Igiene e Sanità Pubblica 2024; 91 (4): 91-105

Reasons for dropouts in a community-based Management Acute Malnutrition (CMAM) program using local foods in the Far North of Cameroon

André Izacar Gaël BITA[1&2], Agbor Nyenty Agbornkwai[3], Herve Ebola Ambouol,[4] Jules Guintang Assiene[1]

Affiliation

[1]Helen Keller International, Department of Nutrition, Yaounde, Cameroon

[2]ICT University, Department of public health, Yaounde, Cameroon

[3]Catholic University of Central Africa, School of Health Sciences, Yaounde, Cameroon

[4]Texila American University, Faculty of medicine, Department of public health, Nicaragua

Keywords: *Community Management Acute Malnutrition, Dropout, Malnutrition, Food voucher, Lost to follow, Nutrition*

ABSTRACT

Introduction: The security crisis caused by the Islamic sect Boko Haram, coupled with arid climatic conditions and a context of poverty, has preyed on populations in the far north of Cameroon, exacerbating malnutrition rates among children under five years old. New evidence has shown that many children with moderate acute malnutrition (MAM) can be treated in their communities (CMAM) without having to be admitted to a health center or therapeutic feeding center. The purpose of our study was to identify factors that may lead to beneficiary dropout in a CMAM program in four health districts in the far north of Cameroon.

Methods: A retrospective descriptive study of children who exited the CMAM program as lost to follow-up. Trained CHWs interviewed mothers in the households of children identified as lost to follow-up in the CMAM program using a questionnaire. The data were analyzed using STATA software. The confidence interval used was 95% and a P-value of 5%.

Results: Seven hundred and ten children were identified as being lost to the CMAM program, 686 of whom were present in the households during the interviews. Boys were 40.20%; girls 59.79% and the median age was 19 months. In the post-CMAM period, boys (OR=0.64; p=0.018); children in Moulvoudaye health district (OR=0.32; p=0.0025), and households with ≥10 people were at lower risk of MAM. The risk of being MAM was higher in households located 6-10 km and ≥10km from a health facility (OR=4.21, p<0.0001). Vitamin A Supplementation (OR=0.37; p=0.0131) and dietary diversity (OR=0.60; p=0.0773) protected children from MAM. The main reasons for dropping out of the CMAM program cited by parents were that health personnel and CHWs had declared and discharged the child as cured (44.4%); mothers received information that

Igiene e Sanità Pubblica 2024; 91 (4):91-105

the project was over (17.54%); and mothers had traveled (10.2%). **Other reasons**: parents not keeping appointments (4.5%); children not responding to treatment (4.8%); shortage of food supplies (3.1%); and the long distance between the distribution site and the household (5.6%) etc.

Conclusion: Several children were discharged as dropouts while they were still active. These included discharge errors and those due to the end of the project. Distance, stock shortages, failure to keep appointments, parental relocation, and illnesses in children were all reasons for the high dropout rate. We recommend strengthening the quality of training for health personnel and CHWs on the CMAM protocol before implementation.

1. 1 Introduction

Malnutrition, as in many sub-Saharan African countries, remains a major public health problem in Cameroon. Since the early 1990s, successive Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS) have shown a worsening trend in the prevalence of malnutrition in Cameroon, with a recent leveling from prevalence's around 15% for underweight, slightly above 30% for stunting and 5% for wasting [1]. The DHS (2018) showed a high prevalence of acute malnutrition in children under five years of age. These results show that the prevalence varies from region to region. The regions of Adamaoua (34.6%); East (37%), Far North (37%), and North (41%) have the highest prevalence [2]. The 2019 SMART surveys had also shown a precarious situation for moderate acute malnutrition (MAM) with, 6.2% North; 5.5% East, and 5.2% in the Far North. The northern and far northern regions were in an alert situation for severe acute malnutrition (SAM) with 1.3% and 1.4% respectively [3]. Until recently, treatment was only provided in health centers, which considerably limited the scope and effectiveness of the fight against malnutrition.

New evidence indicates that many children with acute malnutrition can be treated in their communities even without admission to a health center or therapeutic feeding center. According to the World Health Organization (WHO), the community-based approach is the timely detection of acute malnutrition in the community and the provision of home-based treatment with ready-to-use therapeutic food or other nutritious food when there are no medical complications [4]. Several international humanitarian partners such as Helen Keller International (HKI), Action Contre la Faim, International Medical Corps, etc., and UN agencies are working alongside the Ministry of Public Health (MOH) in Cameroon to reduce the impact of malnutrition. In 2019, HKI received funding from the Office of U.S. Foreign Disaster Assistance (OFDA) to continue the food voucher approach in four health districts including Kaele, Guidiguis, Moulvoudaye, and Kar Hay, which include a total of 67 health facilities and 770 communities in the far north region of Cameroon. HKI's project worked alongside district health services, health facilities, the community, and households to strengthen links between the health system and communities, and to improve the prevention and management of acute malnutrition. This project used food vouchers to treat malnourished children with nutritious and affordable foods available in the local market. A community-based program required a lot of financial, time, and human resources to benefit the community and specifically the malnourished children. Therefore, food voucher program consisted of managing malnutrition involves nutritional education,

Igiene e Sanità Pubblica 2024; 91 (4): 91-105

regular home visits, and providing low-cost, locally available food support, with cost-effectiveness analysis indicating it as a feasible solution to eliminate malnutrition.

The project then trained community health workers (CHWs) in the relevant components of the Integrated Management of Acute Malnutrition and the locally validated version of the Essential Nutrition Actions (ENA) and Essential Hygiene Actions (EHA) program. Existing community platforms were used to provide monthly community screening using mid-upper arm circumference (MUAC) measurements to identify and refer acutely malnourished children for treatment and discussion of relevant ENA-EHA to promote optimal nutritional practices [5].

The main objective of the program was to promote preventive actions to reduce the burden of malnutrition and increase the proportion of acutely malnourished children, pregnant and lactating women receiving treatment in seven health districts of the Far-north region. And therefore, reduce the burden of acute malnutrition among children under 5 years of age, and pregnant and lactating women by filling gaps in care coverage in the Far North region of Cameroon resulting from the complex emergency around Lake Chad. At the end of the implementation of the activities, several children were considered lost to follow-up (having dropped out of the program). We found it appropriate to investigate and document the reasons why beneficiaries dropped out of the community-based moderate acute malnutrition management program (CMAM).

2. Materials and methods

2.1. Study design

This was a retrospective study nested in the qualitative review of children who either did not complete their follow-up in a CMAM program in four health districts in the far north of Cameroon (Kaele, Guidiguis, Moulvoudaye, and Karhay). The aim was to revisit all children identified as lost to follow-up or not responding to the CMAM program at home and to collect data on the reasons for dropping out and the factors that could determine whether the nutritional status of these children was restored after leaving the CMAM program.

2.2. Study location and population

This study was conducted in the far north region of Cameroon. It was conducted within the four health districts, namely Kaele, Guidiguis, Moulvoudaye, and KarHay. The study targeted children under five years of age who were followed up for the management of moderate acute malnutrition from January to August 2020 in the four target health districts.

The source population was all people living in the health districts of Kaele, Guidiguis, Moulvoudaye, and KarHay. The target population was all children under five years of age who had been followed in the MAM program by the OFDA-funded project implemented by HKI in the four districts, and whose parents/caregivers had voluntarily consented to participate in the study.

Inclusion criteria: children under five years of age who had either not completed their follow-up, were discharged as lost to follow-up or were discharged in error.

Exclusion criteria: children who were not enrolled as malnourished in the CMAM program; children who were transferred to the severe acute malnutrition management

Igiene e Sanità Pubblica 2024; 91 (4):91-105

centers; children who died during the program; and children whose parents/guardians refused to participate in the survey.

2.3. Sampling

This was an exhaustive sampling of all children who had not completed their follow-up under the CMAM program in the period from January to August 2020 in the health districts of Kaele, Guidiguis, Moulvoudaye, and KarHay. The sampling was based on the database of MAM management in the four districts. The selection of children in the database was based on the criteria for discharging children in the program and on the age of the children at the time of designing the list of children to be surveyed (exclusion of children older than 59 months).

2.4. Data collection tools and process

CMAM program intake records were used to identify children who had dropped out of the program and those who had not completed their intake. Interview forms filled out in the community by CHWs were used to analyze dropout rates and other parameters of the CMAM program. These forms collected several types of information, including.

- Demographic and anthropometric data at intake
- Parents' perception and satisfaction with the CMAM program
- The health status of the child in the household
- Nutrition of the child in the household
- Access to drinking water, hygiene, and sanitation in the household

A list of children to be surveyed was established by health district and by health area. The list included the child's name, the child's community, the child's enrollment code in the MAM program, the name of the child's representative, and the child's age group, allowing the interviewer to trace and identify the child in the community.

A total of 246 CHWs were trained to fill out the questionnaire by the previously trained health area managers. Once trained, the CHWs went door-to-door in the community to find the children they were looking for. Once the CHW found the child, he or she administered the questionnaire to the child's mother or caregivers. The trained CHWs, once in the child's home, introduced themselves and asked for verbal informed consent from the head of the household to administer the questionnaire. Once consent was given, the CHW would invite the mother to participate in the survey after explaining the purpose and answering any questions the mother had. The interviews with the mothers were conducted face-to-face in a remote location not far from the communal household; the location had to be quiet, with privacy and low ambient noise so as not to disrupt the interview. The CHWs asked questions and listened carefully to the mother without interrupting her and took notes. The data were not audiotaped but were recorded on the collection sheet and anonymized to ensure confidentiality. When the interview was completed, the CHW thanked the mother and moved on to the next child's household in the sample list until the list was exhausted.

If for some reason the child and the parent/caregiver moved or were no longer living in the community in question, the CHW would report this, and the child would be removed from the sample list and the next child on the list would be added. However, if the child was not present in the household and the mother or caregiver was present, the CHW administered the questionnaire.

Igiene e Sanità Pubblica 2024; 91 (4):91-105

Anthropometric data of children at discharge in the CMAM program were extracted from the MAM registers in the health facility where the child had been treated for MAM. The nutritional status of the children after discharge from the CMAM program was obtained from the data from the screening of the children's households during the home visits for the interview.

Thanks to a questionnaire grouping 07 food groups, the 24-hour recall was used to assess the dietary diversity of children in households during door-to-door interviews [6].

2.5. Data management and analysis

The data collected in the survey forms were entered into an Excel sheet and then coded for analysis by the software, STATA 16. The confidence interval and P-value used for statistical analysis (univariate and multivariate logistic regression) were 95% and 5% respectively. Graphs were designed using Excel 2016. For the multivariate analysis, only variables that were significant in the univariate analysis were retained in the model. Some variables, such as age, were removed from the model to avoid problems of multi-collinearity. Finally, the variables retained were gender, health district, the distance of the home from the health facility, number of people per household, Vitamin A supplementation (VAS), and dietary diversity.

For the analysis of qualitative data, we used Krueger's "long table" method, which consisted of identifying, through questioning, all the words transcribed verbatim from the semi-structured interviews. Each word was transcribed when it was relevant, and classified according to the themes that correspond to those of the interview form: the analysis, therefore, focused on the frequency of similar responses to the same question by the mothers.

2.6. Ethical Considerations

The study was conducted in accordance with the Declaration of Helsinki, the International Ethical Guidelines for Epidemiological Studies and the International Ethical Guidelines for Health-related Research Involving Humans. Verbal consent was obtained from the parents. We obtained the agreement of the health authorities of the Far North Regional Health Delegation. Data collection and electronic files were anonymous.

3. Results

3.1. Demographics data

A total of 710 children were pre-identified as dropouts in the CMAM program and 686 (96.62%) were present during the home visits. The available data showed that 406 (59.79%) children were male and 273 (40.20%) were female. The distribution of children by health district (HD) shows that 201 children were present in Guidiguis, 294 in Kaele, 50 in KarHay, and 134 in Moulvoudaye (Table 1).

Table 1 Distribution of children by Health District (HD) and by sex

Health district	Girls	Boys	Total	%
Guidiguis	116	85	201	29,60%
Kaele	175	119	294	43,30%
KarHay	27	23	50	7,36%
Moulvoudaye	88	46	134	19,73%
Total	406 (59,79%)	273 (40,20%)	679	100,00%

Igiene e Sanità Pubblica 2024; 91 (4): 91-105

The minimum age at entry of children into the program was 6 months and the maximum age was 58 months with a median of 19 months (interquartile range (IQR): 11 - 26 months). This median age ranged from 13 months (Moulvoudaye SD) to 24 months (Guidiguis and KarHay SD). However, the ages of 37 children were not reported.

3.2. Nutritional status of children in the community after the CMAM program and associated factors

At discharge, 30.7% (%IC 27.3 - 34.2%) of the children were MAM, i.e., 218 children out of 710. The univariate analysis of MAM status was performed and included in Table 2. The proportion of girls still suffering from MAM was three higher than that of boys with 33.7% and 11.1% respectively. Similarly, the proportion of children over 24 months of age still suffering from MAM was higher than that of children under 24 months of age, with 39.1% versus 26.0% respectively. According to the health districts, the proportion of MAM children varied from 16.2% (Moulvoudaye) to 42.3% (Guidiguis). According to the distance between the home and the nearest health facility, there was a significant increase in the number of children still suffering from MAM with distance (p = 0.0003). The number of persons per household also influenced the MAM status of children (p = 0.0355). Indeed, the more people in the household, the lower the proportion of MAM children. The number of children under 5 years of age per household varied from 1 to 3. However, this variable was not associated with MAM status (p = 0.994). Vaccination was not associated with MAM status (p = 0.6141). Among dewormed children, 30.1% were MAM and among non-dewormed children, 40% were MAM. However, the difference was not statistically significant (p = 0.6245). Children who consumed vitamin A were significantly less malnourished than those who did not (29.8% versus 50%, p = 0.019).

Consumption of roots and tubers, vegetables, and nuts; dairy products; meat products; fruits and vegetables; and eggs promoted improved nutritional status (Table 2). Based on the latter factors, we classified children with food diversity score (with score (≥4 groups of food) and those without (score <4 groups of food) among children with dietary diversity, 25.6% were MAM compared with 44.1% of children with a non-diverse diet. This difference in proportion was statistically significant (p <0.0001).

Table 2. Risk factors at MAM post CMAM

Variables n (%)		**Food groups consumed (24h recall)**	
Sex		Micronutrient powders NS	
girls	140/415 (33.7)	No	19/65 (29,3)
boys	78/288 (11.1)	Yes	191/618 (30,9)
Age (months) ***		Tubercules ***	
5 – 23	109/420 (26.0)	No	87/188 (46.3)
24 – 59	99/253 (39.1)	Yes	131/522 (25.1)
Health District ***		Legumes and nuts ***	
Guidiguis	89/210 (42.3)	No	104/245 (42.4)
Kaele	91/309 (29.4)	Yes	114/465 (24.5)
KarHay	16/55 (29.1)	Dairy products *	
Moulvoudaye	22/136 (16.2)	No	99/278 (35.6)
		Yes	119/432 (27.5)

Igiene e Sanità Pubblica 2024; 91 (4): 91-105

Variables n (%)		**Food groups consumed (24h recall)**	
Distance to health facilities (km) ***		Carrying products ***	
0 – 5	130/476 (27.3)	No	119/299 (39.8)
6 – 10	48/143 (33.6)	Yes	99/411 (24.1)
10 et plus	37/74 (50.0)		
Number of people by household *		Fruits and Vegetables ***	
0 – 5	86/260 (33.1)	No	111/288 (38.5)
6 – 10	109/375 (29.1)	Yes	107/422 (25.4)
10 et plus	3/29 (10.3)		
Number of children by household NS		Eggs ***	
1	82/272 (30.1)	No	103/270 (38.1)
2	100/336 (29.8)	Yes	115/440 (26.1)
3	16/53 (30.1)		
Immunization of child NS		Other fruits and vegetables ***	
No	6/15 (40.0)	No	89/212 (42.0)
Yes	210/688 (30.5)	Yes	129/498 (25.9)
Child dewormed NS		Vitamin A *	
No	6/15 (40.0)	No	15/30 (50.0)
Yes	209/681 (30.1)	Yes	201/674 (29.8)
		Food diversity ***	
		No	86/195 (44.1)
		Yes	132/515 (25.6)

****: p-value ≤ 0.001; **: p-value ≤ 0.01; *: p-value < 0.05; p-value < 0.1.*
NS: No significative; n : effectif

The results of the multivariate analysis have been summarized in Table 3. Only significant variables were retained in the model. We observe that boys are less at risk of being MAM than girls (OR = 0.64, p = 0.018). Children in the Moulvoudaye SD were less at risk than those in the Guidiguis SD (OR = 0.32, p = 0.0025). The risk of being MAM when the household was between 6-10 km from a health facility was 57% higher than the risk of being MAM when the household was within 5 km of a health facility. Similarly, children living in households located more than 10 km away were 4.21 times more likely to be MAM than those living in households located less than 5 km from a facility (OR = 4.21, p < 0.0001). Children living in households with fewer than 5 people are 5 times more likely to be MAM than those living in households with more than 10 people. VAS protects children from MAM status. Indeed, the Odds Ratio for children consuming vitamin A is 0.37, which means that children who have not been supplemented with vitamin A are 2.7 times more likely to be MAM than those who have. Dietary diversity also protects against post-CAMM MAM status (OR = 0.60, p = 0.0773).

Igiene e Sanità Pubblica 2024; 91 (4): 91-105

Table 3. Multivariate analysis of determinants of post-CMAM

Variables	ORa	IC95%	P value
Ordinate at the origin	1.74	0.69 - 4.43	0.2371
Sex			
Grils	1	-	-
Boys	0.64	0.44 - 0.92	0.0182
Health district			
Guidiguis	1	-	-
Kaele	1.16	0.66 - 2.09	0.6058
KarHay	1.00	0.49 - 2.01	0.9841
Moulvoudaye	0.32	0.15 - 0.67	0.0025
Distance to health facilities (Km)			
0 – 5 Km	1	-	-
6 – 10 Km	1.57	0.98 - 2.49	0.0599
10 km et plus	4.21	2.27 - 7.98	< 0.0001
Number of people by household			
0 – 5	1	-	-
6 – 10	0.98	0.67 - 1.44	0.9349
10 et plus	0.20	0.04 - 0.62	0.0135
Vitamin A Supplémentation (VAS)			
No	1	-	-
Yes	0.37	0.16 - 0.81	0.0131
Food diversification			
No	1	-	-
Yes	0.60	0.34 - 1.05	0.0773

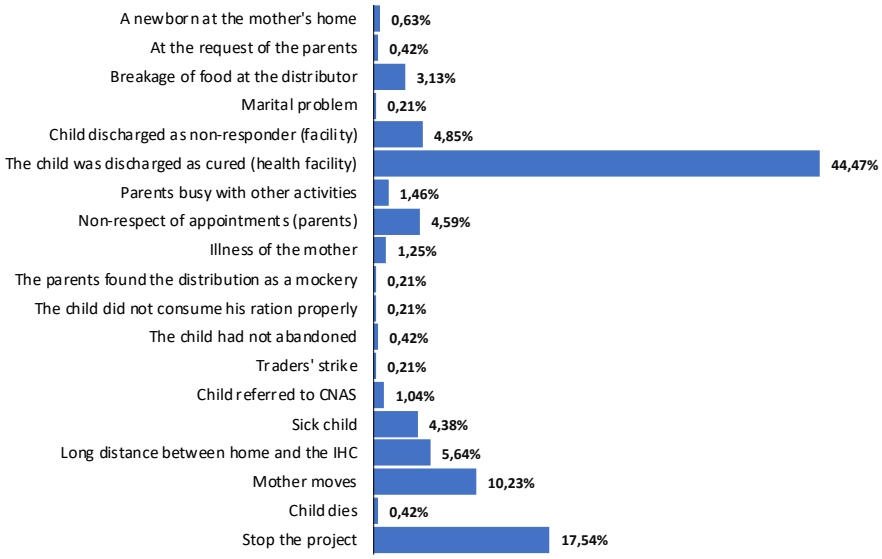
3.3 Reasons for children dropping out of the CMAM program in the target health districts.

Interviews with mothers in the homes of children who had dropped out of the CMAM program showed that there were several reasons why parents no longer brought their children to the food distribution centers for the management of malnutrition (Figure 1). The main reason given by the mothers was that the health staff or community health worker had declared the child cured (discharge error), representing 44.4% (213/479) of

Igiene e Sanità Pubblica 2024; 91 (4): 91-105

the children discharged. The second reason was that the mothers received information that the project was ending (17.54%), which explains why the children were discharged as abandoned by the health workers and CHWs when the project was ending. Another major reason cited was the mother's displacement from the geographic areas of distribution (10.2%). Other significant reasons included parents not keeping appointments (4.5%); children not responding to treatment (4.8%); food shortages (3.1%) and mothers finding the distance between the distribution site and the household to be long (5.6%) etc.

Figure 1. Reasons for leaving the CMAM program according to mothers.



Interviews with health workers and mothers showed that food distribution and measurement of anthropometric parameters were done by community health workers to ease the workload of health workers. One health worker said, "It is the community health workers who distribute the food and fill out the weight and height records. We check weight, height, and blood pressure on admission. This statement could explain the large number of children discharged in error, certainly due to poor measurement of anthropometric parameters by CHWs, which should be confirmed by health staff. One mother also stated, "I was given the food, and the relay asked me not to come back, that my child was cured".

Another mother said, "I arrived at the site, we waited for the food for hours with other women, and they came to tell us that the food is finished, that the project is finished, since that day I have not gone back. Another said, "I went twice, but the vendor did not come. This may explain why some mothers had to leave the program, either after receiving information that the project was halted, or the missed appointment by the vendor in charge of delivering the food to the site.

Several women also said that the distance to access the food was enormous, or that they traveled for long periods away from the distribution areas for family reasons, or to work in the fields. "I went to Guideo in another village far from here, I couldn't come back just to get the food," said two mothers.

Igiene e Sanità Pubblica 2024; 91 (4): 91-105

Discussion

Our study was interested in illustrating the dynamics of children in a CMAM program in the far north of Cameroon, particularly for children who dropped out of the program, and the factors that could determine the outcome of these children in the program. Out of 710 children searched, 96.71% were found, which is higher than the data published by Kone A et al, (2018). According to the authors, only 40.3% of children who dropped out of a CMAM program return to care [7]. This difference is explained by the fact that we sought out children at home doing door-to-door outreach using community CHWs.

Male children were more exposed to malnutrition with 59.79% compared to 40.20% female children. This has been shown by several other authors that boys are more affected by malnutrition than girls, such as Thurstans S et al, (2020) and Choudhury et al, (2020) [8, 9].

After exiting the CMAM program, we observed that 30.7% of the children were MAM. This higher proportion compared to that found in other CMAM programs as shown by Se-Eun Park et al, (2012) with 17.8% is justified by the fact that the children discharged from the program in our study did not meet the criteria for recovery before being discharged [10]. According to, Odei GA, et al (2016) discharging children from treatment when not fully recovered increased the risk of post-treatment relapses to malnutrition [11]. In addition, work by O Adegoke et al, (2021), and Heather C et al, (2018), showed that relapses to malnutrition were higher in the 2-6 months after discharging children from the program [12, 13].

The proportion of children over 24 months of age with MAM was higher than that of children under 24 months of age with 39.1% versus 26.0% respectively after discharge. These results are consistent with those of Abitew DB et al, (2020) who showed a higher proportion of relapsed MAM in children over 23 months of age compared to those under 24 months of age [14].

The distance between the home and the health facility, the number of people in the household, the child's immunization status, deworming, and vitamin A administration were all found to significantly influence the nutritional status of children in the community. Several studies had already highlighted the association between nutritional status and VAS, and vaccination [14, 15]. According to Sobze Sanou et al, (2020), the inadequate index of people living in households in the far north remains very high at 70.4% [16]. In this same geographical area, it has been shown that households can have up to 10 people which does not allow children to eat at their convenience and in a diversified manner. The study by Aoun N et al, (2015), also confirmed that there is a significant association between geographic access, time to access health services, and malnutrition [17].

The consumption of tubers, vegetables and nuts, dairy products, meat products, fruits and vegetables, and eggs favored the improvement of nutritional status. This could be explained by the high consumption of these products among children under five in the study area. The work of Sobze Sanou M et al, (2019) had already shown high proportions of certain products such as tubers and cereals (98.4%), meat products (73.1%); vegetables and nuts (63.6%); fruits and vegetables (62.9%), and low consumption of dairy products (29.1%) and eggs (3.4%) [6].

Children with dietary diversity are less at risk of malnutrition (25.6%) compared to

Igiene e Sanità Pubblica 2024; 91 (4): 91-105

44.1% of those with non-diversified diets. These results are consistent with those of Sobze Sanou M et al, (2019) in the far north of Cameroon, who showed a low proportion of children with dietary diversification (35.5%) and a low risk of malnutrition in the latter (2.2%) [6]. Similarly, the work of Adegoke et al, (2020) confirmed a low risk of relapse to malnutrition in children with a high dietary diversity score in the community after a malnutrition management program [12]. Other studies have shown a high proportion of inappropriate feeding practices (74.4%) scientifically linked to malnutrition (OR= OR=3.44; CI [2.06; 5.76] (P<0.05) [18].

Several studies have shown low dropout rates from the CMAM program, but few have addressed the reasons for dropout. Our study showed that the main reason given by mothers for dropping out of the program was that the health staff or community health worker had made a discharge error, i.e., 44.4% of children were discharged. This could be explained by the low level of knowledge of the CMAM program among health workers and community health workers in charge of implementation in the community. According to Khan A et al, (2020); Rahman, M. M., et al. (2020) and Alemu, B., et al. (2018)., the lack of knowledge about the CMAM program and the motivation, perception, attitude, and socio-economic status of health workers and CHWs are high dropout factors for the program [19, 20, 21].

Mothers had received information that the project was ending (17.54%), which explains why children were discharged as dropouts by health workers and CHWs when the project was ending. This could explain a lack of knowledge among health workers and CHWs about case management and program exit criteria. According to the protocol, these children who have spent more than three months in the program should be discharged as unresponsive to treatment and transferred to a follow-up center at the nearest functional health facility (therapeutic feeding center). The results also noted low documentation of non-responders to treatment (4.8%).

Several mothers reported moving out of the geographic distribution areas for several days and were excluded as dropouts in the program (10.2%). This factor had already been examined in Ethiopia by Molla M et al, (2017), showing that mothers' displacement from distribution sites is a major factor in program dropout. According to the authors, this is explained by mothers' lack of information about the program and their poor understanding of the program objectives [22].

A non-negligible proportion of non-compliance with appointments by parents (4.5%) had been found. This proportion is low, compared to the results found by Gebrehiwot M et al, (2016) which is a range of 10%-80% in Ethiopia. According to the authors, these high rates of non-adherence to appointments and dropout are justified by the remote distance to health facilities. This was also mentioned by the mothers in our study [23].

Mothers reported that the distance between households and the distribution site was high (5.6%), and other research has shown that long distance is a risk factor for dropping out of the care program. Other factors such as male gender, older age of the child, low socioeconomic status, and poor access to health services may also contribute to program dropout [19, 23, 24, 25].

Our results showed that food shortages (3.1%), and unavailability of vendors (distributors) during visits by mothers contributed to dropout from the CMAM program. This had already been shown by R. M. K. Gebremedhin et al, (2020) in the results of

Igiene e Sanità Pubblica 2024; 91 (4): 91-105

their work. According to the authors, stock-outs were associated with high dropout rates in CMAM programs. In addition, stock-outs are more common in remote areas and programs with poor supply chain management systems. Stock-outs are an important factor contributing to high dropout rates in CMAM programs [23].

4. Conclusion

The purpose of our study was to document the factors that may lead to the dropout of beneficiaries of a community-based acute malnutrition management program for children under five years of age in four health districts in the far north of Cameroon. The analysis of secondary data and community interviews made it possible to document the factors that could contribute to the deterioration of the nutritional status of children in post-CMAM care and to identify the factors that contributed to the abandonment of the program in the communities. It was found that gender, geographical area, the distance between the household and the health facility, number of people living in the household, and VAS are factors significantly associated with the incidence of malnutrition among children in the households. The reasons that led to the abandonment of the program by the beneficiaries were mainly the error of discharge by the health personnel and CHWs in the community; discharge at the end of the project; the distant distance between the households and the distribution sites; illness in the child, non-responders to the treatment, non-respect of appointments and stock-outs of inputs in the distribution sites For a better implementation of the CMAM programs in the future, we recommend (1) reinforcing the training of health personnel and CHWs on the CMAM protocol before implementation in the community; (2) reinforcing community participation in the planning of the CMAM programs, in particular in the choice of distribution sites; (3) reducing and anticipating input stock-outs in the distribution sites; (4) at the end of the project, transferring MAM children to outpatient nutritional centers.

Limitations of the Study

The data were collected approximately three months after the beneficiaries had left the CMAM program, which could lead to a bias related to the omission of certain information by beneficiaries.

Conflicts of interest

André Izacar Gaël BITA and Jules Guintang Assiene, HKI employees were involved in project implementation in the study area. However, this study was not commissioned or financed by HKI or MoH.

Acknowledgments

We thank Helen Keller Intranational, Office of Cameroon, and health workers of the health districts of Kaele, Guidiguis, Karhay, and Moulvouday in far north Cameroon.

References

1. MINSANTE, UNICEF et GIZ. SMART 2017 : enquête nutritionnelle et de mortalité rétrospective chez les femmes, les adolescentes et les enfants au Cameroun (Est, Adamaoua, Nord et Extrême Nord). 2018

2. Institut National de la Statistique (INS), et ICF. 2019. Enquête Démographique et de Santé du Cameroun 2018. Indicateurs Clés. Yaoundé, Cameroun, et Rockville, Maryland, USA : INS et ICF

Igiene e Sanità Pubblica 2024; 91 (4):91-105

3. ACF. Enquête nutritionnelle et de mortalité SMART dans quatre aires de santé des districts sanitaires de Goulfey, de Makary et Kousseri, du 16 au 24 Décembre 2020

4. OMS. Prise En Charge Communautaire De La Malnutrition Aiguë Sévère, 2007

5. Helen Keller International. Responding to Moderate and Severe Malnutrition among Children, Pregnant and Lactating Mothers Resulting from the Complex Emergency in the Far-North Region of Cameroon: Final Report. Helen Keller Inernational, Yaoundé, Cameroun, 2019. https://pdf.usaid.gov/pdf_docs/PA00THNK.pdf

6. Sobze Sanou Martin, Bita Andre Izacar Gaël, Djeunang Dongho Ghyslaine Bruna, Sieleunou Isidore, and Nkengfack Nembongwe Germaine Sylvie, "Food Profiles and Exposure to Acute Malnutrition among Children Under-five in the Department of Mayo-Danay, Cameroon." Journal of Food and Nutrition Research, vol. 7, no. 11 (2019): 759-765. doi: 10.12691/jfnr-7-11-1

7. Kone, A., Diallo, M., Bado, A., & Sanou, A. (2018). Retour des enfants abandonnés aux programmes CMAM : une analyse des données de l'enquête nationale sur la santé et la nutrition au Niger. Santé publique, 30(2), 213-221. doi:10.3917/spub.182.0213

8. Thurstans, S., Lenton, S., & Dangour, A. (2020). Gender and malnutrition: a systematic review of the evidence. BMC Public Health, 20(1), 1-11. doi:10.1186/s12889-020-08769-3

9. Choudhury, Kaneta K., Manzoor A. Hanifi, Sabrina Rasheed, and Abbas Bhuiya. "Gender Inequality and Severe Malnutrition among Children in a Remote Rural Area of Bangladesh." Journal of Health, Population and Nutrition 18, no. 3 (2000): 123–30. http://www.jstor.org/stable/23498867

10. Se-Eun Park, Sungtae Kim, Cyprian Ouma, Mesfin Loha, Thomas F Wierzba and Nam Seon Beck. Community Management of Acute Malnutrition in the Developing World. Pediatr Gastroenterol Hepatol Nutr , 15(4):210-219. DOI: https://doi.org/10.5223/pghn.2012.15.4.210

11. Odei, G. A. ; Karamagi, C. S. ; Wamani, H. Severe acute malnutrition and post-treatment outcomes among children in Uganda. RUFORUM Working Document Series (ISSN 1607-9345) No. 14 (1):2016, 479-487 Available from http://repository.ruforum.org

12. Adegoke, O, Arif, S, Bahwere, P, et al. Incidence of severe acute malnutrition after treatment: A prospective matched cohort study in Sokoto, Nigeria. Matern Child Nutr. 2021; 17:e13070. https://doi.org/10.1111/mcn.13070

13. Stobaugh, HC, Mayberry, A, McGrath, M, et al. Relapse after severe acute malnutrition: A systematic literature review and secondary data analysis. Matern Child Nutr. 2019; 15:e12702. https://doi.org/10.1111/mcn.12702

14. Abitew DB, Yalew AW, Bezabih AM, Bazzano AN (2020) Predictors of relapse of acute malnutrition following exit from community-based management program in Amhara region, Northwest Ethiopia: An unmatched case-control study. PLoS ONE 15(4): e0231524. https://doi.org/ 10.1371/journal.pone.0231524

15. James P, Sadler K, Wondafrash M, Argaw A, Luo H, Geleta B, et al. (2016) Children with Moderate Acute Malnutrition with No Access to Supplementary Feeding Programmes Experience High Rates of Deterioration and No Improvement: Results from a Prospective Cohort Study in Rural Ethiopia. PLoS ONE 11(4): e0153530. https://doi.org/10.1371/journal.pone.0153530

Igiene e Sanità Pubblica 2024; 91 (4):91-105

16. Martin Sobze Sanou, Andre Izacar Gael Bita, Ghyslaine Bruna Djeunang Dongho, Benjamin Azike Chunkukundun, Armand Tiotsa Tsapi, Isidore Sieleunou, Germaine Sylvie Nkengfack Nembongwe. Multidimensional Poverty and Acute Malnutrition of Children in Households of Mayo-Danay Division, Cameroon. International Journal of Nutrition and Food Sciences. Special Issue: Health and Nutrition: Challenges and Perspectives. Vol. 9, No. 1, 2020, pp. 25-32. doi: 10.11648/j.ijnfs.20200901.15

17. Aoun N, Matsuda H, Sekiyama M. Geographical accessibility to healthcare and malnutrition in Rwanda. Soc Sci Med. 2015 Apr;130:135-45. doi: 10.1016/j.socscimed.2015.02.004. Epub 2015 Feb 11. PMID: 25697636.

18. Benjamin AZIKE CHUKUWCHINDUN*, André Pascal GOURA, Landry BITA'A BEYALA, Anthony NJIMBIA CHEBE, André Izacar Gaël BITA, Joliette AZAKOH NGUEFACK, Jérôme ATEUDJIEU. Pratiques alimentaires des mères et malnutrition infantile dans le district de santé de Pitoa : Etude cas-témoin. Budapest International Research in Exact Sciences (BirEx) Journal, Volume 1, No 4, October 2019, Page: 144-155. DOI: https://doi.org/10.33258/birex.v1i4.486.

19. Khan, A., Khan, M., Khan, M., & Khan, M. A. (2020). Factors associated with dropout from community-based management of acute malnutrition programs among children under five in Pakistan: a systematic review and meta-analysis. BMC Public Health, 20(1), 1391. https://doi.org/10.1186/s12889-020-09346-4

20. Rahman, M. M., et al. (2020). Association between Caregiver Knowledge and Child Dropout in Community-Based Management of Acute Malnutrition (CMAM) Program in Bangladesh. International Journal of Environmental Research and Public Health, 17(17), 6269. https://doi.org/10.3390/ijerph17176269

21. Alemu, B., et al. (2018). Factors Associated with Dropout among Children Enrolled in Community-Based Management of Acute Malnutrition Programs in Ethiopia: A Systematic Review. Nutrients, 10(4), 472. https://doi.org/10.3390/nu10040472

22. Molla, M., Woldemichael, K., Tefera, A., & Gebre, T. (2017). Exploring the dynamics of dropout from Community-based Management of Acute Malnutrition (CMAM) programs in Ethiopia: a qualitative study. BMC Public Health, 17(1), 1-14. https://doi.org/10.1186/s12889-017-4389-4

23. Gebrehiwot, M., Berhane, Y., Berhane, Y., & Gebremariam, A. (2016). Non-Attendance and Dropout from Community-Based Management of Acute Malnutrition Programs in Ethiopia: A Systematic Review. PLOS ONE, 11(7), e0159073. https://doi.org/10.1371/journal.pone.0159073

24. Mishra, A., Kumar, M., & Gupta, S. K. (2020). Factors associated with dropout from community-based management of acute malnutrition programs among children under five in India: a systematic review and meta-analysis. BMC Public Health, 20(1), 1-14. doi:10.1186/s12889-020-08737-z

25. Ghimire, S., Koirala, S., & Koirala, S. (2020). Factors associated with dropout from community-based management of acute malnutrition programs among children under five in Nepal: a systematic review and meta-analysis. BMC Public Health, 20(1), 705. https://doi.org/10.1186/s12889-020-08742

Igiene e Sanità Pubblica 2024; 91 (4): 91-105

Corresponding author:

André Izacar Gaël BITA,
email bitagael@gmail.com