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Food consumption and nutritional status of children from 0 to 59 months in the KIMBEMBE health area in Lubumbashi / DRC

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RESUME :

D'après notre recherche sur l'alimentation et la nutrition des enfants de 0 à 59 mois s'est réalisée en République Démocratique du Congo dans la province du Haut Katanga, ville de Lubumbashi, plus particulièrement dans la zone de santé de Lubumbashi, Aire de santé de KIMBEMBE. Pour ce faire cette recherche avait pour objectif général étudié l'alimentation et la nutrition des enfants de 0 à 59 mois dans l'aire de santé de KIMBEMBE Tous ces faits considérés, nous nous sommes rendu compte des résultats suivants : 8% enfants avaient un PB compris entre 115 et 119 mm, 10,4% d'enfants avaient un indice P/T de 80% ou -2 z-score, Une mise au sein tardive environ 58,4% d'enfants de 0 à 24 mois. Des programmes d'information pour améliorer les connaissances des qualités alimentaires et nutritionnelles, de sensibilisation en matières alimentaires et nutritionnelles s'avèrent donc urgents à mettre en place pour le bien-être de nos enfants.

Mots clés : Consommation, Alimentaire, Nutrition, Aire, santé

ABSTRACT:

According to our research on the food and nutrition of children from 0 to 59 months was carried out in the Democratic Republic of Congo in the province of Haut Katanga, city of Lubumbashi, more particularly in the health zone of Lubumbashi, health benefits of KIMBEMBE. To do this, the general objective of this research was to study the food and nutrition of children from 0 to 59 months in the KIMBEMBE health area. All these facts considered we realized the following results: 8% children had a BP between 115 and 119 mm, 10.4% of children had a P / T index of 80% or -2 z-score, Late breastfeeding about 58.4% of infants 0-24 months. Information programs to improve knowledge of food and nutritional qualities, and awareness of food and nutrition matters are therefore urgently needed for the well-being of our children.

Keywords: Consumption, Food, Nutrition, Area, health

1. INTRODUCTION

The most important factors that explain the malnutrition of children are the region of the residence, the occupation of the mother, the age of the child, the standard of living, the birth rate and the religion of the mother. These factors affect food that has a direct impact on the nutritional status and health of children [1]

Recent studies have been interested in the effects of prevention on the evolution of eating behavior and the BMI. These studies are difficult to analyze because children are growing strongly. [2] It is currently established that children from 0-59 months not necessarily better than those of more than 5 years. On the contrary, these children suffer from malnutrition, severe anemia and multiple parasitic infections. [3] According to the World Health Organization (WHO) estimates, undernutrition contributes to a third party to the total mortality of the child. [4]

This problem today represents a real "threat" for public health. [5] If parts of the world, particularly in Latin America and Eastern Asia, have made spectacular progress against the malnutrition of children under five, the absolute number of malnourished children has increased generally in the world. In South Asia, one in two children suffers from malnutrition, one in three children in Africa presents a weight insufficiency, and in several countries on this continent the nutritional state of children will get smaller, that because of a shortage Food. [6]

The DRC is experiencing serious nutrition problems according to various surveys and studies carried out; these problems are complex and different from one province to another. In the Democratic Republic of Congo, food consumption remains precarious in several households. There is a relationship between the quality of the food to be consumed and the level of malnutrition. [7]

In 2011, the country recorded a national prevalence of 10.7% of global acute malnutrition and 24.4% of underweight. [8] The environment for children under two in Damé (a village in the Ivoire Cote) is favorable enough to ensure their proper development. Perennial food crops, the existence of a market in the heart of the village mean that the child can have access to a relatively varied diet. [9]

Protein-energy malnutrition in the developing country is believed to be due to food shortages resulting from poor distribution of meals throughout the day. The DRC being a developing country, we say that food conditions the nutritional status of children under five. As far as we are concerned, we will talk about the food and nutrition of children 0-59 months in the KIMBEMBE health area.

The aim of our research is to study the food consumption and nutrition of children from 0 to 59 months, to determine the feeding schedule of infants and young children and to assess the nutritional status of children from 0 to 59 months.

2. ENVIRONMENT, METHODS AND MATERIALS

2.1. Research environment

Our research took place in the KIMBEMBE health area located in the Lubumbashi Health Zone, specifically in the city of Lubumbashi in the Democratic Republic of Congo. The KIMBEMBE health area is a rural area located in the Lubumbashi health zone and is located to the north-west by the Kipushi health zone and to the south-east by the Kafubu health zone.

It is estimated in 2016 at 9,483 inhabitants; It is mostly rural and young, more than 44% are under 49 years old only 5, 4% are over 64 years old. [10] The age range of 0 - 59 months is 3.49%, 2% for 6 - 11 months and 16.9% of children 6 - 59 months it has a tropical climate characterized by alternation of two seasons, the rainy season and the dry season. Clear forest or savannah vegetation dominates the area, but by the desire to have sufficient space to build there, man has completely cleared it on purpose. [10]

The total population consists largely of idle people, farmers and a small portion of people recognized as bourgeois.

2.2. Methods

2.2.1. Type of study

As part of our research, we conducted a cross-sectional descriptive study on the diet and nutrition of children 0 to 59 months. This research was supplemented by a KAP survey of women with children from 0 to 59 months during the period from September to December 2016, i.e. 3 months.

2.2.2 Study population

The survey covered children aged 0 to 59 months and mothers or caregivers of children in this age group were questioned.

2.2.3. Sampling

- Technical

We proceeded by systematic random sampling as a technique using a sampling step of 19 households found by dividing the total population of the health zone by the total population of the KIMBEMBE health area at the using the following formula:

- $K = \frac{\mathrm{N}}{\mathrm{n}} = \frac{182842}{9483} = 19{,}2 = 19.$
- K : Pas de sondage = 19.
- N: Total population of the health zone.
- n: Total population of the KIMBEMBE health area.

- Sample size

The validity of a survey depends to a large extent on the representativeness of the sample. Our survey covered 422 children aged 0 to 59 months in the KIMBEMBE Health Area.

• Cluster sample:

The sample size was calculated from the following formula:

$$n = \frac{\mathbf{Z}\propto^2 \text{ P } (1-\text{P})}{\text{E}^2}$$

- n: sample size;

- Zα: The reduced difference which is 1.96 when the risk threshold α = 0.05%.

- P: Theoretical proportion (Prevalence) when P is not known but estimated at 50%.

- E: The precision or risk of error estimated at 0.05.

$$n = \frac{(1{,}96)^2.0{,}5\ (1-0{,}5)}{(0{,}05)^2}$$

$n = \frac{3{,}8416 \text{ x } 0{,}25}{0{,}0025} = \frac{0{,}9604}{0{,}0025} = 384$ Taking into account the 10% bias of non-respondents, our sample size is reduced to 422 children surveyed.

2.3 Data collection techniques

In order to obtain the concrete results of our investigation, we proceeded by the following different techniques:

2.3.1 Interview by questionnaire

It allowed us to administer a series of elaborate and structured questions on a card, to which mothers or caregiver 0-59 months answered. The information gathered from them was necessary informative for us.

2.3.2 Materials

- MUAC;

- Toise;

- Electronic scale ;

- Data collection sheet.

- Computer

3. RESULTS AND DISCUSSION

3.1. RESULTS

3.1.1. Sociodemographic data of children 0 to 59 months

Table I: Distribution of children from 0 to 59 months by sex

Gender	Frequency	Percent
M	289	68,4
F	133	31,6
Total	422	100

This table shows us that out of 422 children surveyed, the majority were boys.

Table II: Distribution of children according to age groups

Tranche d'âge (mois)	Frequency	Percent
[0 - 6 [	42	9,9
[6 – 12 [	61	14,4
[12 – 24 [	111	26,3
[24 - 59]	208	49,2
Total	422	100

This table shows us that out of 422 children surveyed, 208 or 49.2% were between 24 and 59 months old against 9.9% of infants.

Table III: Distribution of households according to the number of children under 5 years old.

Number of children under 5 per household	Frequency	Percent
1	47	23,9
2	62	31,6
3	53	27,1
4	21	10,7
5 or more	13	6,7
Total	**196**	**100**

This table shows that out of 196 households surveyed, 62 households or 31.6% had 2 children under 5 years old against 13 households or 6.7% which had 5 or more.

3.1.2. Nutritional status information

This figure shows us that out of 196 women surveyed, 48.9% had no knowledge of children's nutritional practices against 4.6% who had a good knowledge.

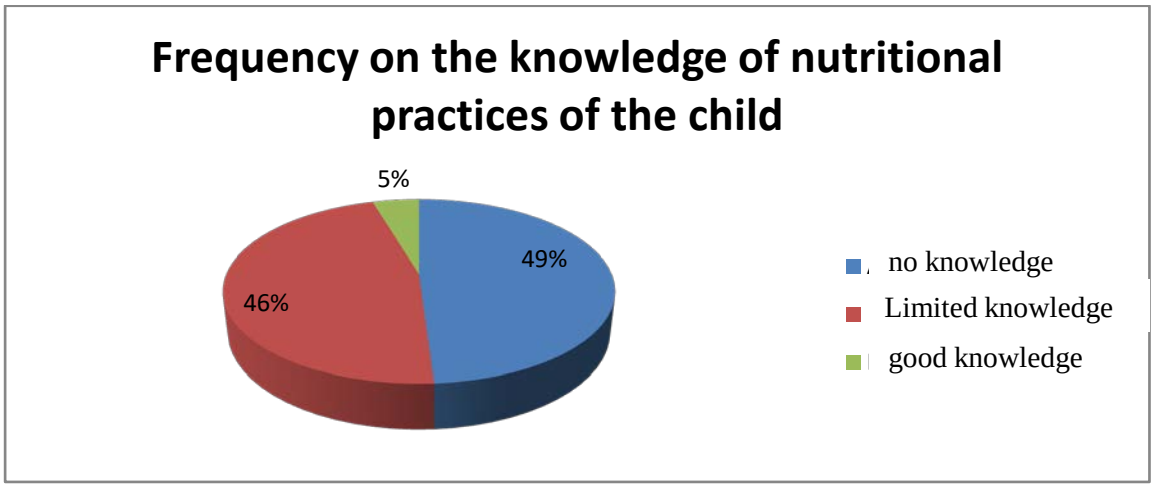

Fig. 1: Distribution of respondents according to knowledge of children's nutritional practices

3.1.3. Information on anthropometric measurements

Table IV: Distribution of children from 0 to 59 months according to MUAC

PB	**N = 422**									
	>135 mm		**120 – 135 mm**		**115 – 119 mm**		**<115 mm**		**TOTAL**	
Age (months)	**Normal**	**%**	**MAL**	**%**	**MAM**	**%**	**MAS**	**%**	**N**	**%**
[6 – 12 [	52	85,3	9	14,7	0	0	0	0	61	16,1
[12 – 24 [	85	76,5	23	20,7	3	2,7	0	0	111	29,2
[24 - 59]	143	68,7	54	25,9	11	5,3	0	0	208	54,7

This table shows that out of 111 children aged 12 to 24 months, 2.7% had a MUAC between 115 and 119 mm; while out of 208 children aged 24 to 59 months, 5.3% had a MUAC between 115 and 119 mm.

Table V: Distribution of children from 0 to 59 months according to the weight / height index or Z-score.

					Weight and height N= 422					
	90 – 100 (1 Z)		**85% (-1,5 Z)**		**80 % (-2Z)**		**<70% (-3 Z)**		**TOTAL**	
Age (mois)	**Normal**	**%**	**MAL**	**%**	**MAM**	**%**	**MAS**	**%**	**N**	**%**
[0 - 6 [	42	100	0	0	0	0	0	0	42	9,9
[6 – 12 [	52	85,3	9	14,7	0	0	0	0	61	14,4
[12 – 24 [	85	76,5	23	20,7	3	2,7	0	0	111	26,3
[24 - 59]	138	66,3	54	25,9	16	7,7	0	0	208	49,2

This table shows that out of 111 children aged 12 to 24 months surveyed, 2.7% had a P / T index of 80% or -2 Z-score while out of 208 children aged 24 to 59 months, 7.7% had a 80% P / T index or -2 Z-score.

3.1.3 Information on children's nutrition

Table VI: Distribution of children from 0 to 24 months according to the weaning age

Age de sevrage (mois)	Frequency	Percent
3	62	28,9
4	46	21,4
5	39	18,2
6	67	31,3
Total	214	100

It emerges from this table that, out of 214 children aged 0-24 months surveyed, only 67 children benefited from exclusive breastfeeding up to 6 months against 28.9% who were weaned since the age of 3 months.

Table VII: Distribution of children from 0 to 24 months according to the reason for weaning

Reason for withdrawal	Frequency	Percent
The child was crying	83	38,7
Mother's illness	16	7,4
The sick child	11	5,1
Mom moving	6	2,8
Insufficient milk quantity	31	14,4
The child has reached weaning age	67	31,3
Total	214	100

This table shows that about 53.1% of the major causes of early weaning in children are incessant crying and minimal milkiness.

The figure below indicates that out of 214 children aged 0 to 24 months surveyed, 32 children or 14.9% were breastfed at the first hour of birth against 125 children or 58.4% who were not breastfed.

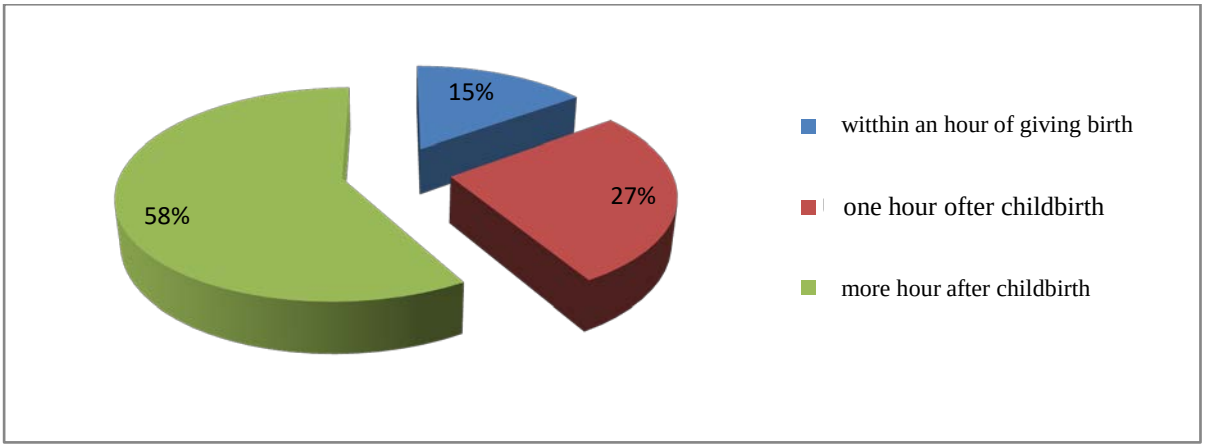

Fig. 2: *Distribution of children from 0 to 24 months according to the time of feeding at birth*

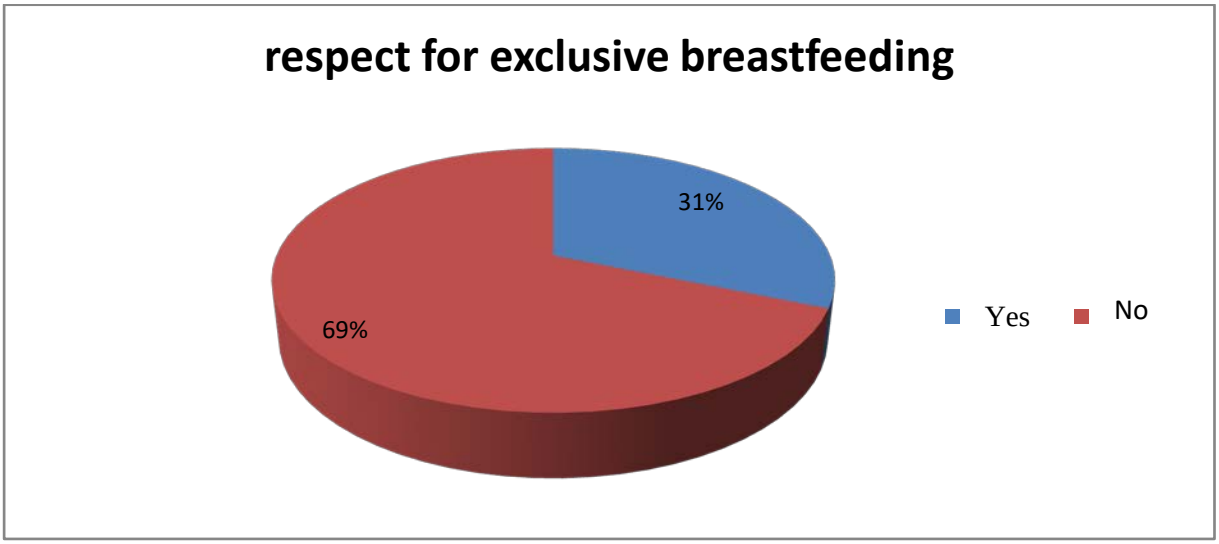

Fig. 3: *Distribution of children aged 0 - 6 months fed exclusively on breast milk*

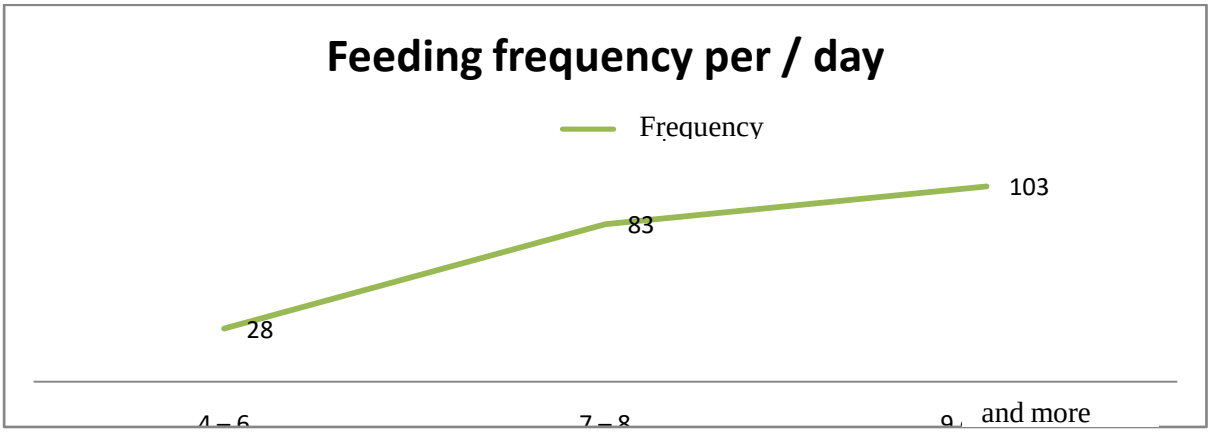

Fig. 4: *Distribution of children from 0 to 24 months according to Number of suckles per day.*

Table VIII: Distribution of children from 0 to 6 months who have not respected exclusive breastfeeding according to the amount of energy stored / day

Consumed energy (kcal)	**Frequency**	**Percent**	**Requirement recommended (kcal)**
< 700	0	0	
[700 – 720[	7	16,6	
[720 – 740]	12	28,6	700
> 740	23	54,8	
Total	**42**	**100**	

This table states that out of 42 children aged 0 to 6 months who did not respect breastfeeding, 54.8% stored more than 700 Kcal per day compared to 16.6% who stored between 700 and 719 Kcal per day.

Table IX: Distribution of children from 6 to 12 months according to the amount of energy stored per day

Consumed energy (kcal)	**Frequency**	**Percent**	**Requirement recommeded (kcal)**

[750 - 800[	48	78,7	880
[800 - 850[	5	8,2	
[850 - 900]	8	13,1	
Total	61	100	

This table shows that out of 61 children aged 6 to 12 months surveyed, 48 children or 78.7% stored between 750 and 800 Kcal per day against 5 children or 8.2% who stored between 800 and 849 kcal per day.

Table X: Distribution of children from 12 to 24 months according to the amount of energy stored per day

Consumed energy (Kcal)	**Frequency**	**Percent**	**Requirement recommeded (Kcal)**
< 700	0	0	1150
[700 - 900[	96	86,5	
[900 - 1100]	15	0	
>1100	0	13,5	
Total	111	100	

This table reveals that out of 111 children from 12 to 24 months surveyed, 96 children or 86.5% stored between 700 and 899 Kcal per day against 15 children or 13.5% who stored between 900 and 1100 Kcal per day.

Table XI: Distribution of children from 24 to 59 months who ate the meal without a snack according to the amount of energy stored per day

Consumed energy (kcal)	**Frequency**	**Percent**	**Requirement recomeded (kcal)**
< 800	11	12,3	1450
[800 - 1100[	22	24,7	
[1100 - 1400]	18	20,2	
>1400	38	42,7	
Total	89	100	

This table reveals that out of 89 children from 24 to 59 months surveyed who ate the meal without a snack, 38 children or 42.7% stored more than 1400 kcal per day.

Table XII: Distribution of children from 24 to 59 months who ate the meal with snack according to the amount of energy stored per day

Consumed energy (kcal)	**Frequency**	**Percent**	**Requirement recomeded (kcal)**
< 900	22	18,5	1450
[900 - 1200[	38	32	
[1200 - 1500]	1	0,8	
>1500	58	48,7	
Total	119	100	

This table reveals that out of 119 children from 24 to 59 months surveyed who consumed the meal with snack, 58 children or 48.7% stored more than 1500 Kcal per day against 1 child who 1200 to 1500 Kcal per day.

It emerges from this figure that out of 208 children aged 24 to 59 months, 17 children or 8.2% ate 1 meal without snack per day against 34.6% who ate 2 meals without snack.

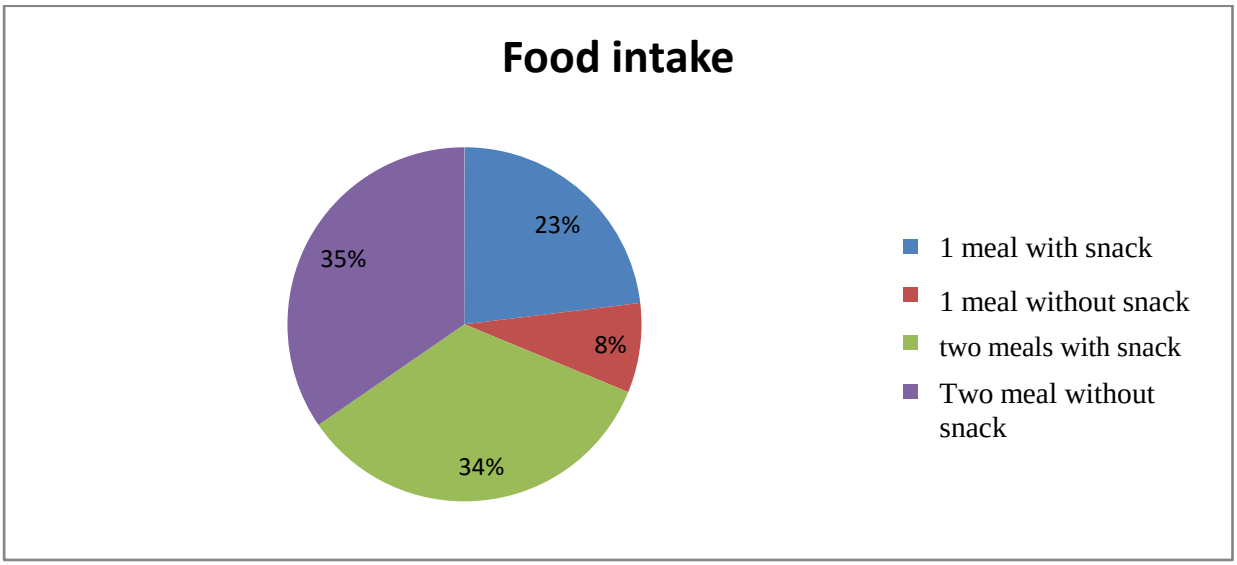

Fig. 5: *Distribution of children from 24 to 59 months according to daily food intake*

Table XIII Distribution of respondents according to energy expenditure and nutritional status

Age group (months)	**Ingestats**	**Quantity (g)**	**Consumed energy** ***(Kcal)***	**Energy expenditure** ***(Kcal)***	**Characterization**	**nutritional state**	**Effective**
0 to 6	Corn flour + Soy flour + oil + sugar + breast milk	20 + 10+ 5+5+800	742	702,19	Of < Energy consumed	Normal	42
	Arti milk + breast milk	30+800	701,6				
	Corn flour + Peanut powder + oil + sugar + breast milk	20 +10 + 5+5+ 800	732,5				
6 to 12	Corn flour + soy flour + oil + sugar + Breast milk	40 + 20 +5+5+ 800	859 ,7	790,92	Of < Energy Consomed	Normal	61
	Corn flour + Peanut powder + oil + Sugar + Breast milk	40 + 20 + 5+5+800	840,3				
	Foufou + Fish + oil + Breast milk	30+25+ 10+ 800	875,5				
	Foufou + Tomato sauce + Artificial milk	60 + 10 + 20	764				
12 to 24	Foufou + Fish + Vegetables + breast milk	60 +50 + 50 + 800	879,6	888,28	Of > Energy consomed	Risk of MAL	23
	Foufou + Meat + vegetables + breast milk	60+20 +50+800	876,6				
	Foufou + vegetables + breast milk	60 + 50 + 800	829,4				
	Rice + oil + sugar	100+10+10	1030		Of < Energy	Risk of overweight	3

					Consomed		
24 to 59 without snack	Foufou + Meat + vegetables	120à 240 + 30+ 90	813,9-1460,7	963-990,06	Of > Energy consomed	Risk of MAM	11
	Foufou+ Fish + Vegetables	120à240+ 90+90	821,4-1468,2				
	Foufou + vegetables	120à240 + 90	738,6-1384,4		Of < Energy consomed	Risk of overweight	0
24 to 59 with snack	Foufou + Fish +snack	120à 240 +30+90	888,9-1610,15	963-990,06	Of > Energy consomed	Risk of MAL	54
	Foufou + Fish+ vegetables + snack	120 +240 +90+90+ 90	896,4 - 1617,65				
	Foufou + vegetable + snack	120+240 +90+90	852,55 – 1530,15		Of < Energy Consomed	Risk of overweight	0

3.2. DISCUSSION

The results of our survey are discussed in relation to the reality encountered in the field compared to other similar studies carried out previously.

Regarding the distribution of children according to age groups (Table II) we found that children aged 24 to 59 months were in the majority, i.e. 49.2%, while those aged 0 to 6 months were less represented, i.e. 9.9 %. These results are similar to those found by [9] in his study on the nutritional status and quality of the diet of children under 24 months in the village of Damé in Côte d'Ivoire, stipulating that children from 0 to 6 months are the least met, ie 18% this is explained by the fact that in the village people are more attached to their customs that they avoid presenting infants to visitors for fear of exposing them to bad luck.

The proportions of children according to the anthropometric index P / T or z-score (Table V) gives a score of 10.4% MAM. This is explained by the fact that in children from 24 to 59 months who are most affected by this form of malnutrition, the low-fat diet is less than 10 g of fat per day instead of 24.5 g. which is recommended by the WHO / FAO (2013) which induces a loss of fat mass in these children.

According to the level of children's nutritional knowledge and practices (Fig. 1) only 4.6% had a good knowledge against 48.9% who had no knowledge of children's nutritional practices this is explained by the fact that the most women do not attend ANC, CPS, CPON

Regarding the latching after childbirth 14.9% of the children were put to the breast within an hour of giving birth (Fig. 2) results similar to those of CAMARA.J with a rate of 34.3 %. [11] This proves that our hospitals do not follow the recommendations of the Ministry of Health to the letter.

Regarding exclusive breastfeeding up to 6 months (Fig. 3) only 31.3% of children benefited from exclusive breastfeeding up to 6 months contrary to the recommendations of the infant feeding protocol. And the young child PRONANUT who recommended that children be fed exclusively breast milk from 0 to 6 months to protect them from malnutrition and other diseases to come. [12]

Similarly, the weaning of the child (Table VI) (28.9%) is early. Our results do not corroborate those found by BADIANYISHI .K which had a rate of 76.3%. This predisposes the child to illnesses in the future. [13]

Regarding the reason for weaning (Table VII) 53.1% of children were weaned due to minimal milk surge and the incessant crying of the children. These results are in line with those found by NGAYON, stating that 53.5% of children were weaned because of hunger and the minimal amount of milk expressed by crying.

Regarding the energy stored in children 0 to 6 months who did not comply with exclusive breastfeeding (Table VIII), 54.8% stored more energy than predicted by WHO / FAO or greater than 740 kcal instead of 700 kcal. [14]

This is because breastmilk is the food of choice for a child at this age, it alone provides all the energy necessary for all the child's needs. And adding other foods to it would either increase or overload it with energy. Unlike children from 6 to 12 months (Table IX) and those from 12 to 24 months (Table X), respectively 78.7% and 86.5% stored less energy than expected by the standards, i.e. 750 to 800 kcal and 700 to 900 kcal per day instead of 880 kcal and 1150 kcal. Hence the importance of giving children a high-energy complementary diet to overcome the deterioration in the quality of breast milk. [14]

The results of our study show that 34% of children aged 24 to 59 months (Fig. 5) ate 2 meals without a snack. Our results are lower than those found by Mulungulungu N. Déogracias et al. This is explained by the fact that he carried out his study in an environment comparable to ours and lack of financial means in the community. [15]

Our study revealed that 48.9% of children aged 24 to 59 months who ate the meal with a snack (Table XII) stored more than 1,500 kcal compared to those who ate the meal without a snack who stored less. This is because those who ate the meal with a snack gained a significant amount of energy than those who did not eat snacks.

CONCLUSION

According to our research on the food and nutrition of children from 0 to 59 months was carried out in the Democratic Republic of Congo in the province of Haut Katanga, city of Lubumbashi, more particularly in the health zone of Lubumbashi, health benefits of KIMBEMBE.

To do this, the general objective of this research was to study the food and nutrition of children from 0 to 59 months in the KIMBEMBE health area.

To effectively achieve these objectives, a descriptive cross-sectional study was carried out during the period from September to December in 196 households where there was at least one child aged 0 to 59 months in the KIMBEMBE health area.

The size of our sample (422 children) was systematically random with a sampling interval of 19 households.

During this research, different variables were taken into account and ethical principles were essential.

All these facts considered, we realized the following results:

- 8% children had a MUAC between 115 and 119 mm;

- 10.4% of children had a P / T index of 80% or -2 z-score;

- Late breastfeeding about 58.4% of children 0 to 24 months;

- Almost nonexistent exclusive breastfeeding, approximately 68.6% of children aged 0 to 24 months did not receive it;

- 54.8% of children from 0 to 6 months, who did not respect exclusive breastfeeding, stored more than 700 kcal per day;

- 100% of children from 0 to 6 months who have not respected exclusive breastfeeding;

- 62.9% of children aged 24 to 59 months who ate the meal without a snack.

Information programs to improve knowledge of food and nutritional qualities, and awareness of food and nutrition matters are therefore urgently needed for the well-being of our children.

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