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Social Determinants of Protein-Energy Malnutrition Children under five in Kinshasa

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Abstract: *This study focuses on the identification of the determinants of Energy Protein Malnutrition (EPM) in the peripheral area of Kinshasa. In a quantitative approach supported by a survey, anthropometric measurements (age, weight and height) are taken from 270 children under five years old. The use of the Chi-square statistical test made it possible to identify the following determinants of MPE: living in a rural environment, single-parent families and low level of education of the mother.*
Keywords: *malnutrition; protein-energy malnutrition; protein-energy malnutrition in children aged 0 to 5 years*

I. Introduction

Malnutrition in children is a widespread phenomenon in developing countries, and has significant consequences in terms of delayed physical and cognitive development, increased risk of infection and mortality. It includes deficiency conditions and also those due to excess food commonly encountered in developed countries. Although these excessive conditions appear more and more in developing countries, the deficiency conditions are almost exclusively prevalent among children. Nutritional deficiencies (protein-energy deficiency or malnutrition and micronutrient deficiencies) are the consequence of a negative food balance. They are characterized by anthropometric, clinical or biological symptoms.

At the World Summit for Children in 1990, one of the goals was to halve the prevalence of stunting by the year 2000. And achieving the first Millennium Development Goal: to eradicate poverty and hunger, will be measured, among other things, by the nutritional status of children under five.

In the same vein, the compilation of Demographic and Health Data (DHS) (MICS) carried out by the United Nations Children's Fund (UNICEF) from 1990 to 1997 shows that even developed African countries like the Sub-Saharan Africa has high rates of malnutrition among women and children. In this part of Africa, 30% of children under five are underweight while the percentage of children representing wasting or short stature are 42% and 8% respectively (DHS, 2007).

The World Health Organization report establishes that child mortality is attributed to malnutrition in 58% of general cases (WHO, 2006).

One in twelve children in the world is malnourished. In the same year more than 36 million children under five died of hunger or diseases generally linked to food insufficiency in Africa (BRIEND, 1993)

Much more, malnutrition is a complex problem due to multiple factors necessitating a multisectoral approach for its effective management, in particular the balance in terms of health, agriculture, economy, sociology, education, environment...

In the Democratic Republic of Congo (DRC), two major categories of problems seem to play a major role in the nutritional status of the child population, namely food security (including food expenditure and household purchasing power poor, poor distribution of land for food production and distribution etc.) and disastrous medical conditions. Add to this the defective hygienic conditions, close pregnancies, multiple food restrictions, the size of the

child's household, ignorance and ignorance of the child's nutritional needs….(CEPLANUT, 1993; CIN, 1994).

To do this, the World Health Organization (WHO, 2006) has set up new growth standards for children under five to monitor the evolution of child malnutrition at national and regional levels and to make comparisons between countries or regions. These standards follow the shortcomings of the National Center for Health Statistics (NCHS/WHO) reference data on child growth that had been recommended for international use since the late 1970s.

It should be noted that malnutrition in children under 2 years old is an irreversible case. Often these malnourished children grow up with health complications and fairly serious and sometimes irreversible sequelae. Their own weights are also smaller than those set by the standard.

The DRC's biggest nutritional problem is undernourishment due to insufficient caloric intake. But all over the world, various forms of malnutrition exist, leading in particular to obesity and serious deficiencies. Malnutrition has thus also been called invisible hunger or hidden hunger (WHO, 2006), affects nearly two billion children who also suffer from deficiencies in mineral salts and vitamins, which can cause fatal diseases especially in children under 0 to 5 years old.

In addition, the Democratic Republic of Congo is confronted since 1974 until our days with a deplorable economic situation such as the massive loans contracted abroad to finance overambitious investments not profitable economically and difficult to repay by the fact of the lack of investment. Real gross domestic product per capita has remained low despite the structural adjustment program supported by the World Bank. We note the rapid growth of the population caused by the rural exodus, unemployment due to lack of employment, enormous difficulties in health care, education, sanitation, the inaccessibility of consumers to basic foods and a balanced diet. This worrying situation has the purpose various problems within the population including malnutrition of children under five in the household.

Indeed, approximately 7.2% of Kinshasa children, including those in the Mount Ngafula 1 health zone, have low birth weight (less than 2.5 kg) (EDS, 2007), and are therefore likely to die within the first month of life.

The survey of household living conditions in Kinshasa in 2003, about 88% of the population are poor and many of them live in rural areas. This context of poverty has an impact on the health situation of the community. Malnutrition levels remain and are increasing day by day. Chronic malnutrition rose from 13.7% in 1993 to 27% in 2009. It stood at 39% in 2010. The corollary of these high levels of malnutrition are high mortality and morbidity rates. Infant mortality is 83‰ and infant and child mortality is 184‰. (DHS report 1993, 1998 and 2003).

These few examples show that a purely food-based approach to malnutrition cannot be sufficient, and most international players in the fight against malnutrition have had to adapt their care by developing parallel programs, ranging from psycho-social stimulation of the malnourished to their psychological care. Therefore, it is necessary to draw up a new, purely social profile of malnutrition in the outskirts of the city of Kinshasa.

The investigation of the factors associated with malnutrition is necessary in order to find the most effective means of prevention. This article falls within this perspective and pursues a double objective: First, it is a question of making use of WHO standards to redefine the profile of malnourished children on the outskirts of the city of Kinshasa, more specifically in Mont Ngafula1 health zone using an anthropometric approach. Then, a statistical approach, we try to relate the social determinants of malnutrition in children under five years.

II. Research Methods

This study is carried out in the city-province of Kinshasa, particularly in the urban-rural health zone of Mont Ngafula 1 in the Democratic Republic of Congo. Anthropometric measurements (age, weight and height) were taken from children under five years of age. The size of the sample amounts to 270 children surveyed, divided into two groups: the first concerns normal children (32 or 11.9%) and the second are malnourished children (238 or 88.1).

The children were surveyed in their respective families, apart from the observation and the interview carried out with the mothers, these children were weighed and measured in order to classify the latter by degree of malnutrition.

The survey data were presented according to the degree and classification of malnutrition, area of residence, household size, marital status of parents, food consumption pattern and level of education of the mother.

The linking of these variables and the degree of malnutrition required the use of chi-square in order to identify the most determining factors of malnutrition in this area.

III. Results and Discussion

The nutritional status of children in the Mont-Ngafula 1 health zone was classified according to the Gomez criterion (weight/age ratio).

Table 1. Classification of the nutritional status of children aged 0 to 5 in the health zone of Mont-Ngafula1

Degree and Classification		Weight/Age	Effective	Frequency %
0	Normal	90	32	11,9
1	Mild malnutrition	90 – 75	102	37,8
2	Moderate malnutrition	75 – 61	63	23 ,3
3	Severe malnutrition	≥ 60	73	27
Total			**270**	**100**

Of the 270 children surveyed, 29 or 11% are normal, 102 children or (58.7%) suffer from mild malnutrition, the rate of severe malnutrition amounts to 76 children or 23.1% against 63 children or 23.4, % with moderate malnutrition. Nearly a quarter (23.1%) of children in Mt Ngafula 1 health zone suffers from severe malnutrition.

There is no regular monitoring of the child's weight to detect it early; most often mothers give up the C.P.S very early either immediately on leaving the maternity ward or after having received one or two vaccines and only return to the consultation if the child is sick. These severely malnourished children are in a state of high risk, they can switch to a state of moderate or severe malnutrition, especially in countries where the incidence and severity of malaria or other parasitic infections are very high among this category of child. Children under 5 years old. Malnourished children represent 238 children and it is on these that our attention will be focused.

Table 2. Relationship between place of residence and degree of MPE.

Degree	**Place of residence**		**Total**
	Rural area	Urban area	
Lightweight	95	12	107
Moderate	42	37	79
Severe	46	6	52
Total	**183**	**55**	**238**

There is a difference according to the place of residence of the mother of malnourished children. Analysis of the data on a statistical basis gives a calculated Chi-square of 37.984, well above the tabular value, i.e. 5.99, at the error threshold of 0.05. This confirms the significance of the place of residence in determining the degree of MPE. The mechanisms through which the place of residence acts on the outbreak of the disease are economic and cultural. In the rural area often we meet badcustoms and eating habits, misconceptions about diseases.

Table 3. Relationship between household size and degree of malnutrition.

MPE degree	Household size		**Total**
	> 8	*< 8*	
Lightweight	96	31	127
Moderate.	49	24	73
Severe	24	14	38
Total	**169**	**69**	**238**

Given that the calculated Chi-square is 2.967 lower than the tabular Chi-square which is 5.99 at the error threshold of 0.05; the chance of having a meaningful relationship is 0.95. The null hypothesis is accepted while the alternative hypothesis is rejected. Thus the parameter "household size" has no significance in the degree of MSE.

Table 4. Relationship between the marital status of the mother and the degree of malnutrition

MPE degree	Food Mode				**Total**
	Early weaning 1 to 2 months	Distribution Intra-family	Number meals/day	Type of Meals in the household	
Lightweight	33	39	63	16	151
Moderate	10	18	22	6	56
Severe	7	13	9	2	31
Total	**50**	**70**	**94**	**24**	**238**

The contingency analysis and the application of the Chi-square formula gives the calculated value 13.136, higher than the tabular value 9.45; at the error threshold of 0.05; the null hypothesis is rejected and the alternative hypothesis is accepted. Marital status shows significance in the degree of malnutrition.

The contingency table and the application of the Chi-square formula, gives 14.729, value calculated against 12.6. Tabular value, at 0.05 error threshold. The null hypothesis is rejected. Food consumption has a significant relationship in the degree of malnutrition.

Table 5. Relationship between mother's education and degree of malnutrition.

Degree	Mother's instruction				**Total**
	Without level	Primary	Humanity	University	
Lightweight	57	39	6	10	112
Moderate	30	23	20	6	78
Severe	19	18	9	2	48
Total	**106**	**79**	**35**	**18**	**238**

MPE degree	Marital status			**Total**
	Bachelor	Bride	Divorced/Widowe	
Lightweight	68	35	16	119
Moderate.	13	23	17	53
Severe	17	26	23	66
Total	**98**	**84**	**56**	**238**

Applying the Chi-square formula gives 13.725 calculated values greater than 12.6. Tabular value at 0.05 error threshold. The null hypothesis is also rejected. The level of education has a significant relationship in the degree of malnutrition.

Discussion

The Place of Residence

The place of residence of parents revealed in this study a predominance of malnourished in rural areas than in urban areas.

The mechanisms through which the place of residence acts on the emergence of EPD are economic and cultural. Financial resources condition accessibility to infrastructures, while cultural accessibility encourages the non-use of these infrastructures both at the social and health levels. (Bringer, Richard and Mirousse; 1985).

The specific environment is a function of the socio-economic variable of the household and the cultural constraints of its members. There are bad customs and eating habits, misconceptions about diseases. In addition, the place of residence has an impact on the education given to women. For Akoto (1985) and Dupin et al (1986) African societies believe that the place of women is in the home, playing their role as wife and mother.

Other studies (Kate et al.; 1988; Carlson and Warlaw, 1990) have confirmed that in Latin America, underweight is 1.4 to 2 times higher in rural areas than in urban areas. In the D.R.C. 75% of children under five who suffer more from PEM are found in rural areas than in urban areas where the proportions are 52% of cases according to a survey conducted in 1993 by CEPLANUT.

In a disadvantaged family in rural areas, the child under 5 is more disadvantaged at the birth of another. The other children are left to the care of the elders, a grandmother, cousins... These categories of people pay little attention to the care of children, hence the outbreak of infantile parasitic diseases.

Household Size

The size of the household did not show in this study a significant influence on the occurrence of malnutrition. 155 children, or 65%, come from households with more than eight members. Mothers take into account the number of people living in the household, the meal is more quantitative than qualitative, the larger the household, the less the housewife thinks about the quality of the food.

The number of children and the total size of the household condition the behavior of the mother when buying food. The amount of money available is only used to maintain the standard of living of the members under its care and not to improve the nutritional level.

Our results do not corroborate those of other research (CEPLANUT (2000), stipulating that the household composed of 5 to 10 mmembers has more cases of protein-energy malnutrition (74.3%).

In this sense, the impact of household size results from the unavailability of food, especially animal products with high nutritional value. This reduced availability is income dependent. Large families do not have enough food for everyone or the food is of poor quality, monotonous and moreover unbalanced.

ABGESSI AND DEMON (1986) the number of children in a household should influence maternal behavior in relation to food purchases and their intra-family distribution. As such, these authors confirmed the relationship between malnutrition and household size.

The marital status of the mother

In this study, single-parent families are made up of single, widowed and divorced mothers and represent 63.5% of malnourished children.

Single-parent families constitute a group at risk. Although everyone is in the informal, resourceful for survival, the married woman has the privilege of finding household funds more easily because she is often helped by her husband. While the woman in a single-parent situation without a spouse has more responsibility combining both the functions of the father and the mother. Sometimes she adds prostitution to increase her income, which greatly exposes her either to unintended pregnancies and therefore to criminal abortions and death following sexual infections, HIV AIDS and finally to severe malnutrition of the child. she leaves an orphan.

With regard to diet and malnutrition, the study shows an influence in the occurrence of PEM. Our results corroborate other research by LACHAUD J. P. (2002), which showed that Kinshasa children are weaned early and that there is a high rate (45%) of malnutrition among children aged six months to two years.

Winnick and all. cited by Berbieri (1999) approached in the same direction and insisted that in most African countries, weaning is ensured with very sweet, poorly prepared porridge, the family meal is more carbohydrate than protein. The nutritional disorder sets in following the malabsorption of sugar and flours. The age of the child also guides maternal behaviors with regard to the supply, preparation and distribution of food according to the nutritional needs of the child.

Mother's Education

The education of the mother has always had a direct influence on malnutrition. On the other hand, the education of boys is considered more profitable than that of girls, hence the discriminatory selection of two categories.

CADWEL quoted by BERBIERI (1991) showed that in Africa in general, the burden of the child in its first years of life belongs exclusively to the mother. If the mother has not received the instruction which in principle opens and broadens intellectual horizons and forms various aptitudes, the mother will not be able to conceive the practical means of combating the dangers of infection, ensuring the preservation and preparing food, designing waste disposal management , mastering the correct principles of breastfeeding and/or the use of different varieties of infant foods. She will practice modernism more without having mastered it.

Without school education, the mother does not know how to improve and change her behavior, her eating habits. In the present study, we observe a strong correlation between the education of the mother and child malnutrition.

The information on nutritional education received by mothers at the health center during the ANC and the CPS is totally neglected and not applied by the mothers and it is a simple formality which allows them to receive food that they will sell directly after receipt instead of correcting the child's condition. This information plays a major role in the field of knowledge acquisition and adoption of behaviors that can influence the attitude of mothers towards the nutrition of their infants at a young age.

The education leads the population to be more and more aware of the need for the education of young people, especially the female sex, who is more responsible for the nutritional care of the child, but she is always marginalized. Without education, it will be difficult for the child to enter the job market and obtain an adequate remunerative job, to obtain a background of knowledge and training that will allow him to become more aware of himself. and his family.

The importance of parental education has been repeatedly confirmed in most studies on the determinants of child malnutrition.

In our results, the education of both parents confers a gain in terms of reducing chronic malnutrition in children. Only women with a relatively high level of education (secondary or higher) will be better able to combat malnutrition in their children.

As Thomas, Strauss and Henriques (1996) suggest in this term: "the influence of maternal education can be interpreted by a better understanding and reception of the information necessary to improve the health of one's child. Therefore, the quest for better health of children requires a sufficient level of education.

It is therefore obvious that the educated woman appeals more easily to medical personnel for health services, she therefore knows the importance of hygiene measures for the health of children (Berbieri, 1999) and the importance of consulting the infant.

Thus, a reduction in the malnutrition rate within a community cannot be envisaged without significant literacy in this community, especially among women.

IV. Conclusion

Energy Protein Malnutrition (EPM) is a real public health problem in the Democratic Republic of Congo, particularly in rural areas.

This study aimed to identify the determinants of PEM in children under five years old. The Chi-square statistical test was used to relate certain factors to the occurrence of malnutrition in children.

The following factors have been shown to be determinants of protein energy malnutrition in children under five years of age: place of residence (with a high risk in rural areas), marital status (particularly for single-parent families), and family education. mother (with risk of exposure in mothers with too low a level of education, i.e. primary level).

Thus we recommend to the government to urbanize the outskirts of the city of Kinshasa in order to facilitate the access of the population to the different needs; raise awareness of the consequences of single parent families; encourage and enhance the education of the female class.

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