84 **table 2**. More so, there was good knowledge of the factors influencing the prevalence of malnutrition in with an aggregate mean score of 2.78; inadequate knowledge about appropriate complimentary feeding practices and lack of awareness about proper infants and child nutrition having the highest mean of 3.5 and 3.4 respectively **table 3**. There was also good level of strategy of reducing malnutrition in children 0-5 years in Samaru Community, with mean aggregate of 3.66 offering free or subsidized nutrition meals to schools and day cares center and providing regular growth monitoring and nutritional assessment for children contributing to reduction of malnutrition in children having the highest mean of 3.8 **table 4**.

**Table 1:** Socio-demographic characteristics and clinical variables of the respondents (N=320)

Variables	Freq	Percent
<b>Age (Years)</b>		
< 35	181	56.6
≥ 35	139	43.4
<b>Religion</b>		
Islam	170	53.1
Christianity	150	46.9
<b>Level of education</b>		
Below tertiary	270	84.4
Tertiary	50	15.6
<b>Occupation</b>		
Currently employed	170	53.1
Not currently employed	150	46.9
<b>Marital status</b>		
Currently married	280	87.5
Not currently married	40	12.5
<b>Number of children per respondents</b>		
≤ 4	235	73.4
>4	85	26.6
<b>Age range of children</b>		
0-1	109	34.1
>1	211	65.9
<b>Gender of children</b>		
Male	190	59.4
Female	130	40.6
<b>Area of Residence</b>		
Anguwan Fulani	64	20.0
Anguwan Zango	64	20.0
Dogon ice	64	20.0
Hayin danyaro	64	20.0
Danranka	64	20.0

**Table 2:** Causes of malnutrition

Statement	Mean	SD
Lack of access to nutrition food	2.58	1.11682
Insufficient knowledge of proper nutrition	2.70	.98133
Inadequate Healthcare services	2.84	.74882
Poor sanitation and hygiene practices	2.44	1.13782
Limited financial resource	2.54	.79059

Aggregate mean= 2.62

**Table 3:** Factors influencing the prevalence of malnutrition in children 0-5 years in Samaru community

Statement	Mean	SD
Lack of awareness about proper infants and child nutrition contributes to malnutrition	3.40	1.12397
Limited access to nutritious food in Samaru community leads to higher rates of malnutrition	1.9	0.63344
Poverty and economic constraint in Samaru Community contributes to malnutrition in children	3.2	1.255505
Insufficient breastfeeding practice in Samaru contributes to malnutrition among infants	1.90	0.68572
Inadequate knowledge about appropriate complimentary feeding practices leads to malnutrition.	3.5	1.04966

Aggregate means=2.78

**Table 4:** Perceived Strategies for reducing malnutrition in children 0-5 years in Samaru Community

Statement	Mean	SD
Providing nutrition education to parents and caregivers is an effective strategy for reducing malnutrition in children	3.70	0.47244
Implementing community-based nutrition program can help address malnutrition in children	3.8	0.47508
Increasing access to nutritious food through local markets and food suppliers is essential for reducing malnutrition in children	3.33	1.17295
Offering free or subsidized nutrition meals to schools and day cares center can contribute to reducing malnutrition in children.	3.81	0.41428
Providing regular growth monitoring and nutritional assessment for children can help identify and address malnutrition early on.	3.8	0.47705

Aggregate mean=3.66

### Discussion

Most respondents attributed the causes of malnutrition to a lack of access to nutritious food, inadequate healthcare services, poor sanitation and hygiene practices, limited financial resources, less access to mass media, lack of diet supplementation, and unhygienic water. This finding conforms with the findings of Tariku et al<sup>3</sup> which state that the immediate causes of malnutrition comprised of inadequate dietary intake and disease conditions and the underlying-level causes include insufficient household food security, inadequate social and care environment, and insufficient health service, and unhealthy environment. The similarities could be explained by the similarities of study locations being all low-income countries and the similarity of the instrument used for assessment. However, in contrast with the study of Govender et al<sup>8</sup> who found that the factors influencing malnutrition were parents' working status, number of children in the household, child's age,

birth interval, exclusive breastfeeding, child's vaccination status, and recurrent diarrhea. The differences observed could be due to different parameters assessed by the 2 different instruments used in the studies.

The study also reveals that the majority of the respondents strongly agreed that lack of awareness about proper infant and child nutrition, poverty, and economic constraints in the Samaru Community contribute to malnutrition in children. This study is in line with the cross-sectional descriptive design study by Kue et al<sup>7</sup> and several other studies that revealed poverty and low socio-economic status as one of the leading factors influencing the prevalence of malnutrition in children.

Limited access to nutritious food and insufficient breastfeeding practice (mean 1.9) are the least factors influencing the prevalence of malnutrition in the Samaru community this agrees with the Findings of Kue et al<sup>7</sup> which revealed that the majority of the respondents





adopted adequate breastfeeding and balanced diet in the management of malnutrition.

The findings of the study showed a satisfactory knowledge of level of strategy for reducing malnutrition in children 0-5 in Samaru community, Sabon Gari, Zaria, Kaduna State, with implementing a community-based nutrition program as a strategy to reduce malnutrition in children having the highest mean.

The findings of the study are also in line with the study of Kue et al<sup>7</sup> in their study on Strategies for Reducing Malnutrition by Caregivers amongst Children 0-5 Years in the Opiro Community where the majority of the respondents strongly disagreed that periodic nutritional surveillance cannot reduce malnutrition which means that periodic nutritional surveillance which is part of the community-based nutritional program is a means of strategies in reducing malnutrition in children.

#### ***Implications of the findings***

The study finds that mothers and caregivers of children between the ages of zero to five years have good knowledge of causes and strategies for reducing malnutrition. This implies that there was good knowledge among the respondents. Despite this, there was still a high prevalence of malnutrition among the study population. Therefore, there is a need for collaborative efforts among the mothers/caregivers, family, community leaders, local government authorities, and the state at large to provide means of ensuring the appropriate implementation of necessary strategies, protocols, and policies to curb the menace of malnutrition.

The health workers in both public and primary health centers should provide comprehensive nutrition, education, and counseling to caregivers emphasizing the importance of a balanced diet, breastfeeding, and hygiene practices. Offer workshops seminars and one-on-one counseling sessions to ensure that caregivers implement, and practice necessary skills needed to provide optimal nutrition for their children.

The local government authority should develop and implement community-based nutritional programs specifically tailored to the needs of the Samaru community. These programs should focus on promoting healthy feeding practices and increasing access to nutritious foods. The health workers in the Samaru community should establish a breastfeeding support group within the community to encourage and support exclusive breastfeeding during the first six months of a child's life. These groups can provide guidance, share experiences, and address, challenges faced by

breastfeeding mothers. There should be advocacy for policies and programs by the health workers that prioritize child nutrition at the local regional and national levels. More so, the health workers should collaborate with policymakers to develop and implement effective strategies, allocate resources, and integrate nutrition interventions into existing programs.

#### ***Strengths and limitations of the study***

The study was able to explore the knowledge of mothers/caregivers of children between ages zero to five years about the causes of malnutrition and the strategies for reducing it. This will pave the way for policymakers to focus more on the provision of policies on services and skills required to reduce the prevalence of malnutrition among the vulnerable population. Furthermore, more resources should be focused on implementing the basic strategies for reducing the consequences associated with malnutrition. This can in turn lead to a more productive and healthy society.

The study was not without limitations, firstly the use of non-probability sampling can give room for selection bias.

#### **Conclusion**

The study finds that the mothers and caregivers of children aged 0-5 years were found to have good knowledge of causes and strategies for reducing malnutrition in children. However, the nutritional values of children five years and below in Nigerian communities is low despite adequate knowledge of majority of the respondents on the causes and strategies of reducing malnutrition. Therefore, there is need for development of policies and program to ensure proper implementation of programs and services to reduce the prevalence and menace of malnutrition.

#### **Declarations**

***Ethical Consideration:*** Ethical clearance was obtained from Research Ethics Committee, Kaduna state university. Permission to carry out the study was obtained from the chairman Sabon-Gari local government and the village head of Samaru community. Similarly informed consent was obtained from the respondents and confidentiality was ensured.

***Authors' Contribution:*** Conceptualization: FUS, ASA  
Data collection: KMS, AA, SU  
Data analysis: NAI, UI, FUS  
Manuscript draft: FUS, ASA, SU  
Manuscript review and finalization: UI, FUS, KMS

***Conflict of interest:*** Nil



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