

Original Research Article

Recurrent Diseases and Therapeutic Itineraries of Malnourished Children in Households of Mayo Danay Division, Far North Cameroon

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Abstract

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The UNICEF Conceptual Framework (2013) shows that disease is one of the direct causes of malnutrition in children under five. The therapeutic itinerary plays a role in the prognosis of the disease, and in turn, affects the incidence of malnutrition in an individual. The data used in this article comes from the survey on the determinants of malnutrition in children under five in the department of Mayo Danay in the Far North of Cameroon. A cross-sectional, descriptive study was conducted on a cluster sample at two levels random sampling design was used. Anthropometric measurements were used to assess the nutritional status of children. The study in 295 households, with 433 children shows that the most recurrent diseases in households of malnourished children (acute form; stunting and underweight) are malaria; respiratory infection and diarrhea. The therapeutic itinerary taken by the parents of malnourished children (the three forms) are mainly health Facilities and self-medication. To reduce malnutrition in the study area, we recommend monitoring community-based surveillance for malaria, respiratory infection, diarrhea and promoting health facility attendance.

Keywords: Therapeutic itineraries, Malnutrition, child health, Cameroon, recurrent diseases

INTRODUCTION

In developing countries, nutritional problems are among the causes of morbidity and mortality in infants and preschool children, and pregnant women (Cravioto and Elsa, 1975). Acute malnutrition contributes to more than one million child deaths each year in Africa. Children with severe acute malnutrition have a higher mortality (OMS, 2013).

It is well known that disease is one of the direct causes of malnutrition in children under five. A sickness frequently goes with loss of appetite and lead to the reduction of food eaten. To fight infection, the organism uses existing nutrients and the quantity use is proportional to the severity of the disease. A

malnourished person has a weak immune system and is more prone to infections. Infections increase the potential for and severity of malnutrition (Baba et al., 2008). Some diseases and infections, such as tuberculosis, measles and diarrhea, are directly linked to acute malnutrition. The combination of disease and malnutrition weakens the metabolism, triggering a vicious cycle of infections and poor nutrition, which leads to increased vulnerability to disease.

The Far North region of Cameroon is one of the regions with the highest prevalence of acute malnutrition. Recent studies in this area had already shown that, multidimensional poverty among children was associated

Table 1. The most cited recurrent diseases in the households surveyed

First illness in the household	Number of households	Proportion% (IC 95%)
Acute respiratory infections	108	36,61 [31,1 -42,39]
Eye infection	2	0,68 [0,08% -2 ,43]
Skin diseases	2	0,68 [0,08 -2 ,43]
Diarrheal diseases	45	15,25 [11,35-19,8]
Malaria	134	45,42 [39,64- 51,30]
Wound	1	0,34 [0,01 -1,87]
Intestinal worms	3	1,02 [0,21-2,29]
Total	295	100

with the stunting; acute malnutrition and underweight (Sobze Sanou M et al., 2020); not diversified diet exposed to the acute malnutrition (Sobze Sanou M et al., 2019). According to A.I.G Bitá and coll., (2021), the causes of malnutrition in Mayo-Danay division is multifactorial (BITA AIG and coll., 2021).

The aim of this research was to identify the therapeutic itineraries most marked by parents in malnourished children in the of Mayo-Danay Division.

MATERIALS AND METHODS

We conducted a cross-sectional, descriptive study of a sample of 433 children, regardless of gender. The respondents were from households randomly drawn from the Mayo-Danay Division in Far-North Cameroon.

It was a two-stage cluster survey. This procedure ran in a random fashion from the selection of clusters to the households to be interviewed. This was done to optimize representativeness and thus limit selection bias. The first level of sampling was the village and the household was the second level or unit of survey. In a household, all target children meeting the inclusion criteria were included in the sample.

The calculation of the sample size (n) was done using the ENA version of November 24, 2012, used in SMART nutrition surveys. An estimated prevalence of 12%, which corresponded to the prevalence of wasting among children under five in the Far North region (DHS, 2011). To estimate the minimum sample size, we used a desired precision of 5% and a cluster effect of 1.5. The calculation by this software gave us a minimum sample size (n) of 265 children.

This study was carried out in April 2015. The interview of participants took place during the day or in the evening depending on the availability of target populations. After obtaining the consent of the head of the family or a legal representative, a questionnaire was administered in a face-to-face interview with the respondent. To ensure the quality of the data collected, investigators and supervisors were trained on the sampling method and anthropometric measurements for two days.

Epi-Info 7 allowed us to perform the various statistical

tests at a 95% confidence interval and a 5% random error. Tables were designed from Excel 2016.

This article analyzes data from a survey and qualitative research on the determinants of malnutrition in children under five in the Mayo Danay Division. The use of the data from this survey has already been the subject of 02 publications including Sobze Sanou M and coll., (2020); Sobze Sanou M and coll., (2019). The data analyzed here was therefore collected by the same methodology because it is the same survey (Martin et al., 2020; Sobze et al., 2019).

Parental written consent was obtained. We obtained the agreement of the health authorities of the Far North Regional Health Delegation. Data collection and electronic data files were anonymous.

RESULTS

In total, 295 households were surveyed, and 433 children observed, the children's ages ranged from 6 to 59 months, with an average age of 30 months and a median of 29 months. By gender, 220 (50.81%) female versus 213 (49.19%) male children were seen.

Anthropometric data showed high prevalence of global acute malnutrition (4.4%); underweight (13.9%) and stunting (23.3%).

The more frequent diseases mentioned by mothers as in households were among others (Table 1): malaria (134, 45.4%); followed by acute respiratory infections (108, 36.6%) and diarrhea (45, 15.2%).

Amongst children with acute malnutrition, the most recurrent diseases were, Malaria (46.1%); respiratory infections (30.7%) and diarrhea (23.0%). In underweight children, the most recurrent illnesses were respiratory infection (33.3%); diarrhea (30.7%) and malaria (28.2%). In children suffering from stunting, malaria (42.1%); respiratory infection (31.2%) and diarrhea (23.4%) were the most recurrent diseases (Table 2).

According to the therapeutic itinerary, "going to the health facility" is the first itinerary in the event of one of the recurrent disease in underweight malnourished children, the majority (58.9%) of mothers reported going

Table 2. Most recurrent diseases in households and types of malnutrition

Most Recurrent Disease And Acute Malnutrition				
1st Disease	Household	Normal Fed Children	Malnourished Children	TOTAL
Respiratory Infection		104	4	108
		36.88%	30.77%	36.61%
Eye Infection		2	0	2
		0.71%	0.00%	0.68%
Skin Diseases		2	0	2
		0.71%	0.00%	0.68%
Diarrhea Diseases		42	3	45
		14.89%	23.08%	15.25%
MALARIA		128	6	134
		45.39%	46.15%	45.42%
Wound		1	0	1
		0.35%	0.00%	0.34%
		3	0	3
Intestinal Worms		1.06%	0.00%	1.02%
		282	13	295
TOTAL		100.00%	100.00%	100.00%
Most Recurrent Disease And Underweight				
1st Disease	Household	Normal Fed Children	Malnourished Children	TOTAL
Respiratory Infection		95	13	108
		87.96%	12.04%	100.00%
		37.11%	33.33%	36.61%
EYE INFECTION		2	0	2
		0.78%	0.00%	0.68%
SKIN DISEASES		2	0	2
		0.78%	0.00%	0.68%
DIARRHEA DISEASES		33	12	45
		12.89%	30.77%	15.25%
MALARIA		123	11	134
		48.05%	28.21%	45.42%
Wound		0	1	1
		0.00%	2.56%	0.34%
		1	2	3
Intestinal Worms		0.39%	5.13%	1.02%
		256	39	295
TOTAL		100.00%	100.00%	100.00%
Most Recurrent Disease And Stunting				
1st Disease	Household	Normal Fed Children	Malnourished Children	TOTAL
Respiratory Infection		88	20	108
		38.10%	31.25%	36.61%
Eye Infection		2	0	2
		0.87%	0.00%	0.68%
Skin Diseases		2	0	2
		0.87%	0.00%	0.68%
Diarrhea Diseases		30	15	45
		12.99%	23.44%	15.25%
Malaria		107	27	134
		46.32%	42.19%	45.42%
Wound		0	1	1
		0.00%	1.56%	0.34%
Intestinal Worms		2	1	3
		0.87%	1.56%	1.02%
TOTAL		231	64	295
		100.00%	100.00%	100.00%

Table 3. First therapeutic itinerary and malnutrition

First therapeutic itinerary and underweight			
Therapeutic itinerary	Normal fed children	Malnourished children	TOTAL
	82	10	92
Automedication	32.16%	25.64%	31.29%
	158	23	181
Health facility	61.96%	58.97%	61.56%
	1	0	1
Healer	0.39%	0.00%	0.34%
Herbaltea (plant cocktail)	14	6	20
	5.49%	15.38%	6.80%
	255	39	294
TOTAL	100.00%	100.00%	100.00%
First therapeutic itinerary and stunting			
Therapeutic itinerary	Normal fed children	Malnourished children	TOTAL
	70	22	92
Automedication	30.43%	34.38%	31.29%
	145	36	181
Health Facility	63.04%	56.25%	61.56%
	1	0	1
Healer	0.43%	0.00%	0.34%
Herbaltea (plant cocktail)	14	6	20
	6.09%	9.38%	6.80%
Total	230	64	294
	100.00%	100.00%	100.00%
First therapeutic itinerary and acute malnutrition			
Therapeutic itinerary	Normal fed children	Malnourished children	TOTAL
	90	2	92
Automedication	32.03%	15.38%	31.29%
	170	11	181
Health Facility	60.50%	84.62%	61.56%
	1	0	1
Healer	0.36%	0.00%	0.34%
Herbaltea (plant cocktail)	20	0	20
	7.12%	0.00%	6.80%
	281	13	294
Total	100.00%	100.00%	100.00%

to a health center; 25.6% used self-medication. Among stunting, 56.2% went to the health center; 34.8% used self-medication. And among acute malnutrition, 84.6% went to the health center and 15.3% used self-medicated (Table 3).

DISCUSSION

This illustrative article tries to show a link that may exist between some specific recurrent illnesses in households and the high prevalence of malnutrition among children in Mayo Danay Division.

The high proportions of malaria; respiratory infection and diarrhea cited by parents in households would be

due to the low use of mosquito nets in households; poor sanitary conditions; and poor access to drinking water. Nearly 45.4% of parents cited malaria as a recurrent disease in the household. This could be justified by the fact that Cameroon is one of the fifteen countries most affected by malaria, with 3% of all malaria cases worldwide and 3% of malaria deaths in 2019. In 2017, more than 13% of malaria-related deaths among children under five years of age (Severe Malaria Observatory, 2021).

Acute Respiratory infections (ARI) appeared to be the second most recurrent disease in households of malnourished children with a frequency of 36.6%, this could be justified by the high prevalence of ARI in the far north. According to Tchatchou (2012), in the northern

regions, 11.7% and 16.8% of children suffer from ARI respectively in rural and urban areas (Tchatchou, 2012).

Our results show that diarrhea is the third recurrent disease in households of malnourished children with 23.4%. According to Ateudjeu et al. (2018), in Cameroon, childhood diarrhea is one of the leading causes of death among children under 5 years of age, after malaria, measles and respiratory diseases (Ateudjeu et al., 2018).

Nearly 58% of mothers reported going to a health facility in case of child illness. This proportion is high compared to the results of Chelo et al. (2016) which showed that more than 50% of children not consult a health facility as a first line but instead resort to the drug buy or obtained at home (Chelo et al., 2016). The high proportions of attendance at health services according to mothers in the Mayo Danay division could therefore attest to the action of community health workers and the duplicity of health awareness programs on the importance of visiting health centers in the event of illness.

On the other hand, there is a not insignificant proportion of self-medication, which could be due to the strong presence of many drug outlets in Cameroonian communities, in particularly in the far north of Cameroon. This could also be due to the low standard of living (poverty) of the populations, unable to afford care in health facilities.

CONCLUSION

Malaria, respiratory infections, diarrhea, and self-medication are believed to affect the prevalence of malnutrition in Mayo Danay division. To reduce malnutrition in the study area, we recommend monitoring community-based surveillance for malaria, respiratory infection, diarrhea and promoting attendance at health services.

LIMITATION

This research does not investigate the impact of therapeutic itinerary on malnutrition among children in the Mayo Danay Division. It does not provide evidence on the association of therapeutic itinerary and prognostics of malnourished children.

REFERENCES

- Ateudjeu J et al (2018). Profil et antibiosensibilité des bactéries pathogènes associées aux diarrhées chez les patients consultant à l'Hôpital Régional Annexe de Kousseri, Extrême-Nord Cameroun. *Pan African Med. J.* 2018 ;29:170. [doi: 10.11604/pamj.2018.29.170.14296]
- Bitá AIG, Chukuwchindun BA, Biwolé Omgba TE, Agbornkwai AN, Eyong JB, Sobze Sanou M (2021). Qualitative Analysis of the Determinants of Malnutrition Among Children Under-five in Households in the Mayo-Danay Division, Cameroon. *Budapest International Research in Exact Sciences (BirEx) Journal*. Vol 3, No 1, January 2021, Page: 755-766, e-ISSN: 2655-7827 (Online), p-ISSN: 2655-7835 (Print)
- Chelo D, Nguefack F, Ntoude A, Soh F, Ngou P, Koki Ndombo PO (2016). Verbal autopsy and therapeutic itinerary of children who die before arrival in a paediatric centre in Yaoundé, Cameroon. *TranslPediatri*. 2016 Jan;5(1):16-22. doi: 10.3978/j.issn.2224-4336.2015.12.05. PMID: 26835402; PMCID: PMC4729042.
- Cravioto J and Elsa De L (1975). "LA MALNUTRITION CHEZ L'ENFANT : LES RÉPERCUSSIONS SUR L'INDIVIDU ET LA COLLECTIVITÉ." *Revue Tiers Monde*, vol. 16, no. 63, pp. 525–549. JSTOR, www.jstor.org/stable/23589177. Accessed 6 July 2021.
- OMS (2013). *Prise en charge de la malnutrition aigüe sévère | WHO | Regional Office for Africa*. <https://www.afro.who.int/node/5167>. Accessed 6 July 2021
- Severe Malaria Observatory (2021). *Partage de connaissances à propos du paludisme grave*. <https://www.severemalaria.org/fr/pays/cameroun>. Accessed 21 July 2021
- Severe Malaria Observatory. *Partage de connaissances à propos du paludisme grave*. <https://www.severemalaria.org/fr/pays/cameroun>. Accessed 21 July 2021
- Sobze Sanou M, Bitá AIG, Djeunang Dongho GB, Chunkukundun BA, TiotsaTsapi A, Sieleunou I, Nkengfack Nembongwe GS (2020). 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, pp. 25-32. doi: 10.11648/j.ijnfs.20200901.15
- Sobze Sanou M, Bitá AIG, Djeunang Dongho GB, Sieleunou I and Nkengfack Nembongwe GS (2019). Food Profiles and Exposure to Acute Malnutrition among Children Under-five in the Department of Mayo-Danay, Cameroon. *Journal of Food and Nutrition Research*; 7(11) :759-765. doi: 10.12691/jfnr-7-11-1
- Tchatchou Djenang N (2012). Variations régionales de la survenance des infections respiratoires aigües chez les enfants de moins de cinq ans au Cameroun. IFORD, Yaounde, Cameroun. *Mémoire de Master professionnel en démographie*. https://ireda.cepdep.org/inventaire/ressources/tchatchou_2012.pdf. Accessed 21 July 2021