American Journal of BioScience
2023; 11(1): 21-26
http://www.sciencepublishinggroup.com/j/ajbio
doi: 10.11648/j.ajbio.20231101.13
ISSN: 2330-0159 (Print); ISSN: 2330-0167 (Online)

Comparative Study of Breastfeeding Practices for Infants Aged 0 to 6 Months in the Communes of Abobo, Bingerville and Yopougon (Abidjan, Ivory Coast)

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To cite this article:

Adepo Yapo Prospère, Atto Virginie, Fofana Ibrahim, Kati-Coulibaly Séraphin. Comparative Study of Breastfeeding Practices for Infants Aged 0 to 6 Months in the Communes of Abobo, Bingerville and Yopougon (Abidjan, Ivory Coast). *American Journal of BioScience*. Vol. 11, No. 1, 2023, pp. 21-26. doi: 10.11648/j.ajbio.20231101.13

Received: January 30, 2023; **Accepted**: February 27, 2023; **Published**: March 9, 2023

Abstract: This work was carried out in the localities of Abobo, Bingerville and Yopougon with the aim of comparing the complexities of exclusive breastfeeding of newborns from birth to 6 months with a view to identifying high frequency difficulties and providing efficient solutions for its implementation. In each of the localities, a descriptive and analytical cross-sectional study was conducted on 200 low-income female households. The survey was conducted from October 2020 to February 2021. After the survey, it was found that the difficulties related to the decline of exclusive breastfeeding are related to the insufficient production of breast milk, the daily occupation of the mother, the precarious health status of the mother. Exclusive breastfeeding ensures the quality and quantity of breast milk to guarantee infant food safety and the competitiveness of breast milk compared to artificial and mixed milk. Availability and use of food plants among breastfeeding mothers through the production of breast milk could be a means of combating acute and chronic malnutrition in young children and very premature babies. Recommendations related to the identified problems will allow first improve the production of breast milk. Secondly, the availability of breast milk for infants could significantly reduce the prevalence of child malnutrition and could constitute an approach to reach the challenges of the WHO and UNICEF; that is to say to feed the newborn from birth until six months only with breast milk, also the possibility of giving breast milk to the young child from six months until thirty months. Good practices of exclusive breastfeeding could contribute to the reduction of child malnutrition and to a lesser degree that of the breastfeeding mother.

Keywords: Exclusively Breast-Feeding, Malnutrition, Edible Plants, Rural Women

1. Introduction

Food insecurity is prevalent in many parts of the world due to environmental and socio-economic conditions that limit access to sufficient, healthy and nutritious food to meet the energy and life needs of populations [1, 2]. The malnutrition of mothers and children in underdeveloped countries is becoming more and more of a scourge for public authorities, with the corollary of a reduction in the population's capacity for economic and social development efforts. Generally in rural areas in these regions, the nutritional status (nutrient deficiency) of vulnerable people (newborns and young children) remains of great concern [3]. Child malnutrition according to the World Health Organization is a deficiency or excess in a child's energy and nutritional intake [4]. It is caused by a wide range of factors, both pathological and socio-economic. However, the nutritional factor is de facto

the main cause of this scourge by creating a pathological context favorable to the appearance of child malnutrition [5]. The World Health Organization (WHO) has the function of leading and coordinating global health within the United Nations system. According to this organization, the advice regarding the duration of breastfeeding is as follows: "Infants should be exclusively breastfed for the first six months for optimal growth, development and health. After six months, given their changing nutritional needs, infants should consume safe and nutritionally adequate complementary foods while continuing to breastfeed for up to two years or longer." [4]. In addition, the beneficial effect of exclusive breast milk for young children in particular and for the most at-risk children such as very premature infants through the primary breast milk that is colostrum, is widely recognized worldwide [6]. Breastfeeding is also beneficial to the mother's health; with low risks of breast and ovarian cancer and type 2 diabetes [7].

However, feeding a newborn exclusively breast milk is the act of giving only the mother's milk from birth to six months without the use of any drugs. For UNICEF, exclusive breastfeeding consists of "giving the infant all colostrum, rich in vitamin A and anti-infectious factors (immunoglobulins), from birth, and feeding only breast milk at all times during the first six months unless prescribed by a doctor.

According to the WHO, infants should be fed only breast milk for the first six months after birth and then partially breastfed for up to two years [8]. According to the same organizations, in industrialized countries the average exclusive breastfeeding rate for infants under 4 months of age is 35%, in favor of bottle feeding of processed cow's milk.

In Africa, breastfeeding is practiced in 97 to 99% of cases at birth. However, exclusivity is still not respected during the first 4 to 6 months of life [9].

In traditional African, Asian and South American rural areas, breastfeeding is a very important part of a woman's self-esteem. However, the belief that "bad colostrum" can be an obstacle to exclusive breastfeeding because it is wrongly considered dirty. Socio-cultural reasons such as the loss of traditional values, the migration of families to the cities, the delay of the first feeding, and the abusive advertisements of artificial milk manufacturers can explain this situation in our regions [10].

In underdeveloped countries, undernutrition remains a nutritional scourge in both infants and young children [3]. Exclusive breastfeeding rate although having tripled from 4% in 2006 to 12% in 2012 in Ivory Coast, remains far from the 50% targets to be reached by 2025 [3] due to reasons of insufficient breast milk production among breastfeeding mothers [11], however breastfeeding remains a public health priority [3, 12].

Some authors have listed the difficulties related to the practice of exclusive breastfeeding [13, 14], and then related solutions have been indicated, however, these solutions remain insufficient. Thus, this work, which aims to evaluate the main difficulties related to the practice of exclusive breastfeeding in infants from 0 to 6 months and in very premature infants, was initiated with a view to seeking significant and sustainable solutions, on the one hand, and their popularization among breastfeeding women, on the other. Specifically, the aim is to characterize the socio-demographic state of the survey, to identify the main difficulties of the practice of exclusive breastfeeding and to provide significant and sustainable solutions.

2. Materials and Methods

2.1. Materials

In each locality, 200 women were recruited to constitute the sample for our survey. In addition, a survey form containing questionnaires was submitted to the women surveyed.

2.2. Methodologies

2.2.1. Framework of the Study

Our study took place in the communes of Abobo, Yopougon and Bingerville. Abobo is one of the thirteen communes of the district of Abidjan, Côte d'Ivoire. It is located in the northern sector of the district of Abidjan at 52600 North and 45100 West. Abobo is bounded by the town of Anyama to the north, by Williamsville, Adjamé and the Deux-Plateaux district of Cocody to the south, to the east by Angré-Cocody and to the west by the Banco forest. It is one of the most densely populated communes in the district (about 1500000 inhabitants) covering an area of 9000 ha (90 km^2), with a density of 166 inhabitants per hectare. It is home to the Banco 2 railway station, on the Abidjan-Niger railway line linking Côte d'Ivoire to Burkina Faso, as well as a bus station.

Yopougon is the largest commune of the Autonomous District of Abidjan and is located in the south of Côte d'Ivoire. With a population counted at 1071543 inhabitants in 2014, Yopougon is the largest commune, not only of the Ivorian economic capital (Abidjan), but also of the country (Côte d'Ivoire). Known for its popular atmosphere and its many maquis, Yopougon nicknamed "Yop City" plays an important role in the life of Abidjan, as a residential but also industrial district. It is located between the Banco forest and the Ebrié lagoon, in the western part of the geographical area of Abidjan North, a little out of the way. Yopougon covers an area of 153.06 km^2 and is bounded to the north by the communes of Abobo and Anyama; to the south by the Ebrié Lagoon; to the east by Attécoubé and to the west by Songon.

Bingerville is a city located in the south of Côte d'Ivoire, on the edge of the Ebrié Lagoon. It belongs to the Autonomous District of Abidjan. The demography is estimated at 91319 inhabitants, the languages spoken are French and Ebrié. It covers an area of 2119 km^2. Its geographical position is latitude north 5021.3486' and longitude west -3053.1222'. It is surrounded by cities such as Alépé, Abidjan, Anyama and Grand-Bassam. The city is characterized by forest vegetation like most of the southern

regions of Côte d'Ivoire. The flora is varied and contains species that are disappearing due to the development of the habitat. The main agricultural activities are: the cultivation of oil palms, the cultivation of cassava and the cultivation of rubber trees.

2.2.2. Type, Duration and Population of Study

This is a descriptive cross-sectional study on breastfeeding knowledge and practices. Our survey took place from October 2020 to February 2021. The inclusion criteria concerned breastfeeding mothers from low-income neighborhoods. The exclusion criteria were related to refusal to participate in the study.

2.2.3. Conduct of the Survey

It consists of interviewing women from a pre-designed survey form. The sampling consisted of recruiting women from low-income households as we met them.

We looked for the mothers' marital status, level of education, their knowledge of breastfeeding, i.e., the time of first breastfeeding, the duration of exclusive breastfeeding, the advantages of breast milk, and the way their children are fed.

It involves interviewing women on the basis of a pre-established fact sheet. The sampling was to recruit as we met with low-income housekeepers.

The mother's marital status, educational level, knowledge of breastfeeding, i.e. time of first breastfeeding, duration of exclusive breastfeeding, benefits of breastmilk, and the feeding pattern of their children were sought.

2.2.4. Entering and Verifying the Accuracy of Our Survey Data Entry

Each evening after the fieldwork, the principal investigator and the two interviewers were responsible for checking the questionnaires before they were entered. All questionnaires were double-checked first by the interviewers and then by the investigator to avoid missing data and inconsistencies. This allowed us to detect, for each interviewer, certain collection errors and to immediately question the person responsible in order to improve the quality of the data. Then, in case of inconsistency or when certain errors were found, the latter communicated to us the number of the questionnaire that we immediately sought to verify. The final verification was done by the lead researcher [15].

2.3. Statistical Analysis

The survey forms were filled out using an Excel spreadsheet. The collected data were subjected to a descriptive analysis. The experiments carried out allowed for the collection of data. A NEWMAN- KEULS test with a classification criterion at the 5% threshold was performed to evaluate the significant difference in means. The test was performed using Statisticat version 7.1 software.

3. Results and Discussion

Table 1. *Sociodemographic characteristics, knowledge and breastfeeding practices of mothers of children aged 0-6 months in three localities in southern Côte d'Ivoire.*

VARIABLES (n= 200 for each location)	PROPORTIONS		
	BINGERVILLE	ABOBO	YOPOUGON
Marital status			
in couple	90.10[a]	99.95[a]	78.16[a]
Level of education			
Enrolled	82.40[a]	100[a]	90.47[a]
Exclusive breastfeeding	53[a]	50[a]	51[a]
Difficulties in practicing exclusive breastfeeding			
Sick mom	14.78[a]	4.50[b]	3.52[b]
Fatigue	13.36[a]	6.77[b]	7.74[b]
Daily occupation	5.63[a]	3.95[a]	3.52[a]
Agalactia or hypogalactia	40.84[a]	54.23[a]	38.02[a]
Sick baby	3.50[a]	0.56[a]	nd
Stress	nd	nd	2.11[a]
Nipple pain and cracking	nd	nd	3.52[a]
Atrophy of the udder	nd	nd	1.40[a]
First breastfeeding			
1h-3d	53.40[a]	68.36[a]	54.22[a]
Association of plants			
Accumulation of plants (More than 1 plant)	80.30[a]	31.63[b]	34.50[b]
Period of improvement of milk production			
24 hours	50.30[a]	53.89[a]	50.70[a]

Values are means ± standard deviations of 200 trials (n=200). Values with the same letters in the same row are not significantly different at the 5% level according to the Newman-Keuls test. nd: not determined.

Most of the mothers surveyed in Abidjan localities such as Abobo, Bingerville and Yopougon were in a couple, with respective proportions of 99.5%, 90.10% and 78.16%. These different proportions obtained remain similar to those found by Traore (86%) [16]. These observations imply that the integrity of the family fabric is a prerequisite for the proper

development of child, and underscores crucial role that spouse's support (51.97%) could play in breastfeeding the child. Concerning the proportion of schooling for the three communes of Abobo, Bingerville and Yopougon, the respective rates are 100%, 82.4% and 90.47%, the schooling rate is generally over 50%. This proportion of Gamgne [10]. This predominance of women in most of the three localities surveyed can be explained by the high rate of schooling of young girls in the Abidjan localities [17]. Zengbe-Acray & Zengbe-Acray *et al*. had also mentioned this predominance of educated women (70.2%) [18].

In Côte d'Ivoire, the North, Center-West and North-West regions stand out for their increased prevalence of chronic child malnutrition.

They have literacy levels of 29.6%, 28.7% and 27.7% among women of childbearing age, respectively. These literacy rates are among the lowest compared to the South in the city of Abidjan [5]. According to the occupational analysis, women generally worked in the informal sector or as housewives. This could be explained by their under-qualification, which would be linked to their level of education [19].

The study also revealed that the respondents faced converging problems that included maternal illness, fatigue, daily occupation, and insufficient milk production in the breastfeeding mother. Insufficient milk production is noted with the highest proportion among all the difficulties listed in the three localities. They are respectively 38.02%, 40.84% and 54.23% for the localities of Yopougon, Bingerville and Abobo. The existence of insufficient breast milk production of the non-practice of exclusive breastfeeding reported during this survey is in line with the study on the analysis of the nutritional situation in Côte d'Ivoire [3].

This 2015 study reports that for some mothers, the reasons behind the early introduction of foods other than breast milk in the diet of children under 6 months are insufficient milk and the growth of the infant. According to the respondents, as the baby grows, "his stomach gets bigger. The difficulty related to insufficient milk production in the udders of lactating mothers is in line with the results of the work of Mouroufie *et al*. [20]. The insufficiency of milk production in the udders of lactating mothers would have been overcome by the use of food plants in general in the commune of Abobo, Bingerville and Yopougon.

Concerning the similar difficulties recorded in the localities mentioned, the difficulty such as fatigue is recorded second in the respective localities of Yopougon and Abobo with proportions of 7.74% and 6.77%. However, the difficulty that ranks second in Bingerville is that related to the nursing mother’s precarious health with a 14.78% rate, while fatigue in this same locality ranks third with a proportion of 14.78%. With regard to divergent difficulties, the difficulty concerning the nursing mother’s precarious health with a 14.78% rate is indicated with proportions of 0.56% and 3.5% respectively. While in Yopougon, the specific difficulties are nipple pain and cracks, stress and nipples atrophy. The recommended solution is good latching in the face of breast pain and cracking. In general, the first latching of the infant was done with a relatively high proportion in the three locations.

The use of food plants as an alternative is higher in Bingerville. This is because Bingerville is an easily accessible locality with respect to food plants consumed to improve breast milk production. However, on the whole, the periods of improvement of breast milk production are similar.

The sick mother parameter, the largest proportion is recorded with the locality of Bingerville (14.78%). The frequent diseases of the mother can be related to severe anemia, great fatigue, severe depression, untreated hypothyroidism, acute fever and malaria [3]. These indicated parameters may constitute an inhibition to milk supply which normally occurs with the following criteria. Sensation of heat in the breasts, more or less important swelling of the breasts, a moderate fever may appear. This rise in breast milk normally occurs between birth and 72 hours, but up to 15 days later, it is delayed. This is why it is important to start breastfeeding the baby within the first few hours after delivery.

For the natural rise, it is necessary to consume galactogenic food plants such as those recorded in the survey and apply hot water compresses on the breasts.

In addition to good practice of exclusive breastfeeding, its effectiveness must depend on significant lactation linked to good nipple sucking by the infant. The breasts produce two types of milk: the first is very watery, to quench thirst, followed by a thicker milk filled with nutrients. For your baby to get both kinds of milk, he or she must empty one breast before starting to suckle the other. Therefore, the following conditions must be met to keep the infant's weight in line with the reference weight curve.

Thus, it is necessary to increase infant-mother breastfeeding contact in order to increase the production of the attachment hormone, namely oxytocin, which is the hormone that ejects breast milk. Thus, with regard to sucking, it is necessary to make sure that the latch was made with an optimal opening of the mouth around the breast areola of the breastfeeding mother followed by the folding back of the upper and lower lips by noticing the absence of tongue and lip frenulum.

During sucking, the infant alternates sucking, swallowing and breathing. Thus, the sounds of swallowing and the relaxation of the arms are perceptible in the infant.

Efficient sucking is achieved through a good latch on position, which avoids pain on one side of the child's body.

Moreover, this position allows simultaneous rest of the infant and the nursing mother. Because fatigue, stress and insomnia could daily prevent effective lactation [21]. Also, the good grip of breasts would prevent the occurrence of cracks, breast engorgement and possible pain from a caesarean intervened during the delivery. All this is to provide solutions to the parameter of pain and nipple cracks recorded in the locality of Yopougon with a proportion of 3.52%. Also, the parameter of atrophy and nipple tip not very prominent is indicated with a value of 1.4%. There are also

breast tips that may be slightly protruding and the possible solutions are repeated sucking which will help to form protrusions at the nipple.

Also, the mother may experience problems with delayed milk supply after delivery. The normal milk flow is between the 3rd and 5th day after delivery. It can be delayed; therefore, the infant should not be put to the breast before 4 to 5 weeks. In addition, according to the information collected, the average age of cessation of breastfeeding is 15 months with a minimum of 5 months and a maximum of 24 months. The age at which breastfeeding stops varies from one mother to another, depending on the parents' wishes and/or occupations, especially the mothers.

In general, the mother decides to stop breastfeeding. According to the health workers, early cessation of breastfeeding would explain the occurrence of malnutrition in the child and breast engorgement or infections in the mother. For some respondents (mothers, fathers, grandmothers, health workers), "the abrupt cessation of breastfeeding leads to malnutrition in children, because mothers do not have the means to vary the child's diet. The average number of daily meals for the child after stopping breastfeeding is 4 meals with a minimum of 3 meals and a maximum of 5 meals. On the whole, the decision to stop breastfeeding is made by the mother. But often it is made, either by the couple, grandmothers or parents [3].

To avoid early cessation of breastfeeding with the introduction of mostly unbalanced meals with significant pathological consequences, sustainable solutions in the form of recommendations are needed. Indeed, a good latch passes through the oral cavity which covers the entire space occupied by the breast areola.

For schooling, it is necessary to encourage and promote the enrollment of girls in education related to literacy in order to provide them with an average level of education. Concerning the illness of the mother and the baby, women should be encouraged to frequent the health structures. Regarding fatigue, women must have simultaneous rest periods between themselves and their babies. The daily occupation implies that the government should promote and create income generating activities in order to allow women to financially face the needs of essential nutrients through the easy access to lactogenic food plants.

Building community hospitals, implementing nutrition planning and food security analysis, implementing humanitarian nutrition and food security projects, communicating strategic nutrition goals for infants and young children, addressing the recommendations for sustainable and effective solutions for improving mother-child health in low-income households, accelerating girls' school integration, promotion of children's rights in terms of nutrition and food security, direct consequence of maternal nutrition on survival, nutrition and consequently children's health, fight for children's rights in terms of nutrition, help the most vulnerable children so that they have access to food wherever they live in Côte d'Ivoire, support the implementation of generating activities in order to improve women's living conditions, prevention and treatment in terms of nutrition, ensure a better future for each child, promotion of measurable behavioral change. Successful and sustainable implementation of exclusive breastfeeding requires the involvement of education, health and community services.

4. Conclusion

Our results allowed us to identify the difficulties that compromise the implementation of exclusive breastfeeding of infants from 0 to 6 months in three localities of the District of Abidjan, namely the communes of Yopougon, Bingerville and Abobo, in the south of Cote d'Ivoire. Among these difficulties, there are those that have been found in the three localities with varying proportions. These include the mother's state of health, the daily occupation, the mother's fatigue, and the insufficient production of breast milk. Among the difficulties recorded, it appears that the one related to the insufficiency of milk production is indicated with the highest proportions in the three localities. To deal with the main difficulty listed, the women in our survey used mostly similar food plants, generally composed of cereals, legumes, leafy vegetables and wild food plants. Consideration of food plants could help boost milk production among lactating mothers and sustainably reduce the prevalence of infant malnutrition among infants and very premature babies. The use of nutritious and lactogenic food plants composed of cereals, especially unhulled cereals, in nursing mothers could significantly promote the production of quantitative and qualitative breast milk. This type of milk produced would solve the problem of the occurrence of micronutrient deficiencies, underweight reflecting chronic and acute malnutrition as well as stunted growth in the infant population. Our study aimed to contribute to the multisectoral orientation of the National Nutrition Policy in the fight against child malnutrition in Côte d'Ivoire through the constant availability of exclusive breastfeeding.

Conflict of Interest

The authors declare that they have no conflict of interest in relation to this article.

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