



Evaluation of the prevalence of malnutrition among children aged 6 to 59 months hospitalized in Kisangani city, DR Congo

Joseph-Désiré Oleko WA Oleko^{1*}, José K Mubaya², Richard N Tongo³, Jean-Pauli E MBA⁴, Louis L Ndjondo⁵

¹ Institute Superior of the Medical Techniques of Tshumbe, P.O. BOX. 64 Tshumbe, DR Congo

² Institute Superior of the Medical Techniques of Kinshasa, P.O. BOX. 774 Kinshasa, DR Congo

³ Higher Institute of Commerce of Lubumbashi, P.O. BOX. 123 Lubumbashi, DR Congo

⁴ Faculty of Juridical and Political Sciences, Bangui University, Bangui, P.O. BOX 86, Bangui, C.A.R

⁵ Faculty of Medicine, Free University of Kisangani, Kisangani, P.O. BOX 212, Kisangani, DR Congo

Abstract

A descriptive cross-sectional study was organized to evaluate the prevalence of malnutrition among children from 0 to 59 months living in the commune of Mangobo during the period from January 1, 2017 to December 31, 2018. By the use of the investigation of documentary technique and based on the selection criteria, we obtained a sample of 228 cases of malnourished children.

The results of our study are as follows: the prevalence of malnutrition is 22.9%; the sample is made up of 57.9% of male cases and 42.1% of female cases; severe acute malnutrition is 19.3% and moderate acute malnutrition is 46.0%; the average duration of hospitalization is 36 days (1 month and 1 week); the main cause of loss of appetite is vomiting (39.0%), diarrhea (24.2%) and trauma (20.6%); on discharge from the hospital: cured cases (74.1%), cases of deceased (15.0%) and cases of lost to follow-up (10.9%).

Keywords: weight loss, loss of appetite, malnutrition, childhood, Kisangani, DRC

1. Introduction

In the world, the prevalence of severe acute malnutrition in children aged 0 to 59 months is high in pediatric hospitals. In 2019, the World Health Organization (WHO) estimates that 49.5 million children aged 0-59 months were suffering from wasting (too low in weight) in the world. And half of these children live in South Asia and one-quarter in sub-Saharan Africa [1].

In 2018, the Food and Agriculture Organization of the United Nations (FAO) states that "chronic undernutrition affects about 821 million people worldwide. And, the majority of malnourished people (515 million) live in Asia, 256.5 million in Africa and 39 million in Latin America and the Caribbean [2].

This sad situation is denounced by Doctors Without Borders (MSF), which estimates that 2.5 million children aged 0 to 5 months die from malnutrition each year in the world; an average of one death due to malnutrition of a child in every twelve seconds [3]. Malnutrition remains a public health problem in sub-Saharan Africa.

In 2014, the United Nations Children's Fund (Unicef) estimates that 2 million children from 0 to 59 months who suffer from malnutrition in DR Congo. The epidemics of measles, cholera and malaria threaten their survival. And this report states that more than 296,000 children suffer from severe acute malnutrition [4].

By the way, children who are malnourished, have a weakened immune system, this leads to a higher risk of infections and additional complications of their primary disease [5, 6, 8]. These

adverse effects lead to prolonged hospitalization and increase the financial burden on the health system [9, 12]. In addition, in the long term, the growth potential and cognitive development of the child are affected [13, 15]. That said, malnourished hospitalized children require special attention because their inadequate nutritional status certainly has a significant impact on their growth [16].

Chronic malnutrition is an indicator of household food security, when it is high; it indicates a situation of chronic food insecurity in households. And this chronic malnutrition rate is a major nutrition problem according to WHO thresholds. And poverty, natural disasters, wars and lack of promotion of adequate agricultural policy contribute directly to the food shortage in the markets, and poor households will no longer have access to the food of their choice. This poverty is both the cause and the consequence of malnutrition. Malnutrition is the cause of half of all deaths in children under 5 and pregnant women [17].

The policy of exclusive breastfeeding for up to six months of age effectively contributes to the promotion of the fight against child malnutrition from 0 to 59 months. And according to the survey organized by Joseph Désiré OLEKO with breastfeeding women from the city of Kisangani in DR Congo; Only 51.4% of mothers practice the strategy of exclusive breastfeeding until six months of age [18].

Although the opportunity that this strategy offers to ensure the health of our babies, because of the socio-cultural influence, many breastfeeding women continue to use formula (milk of substitution) to feed their children of less than six months.

Although WHO's new child growth and development standards, recommend exclusive breastfeeding for up to six months [19].

Generally, children need a good diet to develop and grow harmoniously, to protect themselves against diseases and to have enough energy to study, learn and practice physical activity [20]. Finally, to promote the health of our young children, the objective of this study is to determine the prevalence of malnutrition among hospitalized children aged 6 to 59 months in the city of Kisangani.

2. Study Area and Method

2.1. Study area

This investigation is being conducted in the central office of the Mangobo Health Zone in Mangobo Commune in Kisangani City. This office collects all the health service data of all the health institutions of the commune of Mangobo in a tool of National System of Sanitary Information (SNIS). By the documentary technique, we will exploit the data from the period 01 January 2017 to 31 December 2018. The investigation took place from 01 to 15 September 2019.



Fig 1: Location of Mangobo City in the province of the Tshopo, DRC.

2.2. Methodology

After having received the authorization of organization of the investigation by the head of Provincial Division of health of Tshopo. On the basis of the National Health Information System (SNIS) tool, follow-up sheets for each patient and the patient entry and exit register, we identified 1321 cases of children treated in pediatric cases of malnourished children, by the selection criteria, we selected a sample of 228 cases of children.

The inclusion criterion is any child from 6 to 59 months old living in Mangobo, suffering from illness with malnutrition and having complete consultation file. The criterion of non-inclusion is any child from 6 to 59 months suffering from a disease with severe acute malnutrition but having an incomplete consultation file. The confidentiality of the data has been guaranteed; the identity of the child has not been disclosed because each child is represented by a number.

2.3. Type of Survey

Our study is descriptive transversal.

2.4. Parameters of Survey

Our study exploited the following variables:

- Gender.
- Age.
- Weight.
- Size.
- Nutritional status.

- Length of hospitalization.
- Causes of loss of appetite.
- Exit status.

2.5. Analysis and interpretation

Epi Info 5.34., their analyzes and interpretations have been exploited in the different tables with calculation of percentage according to the following formula:

$$\% = \frac{fo \times 100}{N}$$

From where:

FO = observed frequency; N = sum of frequencies or total frequency;

100 = conversion factor in percentage and % = percentage.

The evaluation of our sample was done by comparing children's measures (weights, ages, and sizes) with other children of the same age or reference to new WHO growth standards [21].

3. Results

Based on the SNIS tool, we identified 304 cases of children from 6 to 59 months suffering from diseases with malnutrition. And based on selection criteria, we selected 228 cases of children as a sample.

The data in Table 1 show the distribution of sick children according to malnutrition. The prevalence of malnutrition in health institutions in the municipality of Mangobo is 22.9%.

Table 1: Distribution of children by prevalence of malnutrition

Diseases	Effective	%
Malnutrition	304	22.9
Other diseases	1021	77.1
Total	1325	100.0

The data in Figure 2 show the distribution of malnourished children by sex. The male sex is high (57.9%) against 42.1% of female sex.

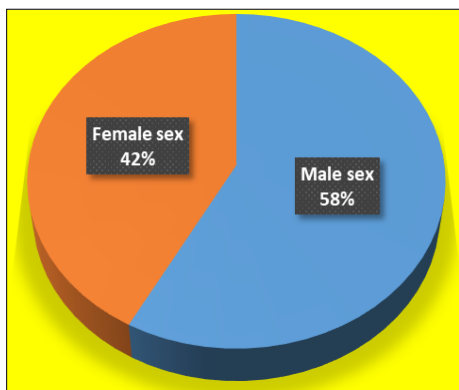


Fig 2: Distribution of malnourished children by gender

Table 2 shows the distribution of malnourished children by age. The age of all children ranges from 6 to 59 months, the 16 to 36 months' age range is 45.7% higher, and the 6 to 16 months' age range is 14.0%.

Table 2: Distribution of malnourished children by age

Age (months)	Effective	%
[6 – 16]	32	14,0
[16 – 26]	55	24,2
[26 – 36]	49	21,5
[36 – 46]	42	18,4
[46 – 59]	50	21,9
Total	228	100,0

Table 3 gives the distribution of malnourished children by weight. The weight of all children ranges from 3 to 12 kilograms, 50% of malnourished children weigh between 5 to 8 kg.

Table 3: Distribution of malnourished children by weight

Weight (kilogram)	Effective	%
[2 – 4]	42	18,4
[4 – 6]	55	24,1
[6 – 8]	59	25,9
[8 – 10]	45	19,8
[10 – 12]	27	11,8
Total	228	100,0

Table 4 gives the distribution of malnourished children by size. The size of all children ranges from 45 to 120 cm, the range of the most abundant malnourished children (34.7%)

Lies between the heights of 80 to 100 cm.

Table 4: Distribution of malnourished children by size

Size (Centimeter)	Effective	%
[40 - 60]	27	11,8
[60 - 80]	65	28,5
[80 - 100]	79	34,7
[100 – 120]	57	25,0
Total	228	100,0

Table 5 gives the distribution of malnourished children according to their nutritional status. Moderate acute malnutrition is prevalent in 46.0% of cases, against 19.3% for severe acute malnutrition.

Table 5: Distribution of malnourished children by nutritional status

Nutritional status	Effective	%
Severe acute malnutrition	44	19,3
Moderate acute malnutrition	105	46,0
Risk of malnutrition	79	34,7
Total	228	100,0

The data in Table 6 shows the distribution of malnourished children by length of hospital stay. The duration of hospitalization at high strength (46.1%) is in the interval 31 to 50 days and at low strength (9.2%) is the interval 91 to 111 days.

Table 6: Distribution of malnourished children by length of stay

Hospital stay (days)	Effective	%
15 à 30	105	46,1
31 à 56	72	31,6
47 à 62	30	13,1
63 à 78	21	9,2
Total	228	100,0

Figure 3 shows the distribution of malnourished children by their cause of loss of appetite. The main cause of loss of appetite is vomiting (39.0%), diarrhea (24.2%), trauma (20.6%) and digestive disorders (16.2%).

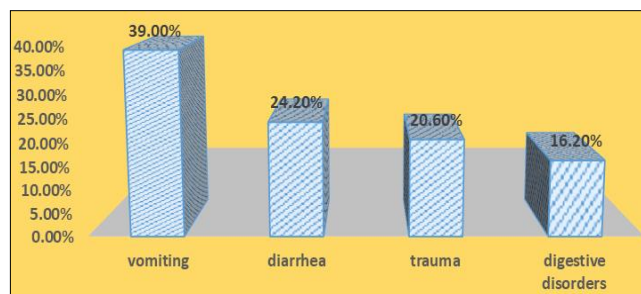


Fig 3: Distribution of malnourished children according to the cause of loss of appetite

At the end of medical treatment, the data in Figure 4 show that the majority of cases are cured (74.1%), lost view 10.9% and died 15.0%.

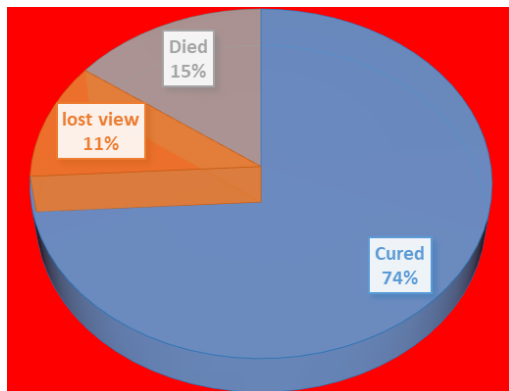


Fig 4: Distribution of malnourished children by exit status

4. Discussion

Seventy-eight malnourished children were not selected for the study because of insufficient information in their files, this represents 25% of the workforce, it is quite important and can create a selection bias that could have an impact on the extrapolation of the conclusions of our study in case our results were completely opposite to the data of the literature.

The results of our study show that severe acute malnutrition in hospitalized children is a significant public health problem, given its prevalence (22.9%) in Kisangani City. Despite the weekly preschool consultations held in each health institution in the municipality of Mangobo to promote the preventive and promotional care of the child from 0 to 59 months to allow growth and harmonious development [22].

The distribution of children in acute malnutrition by sex, the result of our study gives 57.9% of male children and 42.1% of female children. In our study, boys outnumber girls (sex ratio = 1.4). These results are similar to those of SALL who organized a nutritional recovery study in a regional hospital in KAOLACK (Senegal). He had worked on 600 cases of severely acute malnourished children hospitalized in Kaolack from 1988 to 1992. His sample consisted of 57% of boys and 43% of girls [23]. Our results are also similar to those of the BOUBACAR study, which was conducted in the pediatric ward of Gao Hospital in Mali, and reported that out of 107 cases of severe acute malnutrition, 70% of the children were male [24]. Contrary to our results, ILBOUDO in 2004, who conducted a study in Burkina Faso on the determinants of child malnutrition, is 100 (55.87%) female compared to 79 (44.13%) male [25]. This male predominance, in our study, can be explained by the fact that, during the chosen period of our study, there would be more boys than girls in pediatric service consultations.

About age, the results of our study show that children aged between 16 and 35 months are more vulnerable to severe acute malnutrition, they represent 45.7%. In 2012 in Burkina Faso, OUEDRAOGO had organized a study on the management of acute malnutrition at the CREN of CM Saint Camille de Ouagadougou and the results, similar to ours, gave a prevalence of severe acute malnutrition at the interval of age between 15 to 32 months [26]. But the contrary results were obtained by KALIDOU, in his study of malnutrition in children from 0 to 59 months in Bamako, he found a prevalence of severe acute malnutrition (85.1%) in hospitalized children aged 6 - 23 month [27]. This could be

explained by the fact that during this period the majority of weaning takes place.

The results of our study of the distribution of children according to their nutritional status are children suffering from severe acute malnutrition (19.3%), moderate acute malnutrition (46.0%) and the risk of malnutrition (34.7%). This result is similar to that of SY O., which had organized a survey on morbidity and mortality in pediatric ward B of CHU-Gabriel Touré in 2003 and found 18.4% of severe malnutrition and 16.5% of moderate malnutrition whose weight / height ratio has been evaluated [28]. In contrast to the result of SAVADOGO who had studied malnutrition among children aged 0-5 years at the Nianankoro Fomba Hospital in Segou, Mali, and had severe acute malnutrition 27.0% and moderate acute malnutrition (73.0%) [29]. This difference in results is explained by the fact that the Ségou survey in Mali was organized before the agricultural harvest period.

From the duration of hospitalization, the result of our study gives an average duration of 36 days, approximately 1 month. This result is totally different from that of DEMBELE, which studied the evaluation of the management of acute malnutrition at the Center for Recovery and Nutritional Education (CREN) of Saint Camille in Ouagadougou; this result gave an average hospital stay of 21 weeks or 5 months [30]. We think this discrepancy is due to dispersion error because DEMBELE has been working with the data collected for one year.

Lack of appetite worsens malnutrition in the hospital, and according to our study, the main causes are vomiting (39.0%), diarrhea (24.2%) and trauma (20.6%) are disorders. Our result is similar to that of BARRY who worked on the management of severe acute malnutrition at the Gao Hospital in Mali; he found in descending order of vulnerability: anemia (32.1%), acute respiratory infection (24.2%) and diarrhea (23.1%) [31]. Generally, diarrhea is the most dangerous symptom in the case of malnutrition.

At the end of our study, we obtained 169 cases of healings (74.1%); 34 cases of death (15%) and 25 cases of improvement (10.9%). These deaths could be caused on the one hand by the marked alteration of the immune system that leads to malnutrition resulting in a high vulnerability to infections and the late reference of malnourished children makes it difficult for these patients [32]. This lethality was reported by many other TANGARA A. found (19.4%, in SANDHO, Togo [33] and SY O. found 16.7% [34]. 10.9%, this can be explained by the improvement of health or the lack of financial means.

5. Conclusion

Around the world, several studies have demonstrated the high prevalence of malnutrition in pediatric hospitals. But, the updated data of this subject in the city of Kisangani are rare. The results of our evaluation study of the prevalence of severe acute malnutrition among children aged 0-5 years in the Mangobo Health Zone from 01 January 2017 to 31 December 2018 show that severe acute malnutrition is still a health problem public by its prevalence of 22.9%.

The other results of our study are: our sample is composed of 132 male children and 96 female children or a sex ratio of 1.4; Nutritional status was 44 cases of severe acute malnutrition

(193%) and 105 cases of moderate acute malnutrition (46.0%); average hospital stay is 36 days or approximately 1 month; loss of appetite is usually caused by vomiting (39.0%), diarrhea (24.2%) and trauma (20.1%); and at the end of medical treatment, we have 74.1% of cases of cure, 10.9% cases of lost sight and 15.0% cases of death.

6. References

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