

Original Article

Duration and Sociodemographic Factors Associated with Exclusive Breastfeeding Among Mothers in Urban and Semi-Rural Areas of Libreville and Lambaréné in Gabon

Steeve Minto'o¹, Fifi Claire Loembe¹, Midili Thècle Larissa¹, Mireille Mensan Pemba¹, Koumba Maniaga Raïssa¹, Mylène Mimbila-Mayi¹, Yolande Nzame¹, Essomo Murielle¹, Eliane Kuissi-Kamgaing¹, Jean Koko¹, Simon Ategbo¹

¹Department of Pediatrics, Faculty of Medicine, Université des Sciences de la Santé, Libreville, Gabon.



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Corresponding author:
Steeve Minto'o
steeve.mintoo@yahoo.fr

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Abstract:

Background: Exclusive breastfeeding from birth to six months of age has an unparalleled benefit on a child's growth and development. This survey aimed to assess the practice of exclusive breastfeeding (EBF) in Libreville and Lambaréné.

Method: This is a prospective study, including mother-child pairs of infants taken to vaccination centers in Libreville (urban area) and Lambaréné (semi-rural area). The data collected included sociodemographic aspects of families, the children's characteristics, and the duration of EBF in months.

Result: We included 552 mother-child pairs, 58% of whom were recruited (n = 320) in Libreville. The average age of mothers was 26.5 ± 6.4 years, while fathers were 33.3 ± 7.8 years. The mean age of children was 4.2 ± 3.1 months. Male participants were accounted for 52.2% (n = 288), while females 47.8% (n = 264). The mean duration of exclusive breastfeeding in the whole was 0.9 months. Six-month EBF was generally performed at 9.2% (n = 51, 95% CI = 7.1%-11.9%). The factors influencing the EBF were father's level of education (all classes combined) (p = 0.025), marital status (p = 0.011), and residential area (OR = 3.40, p <0.001)

Conclusion: The duration of exclusive breastfeeding in the two studied is lower than the WHO recommendations. The associated factors found are areas of work to be explored to encourage this important practice for our infants.

Keywords: associated factors, children, exclusive breastfeeding, gabon, prevalence

Introduction

Exclusive breastfeeding (EBF) is defined as giving only breast milk to infants. When performed during the first 6 months of life, EBF is a crucial aspect of optimal breastfeeding practices to prevent infant morbidity and mortality. It is important to remember that EBF for six months reduces gastrointestinal infections in young children and helps the mother lose weight while preventing a new pregnancy. It also has long-term impacts on allergic diseases, growth, obesity, cognitive ability, and behaviour. By encouraging this practice, the World Health Organization (WHO) estimates that the lives of one million children under-five could be saved annually in developing countries. Despite its efficacy and cost-effectiveness, EBF during the first six months of an infant's life is insufficiently practiced in several parts of the world.¹ This is particularly evident in sub-Saharan African (SSA) countries, where a significant number of infants (55%) and under-five mortality (75%) are attributed to inadequate breastfeeding practices.²

In 2013, the WHO and the United Nations Children's Fund (UNICEF) set a global nutrition target of achieving an EBF prevalence rate of $\geq 70\%$ by 2030.³ The rate of EBF in SSA is estimated to be 35%, compared to 39% in other developing regions. Only 18 of the 49 African countries are on track to meet the World Health Organization's (WHO) 2025 global nutrition targets, aiming to increase this rate to 50%.⁴ However, UNICEF's efforts to raise awareness among young mothers about the real benefits of EBF on child development are observable. Exclusive breastfeeding rates worldwide increased from 36% in 2011 to 43% in 2014. Niger, for example, documented a surge in the exclusive breastfeeding rate from 4% in 2011 to nearly 23% in 2014, as did Sierra Leone, which rose from 11% to 32% over the same period.⁴

In the same period, Gabon's 2012 Demographic and Health Survey (DHS) noted an EBF rate of 6%, with an average EBF duration of 1.1 months.⁵ Therefore, our study aimed to investigate whether UNICEF's all-out advocacy yielded similar results in our country. The purpose of our study was to participate in improving EBF practices in our country by assessing the duration of EBF in Gabon and identifying the sociodemographic factors associated with its inadequacy.

Method

This prospective, longitudinal and analytical study was conducted in Libreville (urban) and Lambaréné (semi-rural) from Oct 1 2019 to Mar 31 2020. It involved infants aged 0 to 11 months and their mothers.

We included infants aged 0 to 11 months living in Libreville and Lambaréné and their mothers, both in apparent good health, seen during weighing or vaccination sessions in health centres in both localities. All the children included were recruited voluntarily from the families. They had to have a health record.

We did not include infants over 11 months of age, those whose parents had refused to participate in the study, or those who were only passing through the city. We also excluded mother-infant couples who were following a protocol for the prevention of mother-to-child transmission of HIV and those whose parents had decided to leave the study project.

The calculation of the sample size using Statcalc from Epi Info 7.2 gave a minimum number of subjects of 420, with an expected frequency of 70% (which corresponds to the WHO and UNICEF targets for 2030 in EBFs), a margin of error of 5%, with a 95% confidence interval; a mitigating factor of our study type of 1.3. Four hundred twenty subjects for 210 per cluster (Libreville and Lambaréné) were recruited. We then accepted a weighting adjustment, bringing the representation of Libreville cluster to nearly 60% and Lambaréné cluster to 40% to reflect the demographic distribution of Gabon.^{6,7}

The active phase consisted of collecting data concerning the children: date of birth, sex, rank of the child among the siblings, number of children in the house, and practice of EBF at the time of the interview. When EBF was underway, the mother entered a database of subjects to be contacted again one week after the interview and then every two weeks to find out when she had stopped the EBF. The variables collected for parents were age in years, education and occupation of the mother and father.

Quantitative variables were expressed as mean or median. Qualitative variables were expressed in terms of frequency. The frequency of EBF was expressed in 95% confidence interval. The univariate analysis assessed the association between a sociodemographic characteristic and EBF ≥ 6 months by calculating the odd ratio with a 95% confidence interval according to the Miettinen method. This analysis made extracting the variables of interest possible for the multivariate analysis performed in logistic regression. The p-value selected as significant was <0.05 for a two-tail Chi-square test.

In the absence of a National Ethics Committee during the investigation, the Gabon Ministry of Health approved the study before it started. Parents gave their written consent by signing the informed consent on the day of inclusion. Data confidentiality was fully respected.

Result

We included 552 mother-child couples, 320 (58%) in Libreville and 232 (42%) in Lambaréné. **Table 1** illustrated the characteristics of children and families.

Table 1. Characteristics of the families

	Total (n=552)		Libreville (n=320)		Lambaréné (n=232)	
Mothers' age (mean ± SD)	26.5 ± 6.4		27.2 ± 6.1		25.6 ± 6.8	
Fathers' age (mean ± SD)	33.4 ± 7.9		33.8 ± 7.8		32.8 ± 7.8	
Mother's educational level						
Primary	125	22.6%	63	19.7%	62	26.7%
Secondary	331	60.0%	170	53.1%	161	69.4%
University	96	17.4%	87	27.2%	9	3.9%
Father's educational level						
Primary	59	10.7%	18	5.6%	43	18.5%
Secondary	341	61.8%	173	54.1%	167	72.0%
University	152	27.5%	129	40.3%	22	9.5%
Household's monthly income						
< 250 USD	176	31.9%	59	18.4%	117	50.4%
USD 250-500	216	39.1%	137	42.8%	79	34.1%
USD 501-1000	137	24.8%	107	33.4%	30	12.9%
USD 1001-1500	16	2.9%	11	3.5%	5	2.2%
> 1500 USD	7	1.3%	6	1.9%	1	0.4%
Mother's occupational status						
Not Working	351	64%	179	55.9%	172	74.1%
Actively Working	133	24%	94	29.4%	39	16.8%
Student	68	12%	47	14.7%	21	9.1%

Children's characteristics

Males accounted for 52.2% (n = 288) and females 47.8% (n = 264). The mean age of the children was 4.2 ± 3.1 months. The median rank of siblings was 2.

Parents' age and education level.

Overall, the mother's mean age was 26.5±6.4 years, with mothers from Libreville averaging 27.2±6.1 years and mothers from Lambaréné averaging 25.6±6.8 years. The

majority of mothers had a secondary education (60.0%), followed by primary (22.6%) and university (17.4%). In Libreville, 53.1% of mothers also had a secondary educational level, while 19.7% had a primary education, and 27.2% went to university. Similarly, mothers from Lambaréné mainly had secondary education (69.4%), while 26.7% had a primary educational level and 3.9% had university education level.

The overall mean age for fathers was 33.4 ± 7.9 years, with the fathers from Libreville averaging 33.8 ± 7.8 years and those from Lambaréné averaging 32.8 ± 7.8 years. Fathers mainly had secondary education (61.8%), with 10.7% having primary education and 27.5% receiving a university education. Fathers from Libreville also primarily graduated from secondary education (54.1%), followed by primary education (5.6%) and university (40.3%). In Lambaréné, 72.0% of fathers had a secondary education, 18.5% had a primary education, and 9.5% went to university.

Characteristics of the households

Parents lived as a couple in 67.2% of cases ($n = 371$). Mothers had a median number of pregnancies of 3 with an interquartile range (IQR) of 2. In general, 31.9% of households earned less than 250 United States of America Dollars (USD) per month, 39.1% earned between 250 and 500 USD, 24.8% earned between 501-1000 USD, 2.9% earned between 1001-1500 USD, and 1.3% earned more than 1500 USD. In Libreville, 18.4% of households earned less than 250 USD per month, 42.8% earned between 250 and 500 USD, 33.4% earned between 501-1000 USD, 3.5% earned between 1001-1500 USD, and 1.9% earned more than 1500 USD. In Lambaréné, 50.4% of households earned less than 250 USD per month, 34.1% earned between 250 and 500 USD, 12.9% earned between 501-1000 USD, 2.2% earned between 1001-1500 USD, and 0.4% earned above 1500 USD.

Generally, the majority of mothers were not working (64%), while 24% were actively working and 12% were students. In Libreville, the percentages were the same: 64% not working, 24% actively working and 12% students. In Lambaréné, 74.1% of mothers were not working, 16.8% were active, and 9.1% were students.

Breastfeeding duration

The mean duration of exclusive breastfeeding in general was 0.9 ± 1.5 months. The frequency of six-month EBF was 9.2% ($n = 51$; 95% CI = 7.1 - 11.9). In Libreville, the six-month EBF frequency was 4.2% ($n = 14$; 95% CI = 2.6 - 7.2), while in Lambaréné, the frequency was 15.9% ($n = 37$; 95% CI = 11.5% - 21.3). The duration of exclusive breastfeeding differed significantly depending on the mother's level of education, the presence of father's occupation, marital status, and recruitment location (Table 2).

Table 2. Average Duration Exclusive of Breastfeeding

	Mean (SD)	n	p
Mothers' Educational Level^a			0.028
Primary	1.19 (1.90)	125	
Secondary	0.849 (1.48)	331	
University	0.646 (1.40)	96	
Father's Educational Level^a			0.094
Primary	1.24 (2.10)	59	
Secondary	0.909 (1.53)	341	
Upper	0.717 (1.43)	152	
Mother's Occupational Status^a			0.25
Not Working	0.883 (1.58)	351	
Actively Working	1.04 (1.72)	133	
Student	0.647 (1.26)	68	
Father's Occupational Status^b			<0.01
Not Working	0.846 (1.56)	460	
Actively Working	1.47 (1.87)	59	
Student	0.485 (0.755)	33	
Household's Monthly Income^b			0.15
USD 250-500	1.01 (1.71)	216	
< 250 USD	0.898 (1.53)	176	
USD 501 – 1000	0.715 (1.42)	137	
USD 1000 – 1500	1.12 (1.67)	16	
>1500 USD	0 (0)	7	
Sex^c			-0.69
Male	0.917 (1.60)	288	
Female	0.864 (1.56)	264	
Marital status^c			<0.01
Married	1.00 (1.69)	388	
Single	0.628 (1.23)	164	
Town^c			<0.01
Libreville	0.728 (1.49)	320	
Lambaréné	1.12 (1.67)	232	

^a was analyzed using ANOVA test. ^b was analyzed using Kruskal-Wallis. ^c was analyzed using Welch. SD: standard deviation, n: number of population, p: p-value, USD: United States Dollar

Multivariate analysis showed that the EBF was significantly different according to the father's level of education (all classes combined) ($p = 0.025$); the duration of the EBF was shorter for those in single marital status compared to couple ($OR = 0.371$, $p = 0.011$), and longer when families living in Lambaréné than in Libreville ($OR = 3.40$, $p < 0.001$) (**Figure 1**).

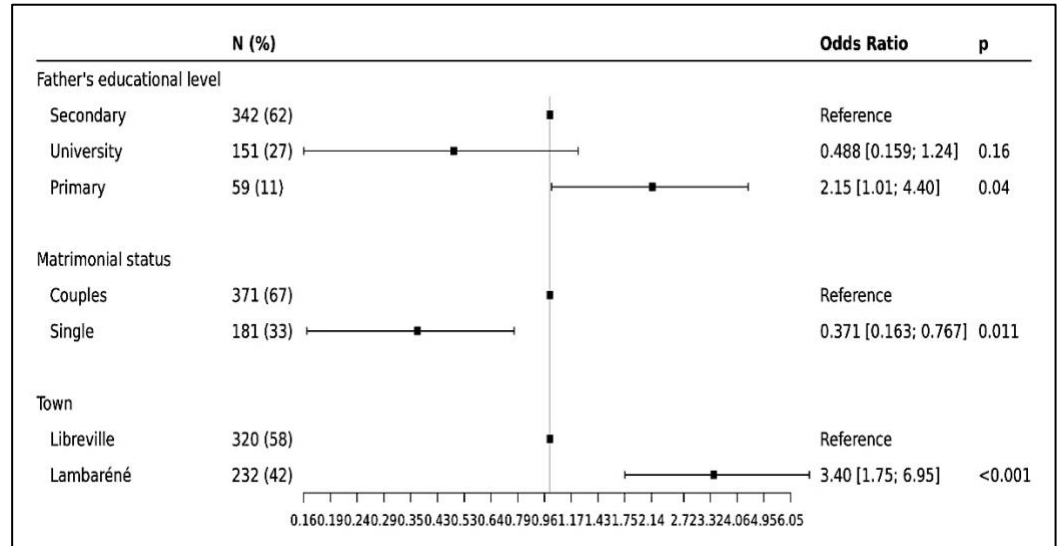


Figure 1. Forest plot of the logistic regression for factors impacting breastfeeding in Gabon

Discussion

The characteristics of the families can be superimposed on the results of Gabon's most recent demographic and health survey.⁶ The type of study and collection sites ensure that our results represent breastfeeding practices and, more specifically, EBF in these two localities.

The duration of EBF in our study was 0.9 months, almost the same as that published in 2012, which was 1.1 months, but lower than the duration of the 2023 DHS, which was 2.3 months.^{5,6} The difference between our result and the DHS is based on the sampling and study design chosen in both cases. The DHS 2023 selected 2/3 of interviewees from other provinces and 1/3 from Libreville and Port-Gentil. In comparison, Libreville and Port-Gentil represent 60% of the Gabonese population.

There is an over-representation of the country's interior, which has, therefore, clearly distorted the national average duration of EBF, as populations in the interior have a longer duration of breastfeeding. We respected this proportion in our survey. In addition, the DHS interviews were sometimes conducted long after the pregnancies,

while our study included mothers who are still actively engaged in childcare and immunization. Therefore, the subjects in our study were less prone to memory bias.

The frequency of EBF in our study was 9.2%. This frequency confirms the data that places Gabon in the category of countries with the lowest rates of EBFs globally, together with Chad at 2.2% but well below Rwanda at 87.7%.⁴ The latest data for Gabon reported a frequency of 19% throughout the country.⁶ Given the abovementioned biases, we also argue that this frequency is overestimated. This frequency found by the DHS III is close to and included in the confidence interval of the frequency we found in Lambaréné, a semi-rural town with 15.9%.

Our study suggests that the EBF in Gabon is stagnating. This view is reinforced by Bhattacharjee's study, which shows no change in the number of EBF and even breastfeeding in Gabon between 2000 and 2018, despite improvements in other public health markers supported by the WHO and UNICEF.⁶

In our study, women with a higher level of education had a shorter duration of EBF than those with a lower level of education. This finding is similar to Mathew AC et al. in Nepal and Nurokhmah et al. in Indonesia, who found that the median duration of EBF for mothers with a high level of education was lower than that for mothers with a lower level of education.^{7,8} Conversely, studies by Pariya et al. in Calcutta, Lopez de Aberasturi et al. in Spain, and Economou et al. in Cyprus noted that a high level of mother's education was associated with a longer EBF.⁹⁻¹¹

Women living with a partner have a longer breastfeeding duration than women living alone. This situation can be explained by a cultural fact in Gabon: the newly delivered woman ("moussonfi", lactating woman) who is married receives care from the women of her family and her in-laws so that she can devote herself only to the EBF and the care of her newborn. She is provided with everything she needs, including toiletries and meals; she is not allowed to go into a kitchen or do any household chores for two lunar months.^{12,13} In its traditional form, this period was longer, but it has been adapted to the residential settings; it tends to be longer in rural than urban areas. The "moussonfi" period is abbreviated in urban areas, as the mother must take her child to a health centre for weighing and vaccinations. This could present challenges such as public transportation, queues, and potential scrutiny from strangers if the mother were to breastfeed in public.¹³⁻¹⁵ Longer EBF durations were also found among women with partners at DHS 2023 and populations in Kolkata.^{6,9} Family guidance and support were also identified as factors contributing to the success of EBF in the Mpumalanga region of South Africa.¹⁶ This finding is not surprising compared to our survey results because the populations of Mpumalanga consist of Bantu people who share similar cultures to those in Gabon. Some factors regularly analysed in the

literature, such as the number of prenatal consultations and the existence of breastfeeding preparation sessions, could not be analysed in our study due to the absence of uniform pregnancy follow-up logs; some diaries had pregnancy follow-up pages mentioning these sessions, while others did not, or the parents did not have them during the interviews.

The lower father's educational attainment was associated with a longer duration of EBF. This factor may be related to the lack of employment, but it may also be influenced by a more traditionalist aspect of people with low levels of education.^{6,13} The factor with the strongest association with a good duration of breastfeeding was living in the country's interior (Lambaréné). Living in the interland brings together all the cultural and societal ingredients that favour a longer practice of EBF as the cultural practice of "moussonfi" is more accessible in this area. Other surveys in India, Indonesia, and South Africa highlighted living in an urban area as a factor favouring EBF.^{8,9,16,17} On closer reading of these results, the existence of medical structures encouraging mothers to breastfeed before and after birth also make a difference, as there were more "baby-friendly" structures in these cities.

Conclusion

The results of our study are a reminder that while mother's milk is free food, EBF has a cost. Women in cities work more outside the home and breastfeed less than women in rural areas. This fact is undoubtedly linked to the professional obligations they must fulfil to not remain on the sidelines of the labour market. Indigenous cultural practices that foster EBF are diluted in the urban world and more robust in the rural world. State structures have compensated for these cultural losses by strengthening labour legislation to protect working women's EBFs. Gabon is, therefore, far from the targets set for 2030. The trend would be reversible if he could rely on his cultural achievements and the increase in the number of mother preparation sessions for the EBF.

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Conflict of Interest

None declared

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