

KNOWLEDGE OF MOTHERS ON PREVENTION OF ANAEMIA IN CHILDREN UNDER 5 YEARS OF AGE IN THE PROVINCIAL CITY OF KINSHASA, DRC

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Abstract

Background: Early management of anaemia remains a major public health issue worldwide. In Kinshasa, DRC, the delay in the management of anaemia is associated with a high mortality rate. Parents' lack of knowledge of the signs of anaemia and inappropriate attitudes have been blamed elsewhere for this delay. The aim of this study was to assess mothers' knowledge of anaemia in children aged 0-59 months in the provincial city of Kinshasa.

Methods: This was a cross-sectional study conducted in 6 health zones of Kinshasa among 639 mothers of children aged 0-59 months selected through multistage sampling. Data collection was done using a pre tested semi structured interviewer administered questionnaire and the data was analysed using SPSS version 24. Ethical approval was obtained from the Protestant University, Congo.

Results: The predominant age group was 20 to 24 years (28.0%), the majority of mothers were married (57.2%) and had completed their secondary education in 61% of cases. Less than half of the children (41.4%) had a history of anaemia at the time of the survey. The majority of mothers (92.9%) had heard about anaemia through various sources of information, including family/friends (72.9%), health professionals (18.05%), television (5.7%), radio (0.7%) and school (2.65%). More than half of the mothers (59.4%) said they had seen publicity about anaemia either at the health centre (64.5%), on television (25.5%) or on the radio (3.0%). Overall the majority of mothers (62.5%) had good knowledge of their child's anaemia. The majority of mothers (92.1%) would bring their child to the health centre in case of anaemia, 18.3% and 16.3% would give iron and iron derivatives respectively.

Conclusion: Anaemia is not an unknown disease among mothers of children under 5 years old in Kinshasa. However, the participation of health personnel in informing them about this disease remains insufficient. This level of knowledge must be improved by community awareness activities.

Keywords: prevention, anaemia, mothers, children, knowledge, Kinshasa

Introduction

Anaemia is a public health problem in many industrialized countries as well as low and middle-income countries^{1, 2}, according to the World Health Organization (WHO), it is one of the ten most sensitive problems that threaten the health of the population in the world and this, particularly in vulnerable subjects including children under five years old^{3,4}. It affects 1.62 billion people worldwide, or 24.8% of the world's population⁵, with Africa at 64.6%, South America at 40% and Europe at 17%⁶. Children under five years of age pay the highest burden, at 92% worldwide⁷, despite multiple control programmes including the distribution of Long Lasting Insecticidal Nets (LLINs), deworming and iron supplementation^{8,9,10}. The combined efforts of community and professional actors in this area seem to have little impact on the prevalence of anaemia, which is still too high and accounts for the high mortality and morbidity of children affected by it in most countries¹¹.

In terms of its harms, anaemia has serious socio-economic consequences on parents as well as society⁹, a child with anaemia is

likely to have poor aerobic exercise capacity, stunted growth, poor cognitive performance, increased susceptibility to disease, heart failure, poor immune system (with potentiation of various infections) and death^{8,9,12}. These harms are sometimes non-reversible, resulting in school absences, poor performance in school and repetition of grades. As a result, anaemia remains the leading cause of child mortality and morbidity worldwide, with 28.8% of these children residing in sub-Saharan Africa¹³.

The Democratic Republic of Congo (DRC), where under nutrition is the most common type of malnutrition, including chronic malnutrition, acute malnutrition and micronutrient deficiencies affecting mainly children¹⁴, is one of the countries with the highest child mortality rate in the world and anaemia is one of the indicators of child morbidity and mortality¹⁵. In 2004, according to the State of Health and Poverty Report (2005), in the western region of the country alone, 6% of children under five years of age died as a result of anaemia¹⁶ and yet according to a meta-analysis conducted by Scott et al. (2014), these deaths could be avoided by increasing their haemoglobin level by 1 g/L through certain simple strategies¹⁷ and

studies in several African countries have shown that a 1 g/L increase in haemoglobin (Hb) contributes to a 24% reduction in the risk of death due to anaemia^{18,19}.

In 2007, a study conducted by EDS-RDC found a prevalence of 71% of children aged 6 to 59 months with anaemia²⁰, while the most recent epidemiological data showed that almost one in two children under five years of age (47%), is affected by anaemia in the DRC to varying degrees, including 20% in the mild form, 25% in the moderate form and 2% with severe anaemia²¹. Despite multiple intervention strategies, the prevalence of anaemia is still high in the DRC after a decade.

Given that anaemia is a preventable disease²² and its early management remains a major public health issue³, effective prevention of anaemia requires good knowledge of mothers of anaemic children as well as their involvement in the management of these children²³. However, the delay in management is often due to the parents' lack of knowledge of their child's anaemia. Mastering parents' knowledge of anaemia is an element in defining a strategy that can reduce the harms of anaemia in a setting^{17,24}.

In order to contribute to the improvement of child health, we felt it was important to conduct this study which was aimed at assessing mothers' knowledge of anaemia in children aged 0-59 months in the provincial city of Kinshasa.

Methods

Study Design: This was a cross-sectional study.

Study Setting: The provincial city of Kinshasa, the capital of the Democratic Republic of Congo, was the setting for this survey. A large city with a surface area of 9,965 km² and an estimated population of 6,743,623 inhabitants²⁵ divided into 35 health zones of Kinshasa²⁶. These health zones are distributed as follows: 2 are rural, Maluku 1 and Maluku 2; 5 health zones are semi-rural (Biyela, Kikimi, Nsele, Mont Ngafula 1 and Mont Ngafula 2); the remaining 28 health zones are urban. The city of Kinshasa has a high density of 677 inhabitants per km² compared to the national average of 25 (DHS, 2014)²¹.

Inclusion criteria: All mothers with one or more children under five years of age who consented were included in the study.

Exclusion criteria: We excluded from this study mothers of children aged 0-59 months who had not given their consent, and mothers of children under five years of age with mental disorders.

Sampling

Sample size: The sample size in the general population was calculated according to Fischer's formula which is: $N = Z^2 \times P \times Q / i^2$, with Z =Smallest deviation which is 1.96; P =Proportion of children under five with anaemia in the DRC, i.e. 47%²¹, so $P=0.47$; $Q=1-P$ so $Q=1-0.47$ which equals 0.53; i =Margin of error (5% or 0.05). In numerical application, the sample size of mothers of children under five years old to be surveyed was therefore $N=383$. Applying a design effect of 1.5, we obtained 575 and adjusting for a 10% non-response rate, the size determined was 639.

Selection: The study was conducted from 10 October to 10 December 2021 in 36 streets of the city province of Kinshasa selected by multistage sampling technique within six health zones of

the city representing 1/6 of the total number of health zones in the city. The Gombe health zone was excluded as it was more of an administrative entity with several uninhabited plots. We proceeded by random probability sampling according to a multistage design. The sampling units were made up of the health zone in the first stage, the health area in the second stage, the street in the third stage, and the household in the fourth stage. The statistical units were selected by random draw. The survey took place in six health zones corresponding to 1/6 of the health zones in the city and province of Kinshasa, namely Bandalungwa, Kasavubu, Lemba, Lingwala, Masina 1 and N'djili. These were selected by a simple random draw without discount from a list of 34 health zones. In each of these six health zones, we selected three health areas from the total list of health areas in that zone using systematic sampling by calculating the sampling step. Then, in each of these health areas, we drew two streets from the total list of streets in that area by a simple random draw without replacement. Finally, in each street, we selected 18 households from the total list of streets in the health area by systematic sampling. If in a household we had more than one mother with one or more children aged 0-59 months, the oldest was considered.

Data collection: Data collection was carried out by the principal investigator assisted by two assistants. The latter had been previously trained on the general objective of the study and how to conduct the interviews during the month of August. Data collection was based on a pre-established and pre-tested questionnaires.

The level of knowledge of the population in our study was measured using a score based on 5 questions that made up the questionnaire (Definition, causes, clinical signs, treatment and prevention). Each question containing 2 assertions (yes = 1 and no = 0). The score had a minimum of 0 and a maximum of 5. Low knowledge was defined when the score was between 0 to 1, average knowledge when the score was between 2 to 3, and high knowledge when the score was between 4 to 5

Study variables: Data concerning mothers' knowledge of anaemia: definition, causes, clinical signs, the impact of anaemia on the child's health, treatment, prevention.

Statistical analysis: After encoding and checking the consistency of the data collected and transcribed in Excel 2010, they were exported to SPSS for WINDOWS version 24 for analysis. Descriptive analyses were used and categorical variables were presented as absolute and relative frequency as well as percentages.

Ethical considerations: Prior to the start of our actual investigation, the protocol of this study was submitted for validation and an authorization from the ethics committee of the Protestant University in Congo N° CEUPC0079 was obtained. Authorisation for research in the various health zones N° S M - 700/CBCD/SEC/338/NM/BCD/2021 was also obtained from the Urban Health Division of the city of Kinshasa (DPS). The eligible mothers were informed about the objectives of the study and asked to sign an informed consent form, after which they were interviewed and data collection was carried out in strict compliance with the

barrier measures taking into account the covid-19 pandemic

Results

A total of 639 mothers of children aged 0-59 months were interviewed, 31 mothers were excluded because their consents contained an identical signature and 608 mothers were included in our study. The predominant age group was 20-24 years, with 170 mothers (28.0%).

Socio-demographic characteristics

General characteristics of the study population

Table 1 summarises the socio-demographic characteristics of the mothers

Table 1: Socio-demographic characteristics of mothers (n=608)

Variable	Frequency (n)	%
Age		
15-19 years	132	21.7
20-24 years	170	28.0
25-29 years	115	18.9
30-34 years	95	15.6
35-39 years	76	12.5
40-44 years	16	2.6
45-49 years	4	0.7
Ethnicity		
Kongo	349	57.4
Ngala	78	12.8
Luba	146	24.0
Swahili	35	5.8
Marital status		
Married	348	57.2
Single	125	20.6
Common-law	116	19.1
Divorced/widowed	19	3.1
Profession		
Informal	209	34.4
Formal	293	48.2
Unemployed	106	17.4
Level of education		
Primary	19	3.1
Secondary	371	61.0
University	218	35.9
Religion		
Catholic	126	20.7
Protestant	102	16.8
Revivalist	294	48.4
Others	86	14.1

Data were expressed as absolute (n) and relative (%) frequency. The predominant age group was 20-24 years old (28.0%). Of the mothers interviewed, 57.2% were married, 20.6% were single, 19.1% were living common-law and only 3.1% were divorced or widowed. Nineteen mothers had left school at primary level, three hundred and seventy-one at secondary level and two hundred and eighteen at higher level. The proportion of Kongo mothers was the highest (57.4%). The majority of mothers were Christian and other religious denominations represented 14.1%.

Advertising of anaemia

Table 2 shows information on anaemia advertising.

Table 2: Information on anaemia advertising (n=608)

	Frequency (n)	%
Watching an advertisement about anaemia		
No	247	40,6
Yes	361	59,4
Site (n=361)		
Health centre	233	64,5
Television	92	25,5
Poster	18	4,9
Radio	11	3,0
Billboard	4	1,1
Vaccination campaign	3	1

Fifty-nine point four percent of mothers said they had seen anaemia advertising compared to forty point six percent of mothers who had never seen it. In 64.5% of cases the site of the anaemia advertisement was the health centre, television and radio in 25.5% and 3.0% of cases respectively, vaccination campaign 1% of cases and billboard 1.1% of cases.

Mothers' knowledge of anaemia

Table 3 shows mothers' knowledge of anaemia based on their different sources of information, definition, causes, clinical signs, means of prevention, risk and treatment of anaemia.

Variable	Frequency (n)	Percentage (%)
Hearing about anaemia (n=608)		
No	43	7.1
Yes	565	92.9
source of information (n=565)		
Family/friend	412	72.9
Health professional	102	18.1
Television	32	5.7
School	15	2.65
Radio	4	0.7
Knowledge of the definition of anaemia(n=608)		
Blood decrease	338	55.6
Illness	149	24.5
Don't know	42	6.9
Iron deficiency	39	6.0
Blood loss	19	3.0

Blood loss	19	3.0
Conjunctiva pallor	15	2.5
Palmo-plantar pallor	3	0.5
Vitamin deficiency	2	0.3
Liver disease	1	1.0
Knowledge of the causes of anaemia (n=608)		
Malaria	329	54.1
Malnutrition	227	37.3
Don't know	38	6.3
Iron deficiency	9	1.5
Vitamin deficiency	3	0.5
Infection	2	0.3
Knowledge of the signs of anaemia(n=608)		
Plantar skin pallor	514	84.5
Fever	6	1.0
Seizure	4	1.0
Dizziness	3	1.0
Headache	3	0.5
Oedema of lower limbs	2	0.3
Urine Coca-Cola	2	0.3
Don't know	2	0.3
Diarrhoea	1	0.2
Knowledge of how to prevent anaemia(n=608)		
Good nutrition	320	52.6
Treatment of infections	158	26
Don't know	85	14
Tomato and milk mixture	23	3.8
Herbal infusion	18	3.0
Use of LLINs	4	0.7
Knowledge of the risk of anaemia(n=608)		
Death	508	83.6
Growth retardation	120	19.7
Weight loss	110	18.1
Seizure	93	15.3
Asthenia	77	12.7
Paralysis	75	12.3
Illness	58	9.5
Loss of consciousness	32	5.3
Don't know	3	0.5
Knowledge of treatment (n=608)		
No	24	3.9
Yes	584	96.1
Type of treatment (n=584)		
Transfusion	233	39.9
Iron	182	31.2
Iron-rich food	103	17.6
Traditional remedy	42	7.2
Tomato mixture	23	3.9
Vitamin	1	0.2

Among mothers interviewed, 92.9% had heard of anaemia and their main source of information was family/friends (72.9%). Health professionals were mentioned in 18.05%, television and radio were the source of information for mothers in 5.7% and 0.7% of cases respectively, school (2.65%). More than half of the mothers (55.6%) defined anaemia as a decrease in blood, 24.5% of mothers defined it as a disease and 6.9% of mothers did not know how to define anaemia. The most common cause known by the mothers was malaria (54.1%) followed by malnutrition in 37.3% of cases. 6.3% of mothers did not know the cause of the anaemia. The majority of mothers cited at least one sign of anaemia, conjunctivo-palmar

pallor was the clinical sign most known by the mothers (84.5% of cases), physical asthenia in 9% of cases. Good nutrition was known in 52.6% of cases as a means of preventing anaemia by the mothers but 14% of mothers did not know how to prevent their child from anaemia. Use of long-lasting insecticide-treated nets (LLINs) was known in only 0.7% of cases. The majority of mothers also cited at least one risk to which the anaemic child was exposed. The most cited risk was death (83.6%).Ninety-six point one percent of mothers knew of a treatment for anaemia and thirty-nine point nine percent of mothers cited transfusion as one of the ways to treat anaemia, iron in thirty-one point two percent of cases and traditional remedy in seven point two percent of cases.

Figure 1: Less than half of children (41.4%) had previously had anaemia at the time of the study as shown in the diagram below

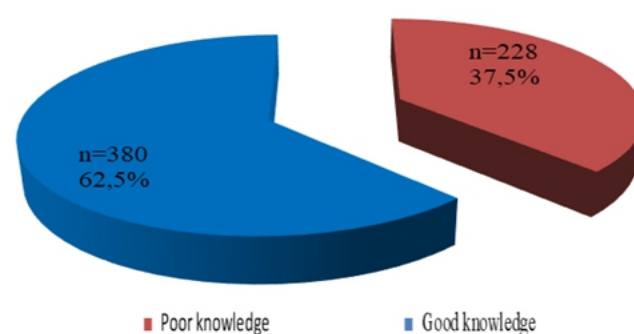


Figure 1: Mothers' overall knowledge of anaemia

Discussion

We conducted a cross-sectional study in six health zones in the provincial city of Kinshasa to assess the knowledge and attitudes of mothers of children under five about anaemia in order to contribute to improving child health in our setting.

Mothers' knowledge of their child's anaemia

Our study shows that the majority of mothers (92.9%) had already heard about anaemia through various sources of information, either family or friends (72.9%), health professionals (18.05%), television (5.7%) or radio (0.7%) and school (2.65%). The main sources of information are families, with less participation of health professionals and the media. From the above, anaemia is a pathology known to mothers in the provincial city of Kinshasa, but the low participation of the media can be explained by, among other, the constant lack of electricity in the city, the lack of interest in the media among women in general, and the lack of a health programme in the media due to the low level of staff²⁷. Health care staff participate in informing mothers in this area to a low percentage, either 18.05%, and these figures can be improved by raising the awareness of these staff at each contact during the various consultations, as health care staff remain the best source of information in terms of the quality of the information given.

Indeed, our results are better than those found in Togo where Djadou K.E et al. reported that 82.5% of mothers of children under 5 had already heard about anaemia, even though the representation of the

media, particularly television (9.2%), was higher than that found in our study²⁸. More than half of the mothers (59.4%) said they had already seen advertising about anaemia either at the health centre (64.5%), on television (25.5%) or on the radio (3%).

Overall, the majority of mothers (62.5%) had good knowledge of their child's anaemia. In addition more than half of the mothers (55.6%) had defined anaemia as a decrease in blood in the body, 24.5% of the mothers had defined it as a disease and 6.9% of these mothers did not know how to define anaemia. These figures are comparable to those found by Segbedji K.A et al, in their series they found more than half of the mothers (56.7%) who had given a good definition of anaemia²⁹.

The most known cause of their child's anaemia was malaria in 54.1% of mothers, malnutrition (37.3%). This could be explained by the fact that anaemia is the most common complication of malaria³⁰, being in a malaria endemic area where children are regularly affected by severe malaria, anaemia is therefore much more known by mothers of children under 5 years of age.

The same facts were observed by Guedenon K.G et al. in their survey where malaria and malnutrition were cited by the majority of mothers as the cause of anaemia in a different proportion 24% and 19% respectively but with a high rate of mothers who did not know the cause of the anaemia either 39% against only 6.3% found in our study³¹.

Referring to its symptoms, the majority of mothers recognised anaemia by conjunctivo-palmar pallor (84.5%) and physical asthenia in 9% of cases. These results are close to those of Kamelan T.A et al. who in their study found 90% and 5% respectively³². In relation to its prevention, good nutrition was cited by more than half of the mothers (52.6%), use of LLINs was known in only 0.7% of cases and this, despite the regular distribution of mosquito nets in households by the national malaria control programme. The existence of treatment for anaemia was known by 96.1% of the mothers and 39.9% of the mothers cited transfusion as one of the means of managing anaemia, 31.2% of the mothers cited iron and 3.9% of the mothers cited traditional remedy as treatment for anaemia. Our results are much better than those reported by Guedenon K.G et al. who found 73% of mothers of children under 5 years old who knew that treatment for anaemia exists³¹.

Limitation:

The only limitation to our study was that no documentation attesting to the age of the children was displayed by the mothers interviewed, as a result, we had limited ourselves to the mother's declaration as the age of her child.

Conclusion

Our study gave us the means to assess the current knowledge of mothers of children less than 5 years of age in the provincial city of Kinshasa. The mothers in our survey were mostly young in the 20-24 age group with good knowledge. However, the participation of health personnel in informing them about this disease remains insufficient and the media show little interest in this issue, which results in a communication deficit. This level of knowledge must be

improved by community awareness activities with good communication that can lead to a change in behaviour in view of a good management of this disease with the aim of reducing morbidity and infant mortality due to anaemia in our environment.

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