Original Research Article

Management Strategies of malnourished children and its Associated Factors in Yenagoa, Bayelsa State, Nigeria

ABSTRACT

Aim: Malnutrition being a public health problem among children is more common in low- middle-income countries such as Nigeria, with a nationwide prevalence rate of 32 percent among children under the age of five years. This study aims to assess the management strategies of malnourished children and its associated factors in Yenagoa, Bayelsa State, Nigeria.

Methods: This was a descriptive observational studyconducted among a randomly selected sample of 360 health workers who managed malnutrition among children aged 5 years and below in Yenagoa, Bayelsa state, Nigeria. Data was obtainedusing self-administered questionnaire.The level of significance was determined using a confidence interval of 95% and *P=.05.*

Results:the majority 355 (98.6%) of the respondents were female, with the age group 25 to 34-year-old accounting for the highest proportion of participants 160 (44.4%).Doctors 53 (14.8%), Registered Nurses 171 (47.8%), and Community Health Extension Workers (CHEW) 73 (20.3%) were the major categories

Comment [ng1]: Prospective or retrospective?

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of the health workers that participated in this study. Two-hundred and seventeen (60.3%) of the health workers claimed that 33% (one-third) of the children they see at the clinic weekly are malnourished.In the management of malnutrition, majority (71.15%) of the malnourished children were managedusing supplements and ready-to-use therapeutic foods. Other strategies include; formula (8.61%), and treating underlying illness (13.89%).The factors that affect the eradication of malnutrition were found to include beliefs (19%), socioeconomic status of parents and caregivers of the children (18%), food insecurity (23%), immune factors (15%), and malnutrition in form of poor dietary habits (25%).

Conclusion: Ready-to-use therapeutic foods wasthe major strategy employed in the management of malnutrition in children in Bayelsa State.Undernutrition, food insecurityCultural beliefs were factors that affect the eradication of malnutrition.

Keywords: Malnutrition, Undernutrition, Management, Strategies, Associated Factors, Children

Comment [ng3]: Malnutrition as you mentioned in the introduction means overnutrition as well as undernutrition but malnutrition term usually refers to undernutrition.
My advice is to remove the term overnutrition from the introduction to avoid this confusion and replace all undernutrition in the manuscript with malnutrition. You can indicate that malnutrition in this study means only undernutrition.

1. INTRODUCTION

Malnutrition has been defined by the World Health Organization as a condition in which there is an inadequate or excessive intake of nutrients, an imbalance of critical nutrients, or an impaired utilization of nutrients in the body[1].The concept of malnutrition encompasses both the state of overnutrition, which is associated with excessive weight gain and obesity, as well as undernutrition, which refers to a range of conditions such as wasting, stunting, and impaired immunity due to deficiencies in essential micronutrients [1].Undernutrition is mostcommon form of malnutrition in low and middle-income countries, especially among children of low socioeconomic status[2,3].Research has also shown that chronic malnutrition can exert significant effects on an individual's health, cognitive development, and productivity throughout their whole lives, hence there is a need for prompt detection of malnutrition and appropriate management which should be toward the goal of malnutrition eradication [4]. Undernutrition that occurs due to inadequate intake of vitamins and minerals, commonly known as micronutrientsoften result to micronutrient deficiency [4].Micronutrients play a crucial role in facilitating the synthesis of enzymes, hormones, and other vital components necessary for optimal growth and development of the human body. Hence, its deficiency impairs the growth and development of children[4,5].Approximately 45% of mortality cases in the population of children under the age of 5 are attributed to the condition of undernutrition[6]. Nigeria exhibits a substantial burden of malnutrition among children, ranking second globally, as indicated by a nationwide prevalence rate of 32 percent among children under the age of five[6]. It is estimated that over 2 million children in Nigeria are afflicted with Severe Acute Malnutrition (SAM), and the present rate of treatment only reaches two out of every 10 affected children[7].The Nigerian government and healthcare professionals are actively engaged in addressing malnutrition, particularly in children, through various approaches such as nutritional planning, direct nutrition and health interventions, as well as food-based initiatives that emphasize the consumption of a balanced diet using locally available food items including fruits and vegetables[8]. Efforts to eradicate malnutrition such as education and counseling of mothers and carers about appropriate feeding practices for their children, and how to make balanced meals from locally available food items have been identified. However, several factors have been shown to affect the effectiveness of eradicating malnutrition among children[7,9]. Therefore, this study aimed to

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Comment [ng5]: Is this in Nigeria, low-middle-income countries or all over the world?

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identify thelevel of eradication of malnutrition and the management of malnourished children in Bayelsa State of Nigeria.

2. MATERIALS AND METHODS

2.1 Study Design

This is a descriptive cross-sectional study of the management strategies of malnutrition by health workers for children aged 5 years and below. Ten (10) Primary healthcare facilities and 5 private hospitals were randomly selected across the 8 local government areas in Bayelsa State, South Southgeopolitical zone, Nigeria. The study population for this study was health workers comprising registered nurses, doctors, community health workers, and auxiliary nurses. The auxiliary nurses were found in the private hospitals.

Comment [ng8]: Is it one south?

2.2 Sampling Techniques and Method of Data Collection

A sample size of 360 health workerswas randomly chosen from the 8 local government areas in Bayelsa state. During the first stage, 10 Primary healthcare facilities and 5 private hospitals were randomly selected across the 8 local government areas in Bayelsa State. During the second stage, 24 participants were selected from each of the 10public healthcare facilities and 5 private healthcare facilities resulting in a total of 360 research participants for the study.

Comment [ng9]: Study period?
Over how long and time frame of the study.

Comment [ng10]: Healthcare workers seeing different patients or patients can overlap??? For example, nurses present the same patients as what doctors record.
Important to indicate this.

The research data were collected using self-administered questionnaires among the 360 research participants. Participants (N=360) included in this study were health workers comprising registered nurses, doctors, community health workers, and auxiliary nurses selected from the 8 local government areas in Bayelsa state. The survey questionnaire combined closed-ended Likert-scaled and open-ended questions. Part A focused on the respondent's demographic variables while Part B focused on strategies employed in the management of malnourished children as well as the factors associated with eradication of malnutritionin Yenagoa Bayelsa State of Nigeria.

Comment [ng11]: Is this international or created by the study group? Better for the reader if you could add the composition of the questionnaire.

2.3 Method of Data Analysis

The collected data were analyzed using descriptive statistics in Excel and IBM SPSS version 27. The results were reported in terms of frequency and percentage. The level of significance was determined using a confidence interval of 95% and a P-value of *P=.05*.

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3. RESULTS AND DISCUSSION

3.1 Results

Table 1 indicates that the majority of the research respondents, specifically 98.6%, were female, whilst a small proportion of only 1.4% were men. The age cohort that had the highest proportion of participation was the 25 to 34-year-old group, accounting for 44.5% of all respondents, closely followed by the 35-44-year-old group with 42.2%. Married individuals constituted the bulk of the participants, accounting for 54.2% of the total, whereas 37.2% were single mothers. The respondents were primarily from the Ijaw ethnic group, accounting for 85.8% of the total. The remaining participants were Igbos (10%), Deltans (2.53%), and Akwa Iboms (1.67%).

Table 1 Sociodemographic variables of respondents

Variables	Options	Frequency (N=360)	Percentage (%)
Sex	Male	5	1.4
	Female	355	98.6
Age	15 – 24	16	4.45
	25– 34	160	44.4
	35 – 44	152	42.25
	45- 54	17	4.8
	55 – 64	13	3.6
	Above 64	2	0.5
Marital status	Single	134	37.2
	Married	195	54.2
	Divorced	27	7.5
	Widowed	4	1.1
Ethnic group	Akwa Ibom	6	1.67
	Deltans	9	2.53
	Igbos	36	10
	Ijaws	309	85.8

The categories of the health workers showed that 36 (10.1%) of them were auxiliary nurses, 73 (20.3%) were community health workers, 171 (47.8%) were registered nurses, 53 (14.8%) were doctors and 24 (6.7%) were public health nurses (Figure 1).

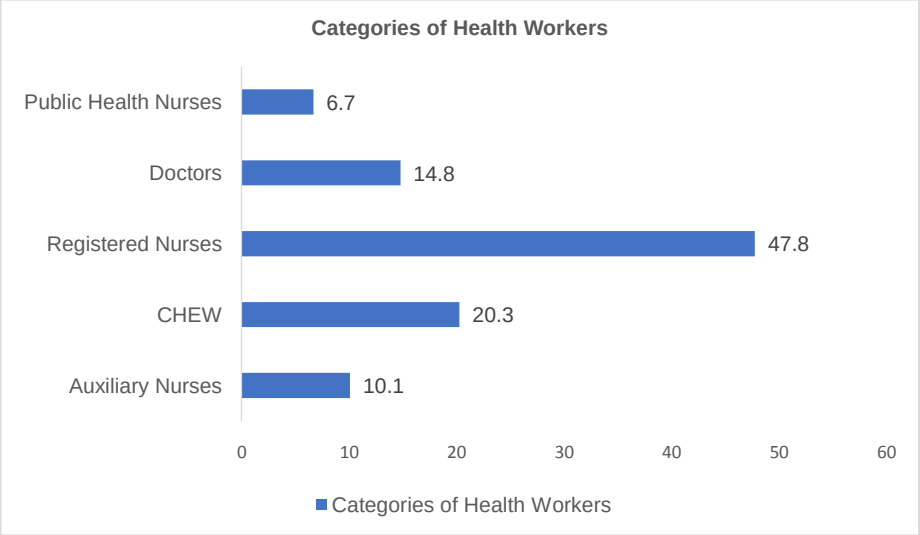

Figure 1: Categories of the health workers Respondents

Figure 2 shows the percentage of malnourished children that are seen in the clinic per week. 77 (21.4%) of the health workers reported that in a week, 20% of the children they see at the clinic are malnourished, and 1 (0.3%) of them reported that 25% of the children they see in the clinic per week are malnourished. 217 (60.3%) of the health workers claimed that 33% of the children they see at the clinic weekly are malnourished while 0.3% of the health workers submitted that 1 (50%) of the children they encounter at the clinic per week are malnourished. This implies that the majority of health workers encounter many malnourished on a weekly basis at the clinic.

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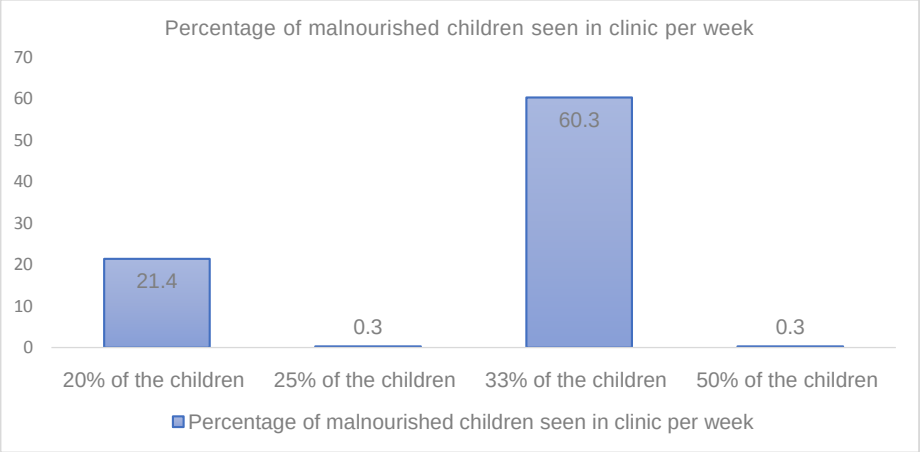

Figure 2: Percentage of malnourished children seen in clinic per week

Figure 3 shows the number of malnourished children that are treated in the clinic per week. 203 (56.4%) of the health workers reported that in a week, they treat 1 malnourished child per week. 79 (21.9%) of them reported that they treat 2 malnourished children per week. 30 (8.3%) of them reported that they treat 3 malnourished children per week. 3 (0.8%) of them reported that they treat 4 malnourished children per week and 45 (12.5%) of them reported that they treat 5 malnourished children per week

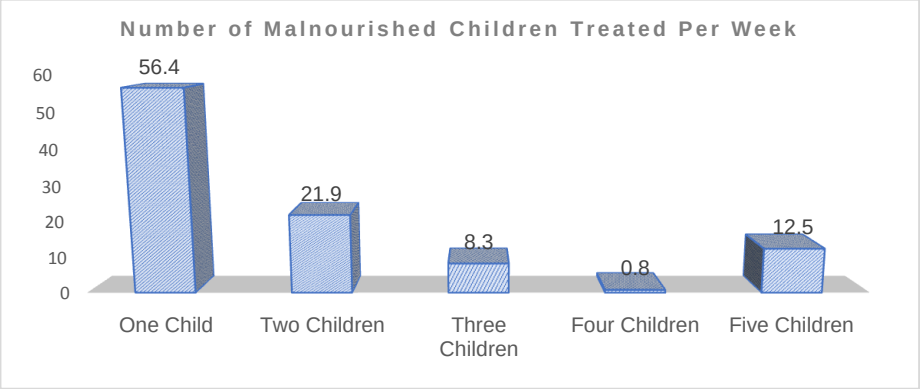

Figure 3: Number of malnourished children treated per week

Figure 4 shows the themes identified from the responses as the treatment prescribed for micronutrient deficiency among children under 5 years of age include;home-based dietary changes (0.56%), health education (3.06%), family/social support (1.39%), formula (8.61%), mix of micronutrient supplement and

formula (1.39%),treating underlying illness (13.89%) and giving ready-to-use therapeutic foodknown as "RUTF" (71.1%).

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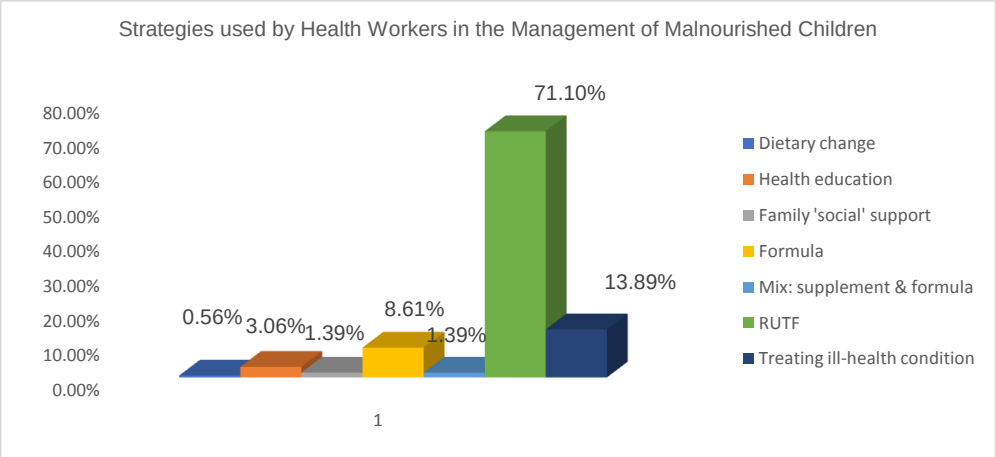

Figure 4: Strategies used by health workers in the management of malnourished children

Figure 5 shows the responses of health workers about following up with the children treated for malnutrition to find out if they recovered from malnutrition. 192 (53.3%) health workers sometimes conducted followed up with the children they treated for malnutrition to monitor recovery, 118 (32.8%) of the respondents' follow-up while 50 health workers (13.9%) did not do any follow-up.

Comment [ng15]: Follow up

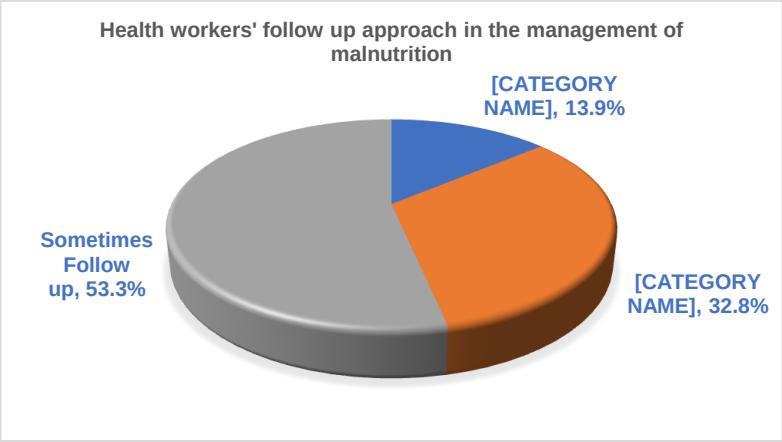

Figure 5: Health workers' follow up approach in the management of malnutrition

Figure 6 shows factors that affect the eradication of malnutrition among the children treated for malnutrition in the form of themes. The factors include cultural beliefs (19%), the socioeconomic status of parents and caregivers of the children (18%), food insecurity (23%), immune factors (15%), and undernutrition from poor dietary habits (25%).

Comment [ng16]: What does this mean? Secondary immunodeficiency due to malnutrition, HIV, or primary immunodeficiency....etc.

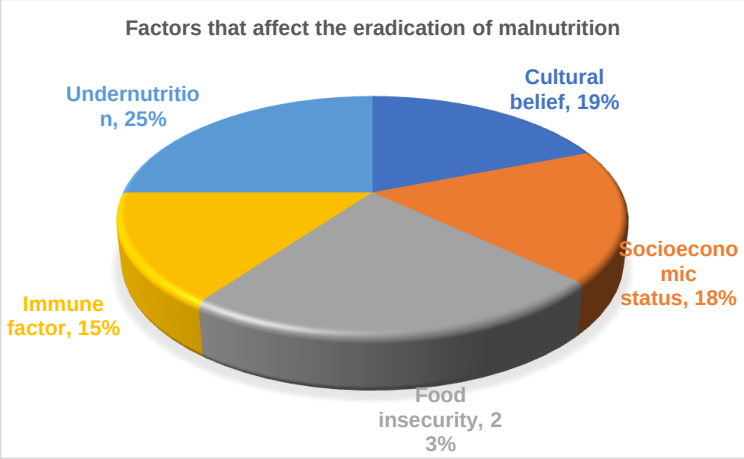

Figure 6: factors that affect the eradication of malnutrition

3.2 Discussion

This study identified various strategies used by the research participants in the management of malnutrition which included the use of ready-to-use therapeutic foods, modification of dietary patterns to include highly nutritious foods, administering micronutrient supplements and formula, educating parents and carers about balanced diet, family/ social support, and treatment of diseases that contribute to the development of malnutrition in children.It is worth noting that a small proportion, (0.5%), of the children suffering from malnutrition in this study were managed with home-based dietary changes. The majority (approximately 71.1%,) of the malnourished children managed by the health workers were managed using ready-to-use therapeutic foods (RUTF). A previous studies have also identified similar strategies for managing the occurrence of malnutrition in children which included food supplements, micronutrient supplements, and ready-to-use therapeutic foods[10–13].Ready-to-use foods (RUFs) refer to a category

Comment [ng17]: Maybe you need to mention the availability of RTUFs in the country. Whether it is available all the time or not and where clinics or hospital settings.

of food products that are specifically designed to be consumed without any additional preparation.They come in bars, pastes, or biscuits, and are created to contain optimal amounts of high-quality protein, energy, and essential micronutrients[14]. Researchers posit that ready-to-use therapeutic foods have a higher nutrient density compared to the locally available food items that are found at home.They do not require further preparation or processing before consumption, and they are highly effective in the management of malnutrition[15,16]. However, other studies have also indicated that therapeutic foods that are beneficial to malnourished children can be made from locally available food items such as locally grown pulses and cereals such as soybean and corn to enhance sustainability[17]. Another study opined that therapeutic foods can be locally made at home using legumes as an alternative to the conventional peanut base used for ready-to-use therapeutic foods [18].This study therefore recommends that it would be beneficial to train health workers on how to educate parents and caregivers on the prevention and management of malnutrition using locally available food items.

This study identified factors that affect the eradication of malnutrition to include; cultural beliefs, the socioeconomic status of parents and carers, food insecurity, immune-related issues, and undernutrition. Previous research has also identified several factors that affect the eradication of malnutrition among children which include cultural perspectives, socioeconomic status, food insecurity, educational and occupational backgrounds of parents, levels of knowledge and awareness of balanced nutrition, living environments that are either urban or rural, and the availability of nutritious food items and the purchasing ability of parents and caregivers[19–21]. Moreover, studies have shown that poverty and the resulting poor purchasing power is the most common factor that affects the eradication of malnutrition among children[12,13].

Comment [ng18]: Are these studies local or in other countries? As different countries with different challenges.

To effectively address socioeconomic issues, home cultivation of nutritious food items including fruits and vegetables should be encouraged as well as debunking the prevalent myths and misconceptions that hinder parents and carers from providing enough balanced meals to their children. Example of suchis the cultures that believe that giving meat to children will make the children steal[17].Studies shows that malnutrition can be eradicated through encouragement of home gardening, policy and government

support for local farming, provision of school meals and micronutrient supplements for children, and health education[10,12].

4. CONCLUSION

This study identified various strategies used by the in the management of malnutrition in Children in Bayelya State, Nigeria. Ready-to-use therapeutic foods, modification of dietary patterns to include highly nutritious foods, administering micronutrient supplements and formula, educating parents and carers about balanced diet, family/ social support, and treatment of diseases were the strategies employed in the management of malnutrition in children.Cultural beliefs, socioeconomic status of parents and carers, food insecurity, immune-related issues, and undernutrition were the identified factors that affect the eradication of malnutrition.

CONSENT

Informed consent was obtained from all participants included in this study after detailed explanation of the study procedure both in English Language and local dialect.

ETHICAL APPROVAL

Comment [ng19]: Please add the ethical approval number.

Ethical approval for this study was obtained from the research and ethics committee of Novena University, Ogume, Delta State. Permission was taken from the chairman of Patani Local Government Council. Informed consent was obtained from all participants after detailed explanation of the study procedure with assurance of confidentiality of the information that was collected. All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

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