

Determinants of Food Practices and Nutritional Profile of Children Under 5 Years of Age Living in Intra-Urban Villages in the District of Abidjan

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Abstract Adequate nutrition during early childhood is fundamental for the harmonious development of each child. It is scientifically known that the period between birth and age five is a critical time for optimal growth, health and development of the child. The general objective of this present study was to evaluate the eating habits and nutritional status of children aged 0 to 5 years living in intra-urban villages in the Abidjan district. To achieve this objective, information relating to the feeding method of children aged 0 and 5 (breastfeeding, weaning, complementary feeding, solid food) was first collected. The nutritional status of these children (weight, height, upper arm circumference, nutritional diseases) was then determined. Finally, the links between the diet and the general nutritional status of these children were evaluated. The results showed that the majority of children surveyed had educated parents with 35.6% of fathers and 44% of mothers having a secondary level and 32.4% of fathers and 18.4% of mothers having a higher level. The majority of households had a low (45.6%) or average (45.2%) standard of living. The majority of children had consumed colostrum (76%), nearly 27.6% had benefited from exclusive breastfeeding and had consumed local fermented porridges (44%) as complementary foods, generally before the age of 6 months (64.2%). Most of the children (80%) had a normal nutritional status and were mostly not affected by diarrheal diseases (88%) and vitamin A deficiency (97.6%). This good state of health of the majority of children, despite the average economic situation of their parents, is due to the good choices made by mothers, particularly in terms of the type of breastfeeding and the choice of complementary foods provided.

Keywords: Nutritional status, children aged 0 to 6 months, intra-urban villages, Abidjan district

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1. Introduction

From birth to 6 months of age, breast milk contains all the nutrients necessary for the healthy growth of the infant. From the 6th month, milk is no longer sufficient to cover all of the infant's nutritional needs [1], and the deficits created must be filled by the introduction of complementary foods. During this so-called weaning period, the child gradually moves from a liquid and milk diet to a diversified diet, semi-liquid then solid [2]. Exclusive breastfeeding during the first six months, adequate complementary feeding and feeding practices until the age of five are recommended to ensure harmonious growth and development of the child during this crucial period [3]. Failure to follow all of these recommendations leads to malnutrition in children.

The World Health Organization (WHO) defines malnutrition as "an imbalance between nutrient and energy intake and the body's needs for growth and specific

functions [4]. Malnutrition, especially in children, manifests itself clinically or is only detectable by biochemical, anthropometric, or physiological analyzes [5]. In Ivory Coast, 23% of children under five years old are affected by malnutrition with 8% having the severe form, 8% acute malnutrition and 2% severe malnutrition [6].

This is unfortunately due to WHO recommendations relating to breastfeeding, weaning, consumption of semi-liquid and solid foods which are not strictly followed by mothers in both urban and rural areas. This is one of the causes of thousands of deaths of children under five years old each year [7]. What about mothers living in intra-urban villages in the Abidjan district? The general objective of this study was to research the explanatory factors of the nutritional status of children aged 0 to 5 years in certain intra-urban villages of the Abidjan district in order to make available to public authorities and stakeholders involved in the field of child nutrition, knowledge enabling them to improve strategies and programs to combat child malnutrition. Specifically, the aim was to determine the socio-economic characteristics

of households living in these areas, to research the determinants of the feeding practices of children aged 0 to 5 years and then to research the interactions between the socio-economic and nutritional characteristics and the nutritional status of these children.

2. Materials and Methods

2.1. Survey Sheets

The survey was carried out using a questionnaire which had 3 sections.

Section 1: Socioeconomic and demographic characteristics of parents and children which provided information on the site of residence, the profession of the parents, the estimate of the standard of living of the households, the number and sex of children aged 0 to 5 years in housekeeping, etc.)

Section 2: Food practices for children aged 0 to 5 years which provided information on breastfeeding, weaning, complementary feeding of children, etc.)

Section 3: Nutritional status of children aged 0 to 5 years which provided information on anthropometric parameters, indicators of nutritional deficiency)

2.2. Survey of Children Aged 0 to 5 in Households

2.2.1. Type and Period of Study

This is a retrospective and prospective study which took place over 2 months, from March 15 to May 15, 2024.

2.2.2. Site and Study Population

The study took place in five (5) villages (Kouté, Abobo Baoulé, Abatta, Abobodoumé, Attécoubé) located within municipalities in the Abidjan district. It affected a total of 280 households. Children belonging to the desired age group were included. Families who did not give their consent were excluded.

2.2.3. Sampling

The sample size was determined by the following formula

$$n = \frac{T^2 * P(1 - p)}{m^2}$$

n= required sample size (per neighborhood);

T= 95% confidence level (typical value of 1.96);

P= Number of households housing children under 5 years old in Côte d'Ivoire estimated at 3,696,301 or 12.6% nationally (RGPH, 2021)

m= margin of error at 5% (typical value of 0.05)

In total, 845 children aged 0 to 5 were surveyed, including 169 children in each of the intra-urban villages.

2.2.4. Conduct of the Investigation

Upon arrival in the households and after ensuring the presence of the children and the mother corresponding to our study population, an informed explanation was made to the parents and then their consent was requested. The

survey sheets were completed by the parents (the mother) then the measurement of the upper arm circumference of the children) concerned was carried out using a 26 cm bracelet (MUAC). The children's weight was measured using an electronic scale. To measure the size, a one meter tape measure was used.

2.2.5. Statistical Analyzes

The data collected was analyzed using IBM SPSS 20.0 software at the 5% threshold.

3. Results

3.1. Socioeconomic Characteristics of Surveyed Households

3.1.1. Socioeconomic Characteristics of Parents Responsible for Households

Table 1. Socioeconomic characteristics of respondents

	Effective	Proportion (%)
Household standard of living		
Weak	127	45.6
Average	125	45.2
Pupil	28	10.2
Parental education level		
Fathers	None	22.8
	Primary	08.9
	Secondary	35.7
	Superior	32.4
Mothers	None	26.4
	Primary	11.1
	Secondary	44
	Superior	18.5
Parents' occupations		
Fathers	Driver	13.2
	Trader	9.6
	Teacher	4.3
	Others	72.9
Mothers	Housewife	22.4
	Shopkeeper	26
	Hairdresser	07.1
	Others	44.3
Number of children aged 0 to 5 in the household		
1	682	81
2	47	11
3	23	08
Sex of children aged 0 to 5		
Male	456	54
Female	389	46

Table 1 presents the socio-economic characteristics of the households surveyed. The results show, on the one hand, that 45.6% of households had a low standard of living and on the other hand, 45.2% had an average standard of living. Parents were mostly educated with 35.7% of fathers and 44% of mothers having a secondary education. The results also indicate that 32.4% of fathers and 18.5% of mothers have a higher level. However, 26% of mothers were traders and 22.4% housewives while

13.2% and 9.6% of fathers were drivers or traders. In total, 89% of households had only 1 child aged between 0 and 5 years old who were predominantly male (54%) ;

3.1.2. Determinants of the Feeding Practices of the Children Surveyed

3.1.2.1. Breastfeeding and Weaning of the Children Surveyed

Table 2 presents the distribution of feeding practices (breastfeeding and weaning) of the children surveyed. The results indicate that 56.4% of children benefited from mixed breastfeeding compared to 27.6% from exclusive breastfeeding and 15.6% from artificial breastfeeding. They all practiced these different types of breastfeeding until the age of 6 months and older. Colostrum, on the other hand, was consumed by 76% of children compared to 24% who did not consume it. Half of the children, 50%, were weaned after more than a year compared to 30% and 73.1% at an age between 6 months and 1 year after a suitable feeding time. Few children (20.4%) were quickly weaned for refusing to consume their mothers' milk. Also, hygiene measures during the preparation of weaning foods were respected by mothers of several children (68%).

Table 2. Distribution of feeding practices (breastfeeding and weaning) of the children surveyed

	Effective	Proportion (%)
Type of breastfeeding		
Exclusive breastfeeding	233	27.6
Artificial breastfeeding	132	15.6
Mixed breastfeeding	480	56.8
Duration of breastfeeding type (months)		
Exclusive breastfeeding	Stopping before 6 months	0
	Stopping at 6 months or more	233
Artificial breastfeeding	Stopping before 6 months	0
	Stopping at 6 months or more	132
Mixed breastfeeding	Stopping before 6 months	0
	Stopping at 6 months or more	480
Colostrum		
Colostrum consumption	642	76
No consumption of colostrum	203	24
The child's weaning age		
Not yet weaned		169
Between 6 months and 1 year		253
More than 1 year		423
Suitable (6 months)		618
Weaning time	Early (before 6 months)	57
	Not weaned	170
		73,1
Reasons for withdrawal		
Insufficient milk	95	14
Refusal of the child to breastfeed	138	20,4
Other reasons	443	65,6
Hygiene measures during weaning		
Strict compliance with hygiene measures	460	68
No strict compliance with hygiene measures	216	32

3.1.2.2. Consumption of Complementary Foods and Solid Foods by the Children Surveyed

The consumption of complementary foods and solid foods by the children surveyed is presented in Table 3. The results presented in this table show that 64.8% of children started consuming complementary foods before the age of 6 months compared to 40.3% who stopped consuming them between 1 and 2 years old. Furthermore, the results also show that 64% of mothers respected hygiene measures during the preparation of complementary foods. The most consumed solid foods were local fermented porridges (44%) compared to 39.2% of imported infant flours. Complementary foods were served at least 3 times a day to more than half of the children (56%), which resulted in the nutritional and energy needs of 74% of the children being met. Nearly half of the children (45.2%) were still breastfed while those aged 1 year and over had consumed solid foods at a frequency of 3 times a day (29.1% and 25.7%), respectively (38.8%) maximum.

Table 3. Consumption of complementary foods and solid foods by the children surveyed

	Effective	Proportion (%)
Age of introduction of complementary foods		
Before 6 months	548	64.8
After 6 months	297	35.2
Age of stopping consumption of complementary foods		
Still breastfed	382	45.2
Between 6 months and 1 year	122	14.4
Between 1 year and 2 years	341	40.3
Hygiene measures during the preparation of complementary foods		
Strict compliance with hygiene measures	541	64
No strict compliance with hygiene measures	203	24
Others (no complementary foods)	101	12
Type of porridge used as complementary food		
Fermented local porridges	372	44
Imported infant flour	331	39.2
Others	142	16.8
Number of porridge consumed per day		
2	105	12.4
3	473	56
4	111	13.1
+ 4	156	18.5
Satisfaction of nutritional and energy needs by the porridges served		
All needs met	343	74
All needs not met	120	26
Age when the child begins to consume solid foods		
1 year	135	29.1
More than 1 year	119	25.7
Still breastfed	209	45.2
Food bans linked to ethnic or religious affiliation		
Food bans	93	20
No food bans	370	80
Frequency per day of consumption of solid meals by the child		
2 times	124	26.8
3 times	159	34.4
More than 3 times	180	38.8

3.1.3. Profile of the Children Surveyed

3.1.3.1. Distribution of the Nutritional Status of the Children Surveyed

Table 4 presents the distribution of the nutritional status of the children surveyed. The results show that 80% of these children had normal nutritional status and 20% had moderate acute malnutrition. No child was affected by severe acute malnutrition. Nearly 20.4% of children had iron deficiency, 88% had no diarrheal diseases and 97.6% had no vitamin A deficiency.

3.1.4. Interactions Between Some Socioeconomic Characteristics, Diet and Nutritional Status of Children

3.1.4.1. Interactions Between Socio-economic Characteristics and the Nutritional Status of Children

Table 5 presents the interactions between socioeconomic characteristics and the nutritional status of the children surveyed. Statistical analysis of the data showed that only the standard of living of households had an impact on the nutritional status of children. The probability value (P) which was 0.01 is greater than 0.05 and therefore

significant. Thus, children living in households with a low standard of living (27.63%) were the most affected by malnutrition.

3.1.4.2. Interaction Between the Parameters Studied and the Nutritional Status of Children

Table 6 presents the interactions between some parameters studied and pathologies affecting children. Statistical analysis of the data showed that the type of breastfeeding and colostrum consumption had an influence on the occurrence of iron deficiency in children with probabilities (P) equal to 0.03 and 0.04 respectively. Children who benefited from artificial and mixed breastfeeding and those who did not consume colostrum were much more affected by anemia. Compliance with hygiene measures during weaning and during the preparation of complementary foods had an influence on the occurrence of diarrheal diseases in children with respective probability P values of 0.015 and 0.012. Children whose mothers did not strictly respect hygiene measures during weaning and during the preparation of complementary foods were much more affected by diarrhea. There was no interaction between the parameters studied and the occurrence of vitamin A deficiency. All P values were greater than 0.05.

Table 4. Distribution of the nutritional status of the children surveyed

		Effective	Proportion (%)
Nutritional deficiencies in children			
Iron	Iron deficiencies	172	20.4
	No iron deficiency	673	79.6
vitamin A	Vitamin A deficiencies	20	02.4
	No vitamin A deficiency	825	97.6
Diarrheal diseases		101	12
No diarrheal diseases		744	88
Nutritional status of children			
Normal nutritional status		676	80
Moderate acute malnutrition		169	20
Severe acute malnutrition		0	0

Table 5. Interactions between socioeconomic characteristics and nutritional status of children

		Nutritional status of children (%)		P
		Nutritional status normal	Malnutrition Moderate acute	
Gender of child	Male	51.09	05.45	0.22
	Female	40.91	02.55	
Age of child	Less than 1 year	20.15	04.62	0.40
	Between 1 year and 2 years	34.45	04.30	
	Between 2 years and 3 years	30.40	06.08	
Household standard of living	Weak	16.56	27.62	0.01
	Average	42.8	03.00	
	Pupil	10.58	01.34	
Type of breastfeeding	Exclusive breastfeeding	26.98	02.04	0.52
	Artificial breastfeeding	14.81	03.03	
	Mixed breastfeeding	48.20	05.04	
Weaning age	Not yet weaned	04.23	04.55	0.11
	Between 6 months and 1 year	70.59	10.21	
	More than 1 year	10.05	02.11	
Number of porridge consumed per day	2	36.89	08.40	0.22
	3	04.01	05.00	
	4	18.20	03.20	
	+ 4	20.90	04.40	

Table 6. Interactions between some parameters studied and nutritional deficiencies

		Pathologies affecting children					
		Anémie (%)	P	Deficiency in vitamin A	P	Diarrhea	P
Study site	Kouté	04.90	0.315	0	0.523	02.17	0.217
	Abobo-Baoulé	29.91		2		05.39	
	Abatta	05.86		0		02.86	
	Abobodoumé	09.24		0.66		03.04	
	Attécoubé	19.69		0.34		07.54	
Type of breastfeeding	Exclusive breastfeeding	11.98	0.03	0.05	0.255	01.78	0.673
	Artificial breastfeeding	14.81		0.01		02.74	
	Mixed breastfeeding	18.20		0.02		04.48	
Colostrum	Colostrum consumption	15.75	0.04	0.06	0.537	01.74	0.431
	No consumption of colostrum	54.24		0.04		02.26	
Hygiene during weaning	Strict compliance with hygiene	07.87	0.721	0	0.401	02.61	0.015
	No strict compliance with hygiene	12.12		0,0		07.39	
Preparation of complementary foods	Strict compliance with hygiene	06.96	0.201	0.03	0.735	03.39	0.012
	No strict compliance with hygiene	10.03		0.07		11.61	
Porridge type	Fermented porridges	44.09	0.03	0.10	0.337	06.66	0.111
	Imported infant flour	22.90		0.66		01.66	
	Others	33.01		0.34		03.68	

4. Discussion

The general objective of this study was to research the explanatory factors of the nutritional status of children aged 0 to 5 years in intra-urban villages in the Abidjan district. To do this, a survey was carried out in five (5) different villages in Abidjan, namely Abatta, Abobobo Baoulé, Attécoubé, Abobodoumé and Kouté. The socio-economic and demographic characteristics of the parents of these children were determined, the determinants of the feeding practices of these children (breastfeeding, weaning, complementary feeding, solid foods) were then sought, then the nutritional status of these children (risk of malnutrition), nutritional deficiencies: Anemia, diarrheal diseases) was evaluated.

In terms of the socio-economic and demographic characteristics of the parents of these children, the results showed that of all the households surveyed, the majority had an average and low standard of living and several parents of these children were educated. Most of the mothers were unemployed, i.e. housewives. Illiteracy or the low level of education that characterizes housewives could lead to a lack of knowledge, particularly in terms of good nutritional practices. Which would be a risk for their children because it could lead to different types of malnutrition [8]. The high proportion of mothers working in commerce is justified by the fact that, although they were not able to complete their schooling, they chose this activity to financially support their different spouses [9]. These results agree with those of the study conducted by the [10] in Côte d'Ivoire which showed that more than 80% of traders were women.

In terms of the determinants of the feeding practices of these children, the results showed that mixed breastfeeding was the most practiced in these different

households. This is consistent with the results of the study conducted by [11] which showed that in Wê country (Côte d'Ivoire), mixed breastfeeding was widely practiced. This choice may be due to the fact that mothers are not sufficiently informed or for beauty reasons.

The results also showed that most of these mothers from these villages had given colostrum to their child. Which is in line with recommendations [12]. Concerning weaning times, the results showed that the majority of these households surveyed had weaned their children after 12 months with a suitable weaning rate of 73.2%. This implies that the majority of these women had breastfed their children until almost two years old, as recommended by the World Health Organization [13], with the introduction of complementary foods from the 6th month [14]. The porridges most used by these households were local fermented millet or corn porridges. These results are consistent with those obtained by [15], who showed that porridge, commonly prepared with corn flour, appears to be the only daily food offered to children by at least half of the mothers. This porridge has a significant energy value. Additionally, these cereal-based porridges contain anti-nutritional factors that limit the bioavailability of nutrients. This would partly explain the good nutritional status of children.

Regarding the nutritional status of the children, the results showed that 80% of them were in good health. This can be explained by the good follow-up of the recommendations of international authorities (WHO, UNICEF) by the majority of mothers. Indeed, households mainly adopted mixed breastfeeding and also respected the weaning periods and the age of introduction of complementary foods. According to the study carried out by [12], the rate of exclusive breastfeeding is very low and stunting is common in many countries such as Ivory Coast, Djibouti, Niger and Chad. Overall, 20.4% of households

surveyed, children had iron deficiency. On the other hand, most of these children did not develop diarrhea problems. The present study revealed a prevalence almost half that recorded globally, which stands at 47%, or 293 million preschool children worldwide [16].

With regard to children's health, the study of the links between certain socio-economic characteristics and nutritional deficiencies has been carried out. The results revealed a statistically significant correlation between the type of breastfeeding, colostrum consumption, compliance with hygiene during weaning, compliance with hygiene during the preparation of complementary foods and the occurrence of anemia and diarrheal diseases. Indeed, this could be explained by the fact that breast milk is the only food truly adapted to the needs of newborns and infants during the first months of life. It provides, in an appropriate form, carbohydrates, proteins, lipids, minerals and most of the vitamins necessary for the baby's development. If some mothers are hesitant about colostrum, it is out of ignorance or because of its yellowish color. Many women refuse to breastfeed their children immediately because of the yellowish color of the first milk called colostrum that the breasts secrete just after birth. However, studies including those of [17] have shown that colostrum is highly beneficial for infants because it provides elements which constitute the child's first immunization.

These different interactions observed could also be explained by the results of the work of [18] and those of the [19] which indicated that the risk factors for acute malnutrition are among others: the type of breastfeeding, the consumption of colostrum, respect for hygiene during weaning and the preparation of complementary foods.

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