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Evaluation of the Nutritional Status of Children Aged 0 to 59 Months in the Kalonda West Health Zone, Kasaï, DRC, from January to September 2023

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Abstract

Introduction: Child malnutrition remains a major public health concern in the Democratic Republic of the Congo, particularly in the Kasaï province. This phenomenon disproportionately affects children under five years old, who are vulnerable to the devastating consequences of undernutrition. The aim of this study is to assess the nutritional status of children aged 0 to 59 months hospitalized in the Kalonda West and Ditekemena hospitals between January and September 2023. **Methods:** This is a cross-sectional descriptive study conducted at the Kalonda Ouest general reference hospital and the Ditekemenadu secondary hospital from January 1 to September 30, 2023. The study population consisted of all children aged 0 to 59 months hospitalized during the period. Statistical units were selected based on convenience sampling and exhaustive sample size. A total of 2238 medical records of hospitalized children meeting the selection criteria were retained for the study. Data collection was based on observation and document review of medical records. **Results:** Out of a total of 2238 medical records of children involved in our study, those aged between 12 and 23 months

were the majority, with a proportion of 35.1%. Household heads predominantly had a secondary education level (68%). Global acute malnutrition (GAM) prevailed at 25.2%, severe acute malnutrition (SAM) at 17.6%, and moderate malnutrition (MAM) was not observed. The mid-upper arm circumference revealed that 24.8% of children were malnourished or at risk. Clinical indicators showed: underweight (19%), wasting (17.7%), stunting (21.8%), and edema (1.1%). **Conclusion:** The nutritional status of children under five in the Kalonda Ouest area remains concerning. It is urgent to strengthen community strategies for screening, nutritional awareness, improving socio-economic conditions, and training health personnel. Targeted food support programs must be implemented, especially for households with low education levels and a high demographic burden.

Subject Areas

Public Health

Keywords

Assessment, Nutritional Status, Child, Health Zone, Kalonda Ouest, Kasaï, DR Congo

1. Introduction

Child malnutrition remains a major public health issue worldwide, particularly in low- and middle-income countries, where it significantly affects the growth and development of children under five years old [1]. At the continental level, severe acute malnutrition continues to increase in several African countries, with concerning prevalence in Mali, Chad, and the Horn of Africa, where over 7 million children suffer from severe malnutrition [2] [3]. In Sub-Saharan Africa, malnutrition rates remain high, with stunted growth affecting about 39% of children and notable underweight issues in several countries, including the Democratic Republic of the Congo (DRC) [4] [5]. East Africa shows higher rates of stunted growth, while West Africa is more affected by underweight issues [6]-[8].

In the DRC, according to the IPC analysis of acute malnutrition conducted in October 2024, approximately 1.1 million children under five suffer from acute malnutrition, including more than 250,000 cases of severe acute malnutrition requiring urgent treatment, particularly in the most affected health zones such as those in Kasaï [9]. This situation is exacerbated by recurring conflicts, food insecurity, and limited access to healthcare in Kasaï province. These data highlight the urgency of accurately assessing the local nutritional status of children in vulnerable areas such as Kalonda Ouest in a context of limited resources, with the aim of achieving universal health coverage to meet the sustainable development goals (SDG2).

The health zone of Kalonda Ouest, an urban-rural area, is one of the 18 health

zones of the Kasaï Province, accessible to a large population facing a significant prevalence of child malnutrition, but few local studies have been conducted to document this situation accurately. Therefore, it is essential to assess the nutritional status of children under five hospitalized in this area to guide public health interventions.

2. Methods

2.1. Study Design

A cross-sectional descriptive study was conducted.

2.2. Study Framework

Our study was conducted at the Kalonda Ouest General Reference Hospital and at the Ditekemena Secondary Hospital from January 1 to September 30, 2023.

2.3. Study Population

Our study population consists of children aged 0 to 59 months who were hospitalized in several healthcare facilities in the Kalonda Ouest health zone during the period from January to September 2023**.** The age, the height, the weight, arm circumference and the brachial parameter were considered as anthropometric parameters.

Inclusion Criteria

All children aged 0 to 59 months who were hospitalized and whose parents or guardians freely consented to participate in the survey.

Non-Inclusion Criteria

All medical records of children whose parents, guardians, and caretakers refused to consent to participation in the survey, those whose child was absent, and those whose age exceeded 59 months were automatically excluded from the study.

Sampling and Sample Size

Our sampling is exhaustive, and the sample size is 2238 patients of both sexes aged between 0 and 59 months. All eligible admissions were included. The hospital-based frame may limit generalizability to the wider community because this only represents the tip of the iceberg; many malnourished children are not brought to the hospital.

Observation, as well as document reviews, are techniques used to collect our information (data). The taking of anthropometric measurements also served us.

2.4. Data Processing and Analysis

Software used: Excel 2021, ENA, SPSS version 25 and the Zotero software was used to generate references.

2.5. Ethical Considerations

The study was conducted with the permission of local health authorities. It received the approval of the Medical Ethics Committee of the University of Lubumbashi.

3. Results

From January to September 2023, we evaluated the nutritional status of 2,238 children aged 0 to 59 months hospitalized in the two main healthcare facilities of the Kalonda West health zone. These main results will be presented in the form of tables.

Distribution of children by age (in months)

Table 1. Distribution of children by age in months.

Age (in month)	Frequency	Percentage (%)
0 - 11	457	20.4
12 - 23	786	35.1
24 - 35	557	24.9
36 - 47	309	13.8
48 - 59	128	5.7
Total	**2238**	**100.0**

Table 1 informs us that children aged 12 to 23 months are the most numerous (35.1%), followed by those in the 24 - 35 months age group (24.9%), and then 36-47 months. However, those aged 48 - 59 months are the least numerous, representing 5.7%. The average age of the children is 21.5 ± 6.07 months, the minimum age is 1 month, while the maximum age is 59 months.

Distribution of children by gender and care facility

Table 2. Distribution of children by gender and care facility.

Hospital	Male	Female	Total	Percentage (%)
Kalonda West	243	273	516	23.1
Ditekemena	739	983	1722	76.9
Total	**982**	**1256**	**2238**	**100**

Table 2 above reveals that girls (56.1%) are more numerous than boys (43.8%). More patients were recorded in Ditekemena (76.9%) than in Kalonda West (23.1%). The male/female sex ratio is 982/1256 = 0.78.

Socio-economic characteristics of household heads

Table 3. Distribution of household heads according to socio-demographic characteristics.

Variables	Categories	N = 2238	%
Head of the household education level	None	212	9.5
	Primary	312	13.9
	Secondary	1523	68
	University	191	8.6

Continued

Marital status	Maried	1984	88.7
	Common law partnership (free union)	71	3.2
	Single	4	
	Others (divorced, widowed)	179	0.2
Occupation	Liberal	716	8
	Digger	524	32
	Farmer	487	23.4
	Teacher	191	21.7
	State agent	191	8.6
	Pastor	129	8.6
Religion	Evangelical churches/others	1672	5.8
	Catholic	316	34.7
	Protestant	250	14.1
Size (number of children)	1 - 5	566	11.2
	6 - 10	1294	25.3
	11 and more	378	57.8

Table 3 informs us that many heads of households have a secondary level of education (68%) and primary level (13.9%). Regarding marital status, 88.7% are married compared to 3.2% who live in a common-law relationship. Most heads of households engage in a liberal profession (32%), followed by excavators (23.4%), teachers, and state agents (8.6%). 34.7% of heads of households pray in revival churches (34.7%) compared to 14.1% who are either Catholic (14.1%) or Protestant (11.2%). 57.7% of children came from households composed of 6 to 10 children.

Prevalence of malnutrition according to clinical form

Table 4. Prevalence of malnutrition according to clinical form.

Type of malnutrition	Frequency	Percentage (%)
Global acute malnutrition (GAM)	565	25.2
Severe acute malnutrition (SAM) (P/T < −3 ET)	393	17.6
MAS with complications	172	7.7
MAS without complications	0	0.0
Moderate acute malnutrition (Weight/Height < −2 standard deviations)	0	0.0

Table 4 indicates that the types of malnutrition encountered are: global acute malnutrition (25.2%), severe acute malnutrition (17.5%), and acute malnutrition with complications (7.6%).

Nutritional status according to the arm circumference

Table 5. Assessment of nutritional status according to the arm circumference.

Brachial perimeter (mm)	Frequency	Percentage (%)
<100 (severe malnutrition)	74	3.3
100 - 120 (moderate malnutrition)	471	21.0
120 - 125 (high risk of malnutrition)	7	0.3
125 - 135 (moderate risk of malnutrition)	2	0.1
>135 (satisfactory nutritional status)	1684	75.3

Table 5 shows us that the prevalence of severe malnutrition according to the arm circumference is 3.3%, while that of moderate malnutrition is 21%. In contrast, 75.2% of children have a satisfactory nutritional status.

Clinical criteria for malnutrition

Table 6. Classification of malnutrition based on clinical criteria.

Criteria	Yes	No	% (Yes)
Underweight (P/A < −2 Z score)	426	1812	19.0
Emaciation or weight loss (P/T < −2 Z score)	397	1841	17.7
Growth retardation (T/A < −2 Z score)	488	1750	21.8
Presence of edema	25	2213	1.1

Table 6 indicates that underweight is at 19%, while stunting is at 21.8%. Furthermore, these malnutrition cases are accompanied by wasting in 17.7% of cases and edema in 1.12%.

4. Discussion

The results lead us to make the following comments: Girls (56.1%) outnumber boys (43.8%). Many patients were recorded in Ditekemena (76.9%) compared to Kalonda West (23.1%) (Table 1 and Table 2). The male/female ratio is 982/1256 = 0.78. Ditekemena Hospital recorded many children, as it is in the city centre and very accessible (Table 2). The results of this study show an alarming prevalence of global acute malnutrition (25.2%) and severe malnutrition (17.6%) (Table 4 and Table 5) among children hospitalized in the Kalonda West health zone, far exceeding the emergency threshold set by WHO in 2024 (>15%) [10]. This situation is consistent with recent data from the IPC analysis in the DRC, which estimates that about one million children suffer from acute malnutrition in the most vulnerable areas, including Kasaï (IPC, 2024) [9]. This result is like that of Walet Hartata [3]. This high prevalence would be linked to the poverty of the population, to dietary imbalance, to irregular food intake, and to the community's dependence on external aid. The clinical criteria reinforce these findings, with high rates of

stunting (21.8%), underweight (19%), and wasting (17.7%). The low rate of oedema (1.1%) could indicate that most cases of severe acute malnutrition (SAM) are of the dry type, without visible oedematous complications (**Table 6**).

In socio-economic terms, most heads of households have a secondary education level (68%) and engage in precarious professions (farmers, diggers, informal workers) (**Table 3**). These factors are known to be associated with an increased risk of childhood malnutrition, as shown by several studies [4] [9]. The high prevalence of stunting (21.8%) and underweight (19%) observed in our sample aligns with findings in other African studies, where chronic and acute malnutrition often coexist, exacerbated by unfavorable socio-economic factors [5] [8].

The link between the low level of education of household heads and child malnutrition is also confirmed by several studies, which highlight that maternal or parental education is a key determinant of children's nutrition [11] [12]. Moreover, the age group most affected (12 - 23 months) (**Table 1**) corresponds to the critical period of weaning and food diversification, often marked by inadequate food practices and an increased risk of infectious diseases [13] [14]. At the African level, studies conducted in similar contexts also show that the age group of 6 to 23 months is particularly vulnerable. These results support the importance of targeted interventions for young children and households with low socio-economic status [15].

In the DRC, recent demographic and nutritional surveys [16] confirm a high prevalence of global acute malnutrition, particularly in provinces affected by conflict and poverty, especially in the Kalonda West health zone. The 2023 IPC analysis also highlights that severe acute malnutrition affects a significant proportion of children under five in the Kasaï province, with urgent needs for nutritional support [9]. Inter-community conflicts in Kamuina Nsapu and food insecurity in Kasaï province, especially in the Kalonda West health zone, contribute to worsening the nutritional situation, as shown by several recent reports on malnutrition in the DRC and Central Africa [16].

This data suggests the urgency of targeted interventions in vulnerable households, including supplementation programs, nutritional education, and improved access to healthcare.

5. Conclusions

The assessment of the nutritional status of children aged 0 to 59 months hospitalized in the Kalonda Ouest health zone reveals a critical nutritional situation. The high prevalence of severe acute malnutrition and stunted growth highlights structural deficiencies in early management, nutritional prevention, and access to care. These results emphasize the urgency of multisectoral interventions targeting both the immediate causes (nutrition, diseases) and the underlying causes (poverty, education, hygiene). To reduce the prevalence of malnutrition, we suggest the following:

Awareness, community training (key high-impact priority interventions during

the first 1000 days of a child's life and on key family practices), the promotion of infant and young child feeding by valuing local products, the promotion of community fields, fish farming, small gardens, community-based nutrition activities, communication for social and behavior change, as well as multisectorality. Policymakers, public health actors, and technical partners must rely on this data to strengthen community strategies for screening, treating malnutrition, and providing nutritional support. Finally, this study serves as a foundation for complementary research that integrates community and environmental dimensions.

Conflicts of Interest

The authors declare no conflicts of interest.

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