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Factors associated with the duration of breastfeeding in quilombola women

Fatores associados à duração do aleitamento materno em mulheres quilombolas

Abstract

Objective: To evaluate the median duration of total and exclusive breastfeeding in quilombola children and identify which factors interfere in the duration of total breastfeeding. **Methods:** This is a cross-sectional study conducted with 207 children younger than 24 months of 27 quilombola communities on a state of northeastern Brazil. The median duration of total and exclusive breastfeeding were calculated in days with Kaplan-Meier estimator and the associated factors obtained through Cox regression. **Results:** The median duration of total and exclusive breastfeeding was 270 and 60 days, respectively. Maternal age ≥ 30 years [Hazard Ratio (HR): 0.66; 95% Confidence Interval (95% CI): 0.45 - 0.97] was shown to be protective for the continuity of breastfeeding, while the community not certificated (HR: 1.40; 95%CI: 1.03 - 1.89) and juice consumption before six months of life (HR: 1.75; 95% CI: 1.25 - 2.55) were risk factors. **Conclusion:** The duration of exclusive and total breastfeeding, although high, was below the recommended. The highest maternal age and juice consumption before the age of six months were the only associated factors, evidencing that breastfeeding is susceptible to environmental and physiological conditions

Keywords: Breast feeding. Infant. African Continental Ancestry Group

Resumo

Objetivo: Avaliar a duração mediana do aleitamento materno total e exclusivo em crianças quilombolas e identificar quais fatores interferem na duração do aleitamento materno total **Métodos:** Estudo transversal realizado com 207 crianças com até 24 meses de 27 comunidades quilombolas em um estado no Nordeste do Brasil. A duração mediana do aleitamento materno total e exclusivo foi calculada em dias, com o estimador de Kaplan-Meier, e os fatores associados, obtidos pela regressão de Cox. **Resultados:** A duração mediana do aleitamento materno total e exclusivo foi de 270 e 60 dias, respectivamente. Idade materna ≥ 30 anos [Taxa de Risco (TR): 0,66; Intervalo de confiança de 95% (IC95%): 0,45 - 0,97] demonstrou ser protetora para a continuidade da amamentação, enquanto a comunidade não certificada (TR: 1,40; IC95%: 1,03 - 1,89) e consumo de suco antes dos seis meses de vida (TR: 1,75; IC 95%: 1,25 - 2,55) foram fatores de risco. **Conclusão:** A duração do aleitamento materno exclusivo e total, embora elevada, ficou abaixo do recomendado. A idade mais avançada, comunidade não certificada e o consumo de suco antes dos seis meses de idade foram os únicos fatores associados, evidenciando que a amamentação é suscetível a condições ambientais e fisiológicas.

Palavras-chave: Aleitamento materno. Lactente. Grupo com Ancestrais do Continente Africano.

INTRODUCTION

Breastfeeding (BF) is the single strategy that has the greatest impact on reducing infant mortality. According to the World Health Organization (WHO)¹ and the United Nations Children's Fund (UNICEF),² the increase in exclusive breastfeeding (EBF) rates has been responsible for preventing the deaths of approximately six million children every year all over the world. A study conducted in 42 countries showed that if 90% of children were in EBF by 6 months old and if the duration of BF continued after the introduction of healthy complementary food, 13% of deaths in children under 5 years old could be avoided.³

Despite this evidence and the efforts of international bodies and scientific research that prove the superiority of the EBF over other forms of feeding of children under six months old and of the supplementary BF up to two years old, about 85% of all mothers do not follow these recommendations and only 35% of children under four months are exclusively breastfed.⁴ These unsatisfactory indices become even more worrying considering that actions to promote, protect and support the BF are effective and low-cost strategies against child morbidity and mortality.^{5,6}

In Brazil, results found in a systematic review⁷ showed a tendency to increase the practice of BF during the years 1998 to 2013 and the prevalence of BF in children under one year old found in the 1990s was less than 60%. By 2013 was an increase in BF practice of 31.8% and the prevalence of exclusive and total breastfeeding were 36.6% and 52.1%, respectively.⁸

This growth can be attributed to the coordinated efforts that have been developed in the last decades in Brazil aiming the promotion and support to BF, such as the Baby Friendly Hospital Initiative (BFHI), the Kangaroo Method, the creation of the Brazilian Human Milk Bank (HMB), the national campaign of the World Breastfeeding Week, the Breastfeeding and Feeding Brazil Strategy (BFBS), among others that seek the legal protection in defense of the right to breastfeeding, such as maternity leave, day care centers, and the Brazilian Standards for the Marketing of Infant Food, Nipples, Pacifiers and Bottles. However, the current scenario is still far from the goals proposed by WHO.⁹⁻¹²

Some factors have been reported as being associated to the practice of BF, among them, maternal variables, such as age, schooling, occupation, parity, type of delivery, number of prenatal consultations, income and maternity leave; as well as infant-related variables such as pacifier use, birth weight, birth in institutions that participated in the BFHI, bottle-feeding, introduction of other milk and tea, breastfeeding in the first 24 hours of life and sex. For EBF,

the variables most frequently associated are: place of residence, maternal age and schooling, maternal work, child's age, use of pacifiers and financing of Basic Health Care.¹³

It is therefore perceived that some of these factors are related to the country's social inequalities. In Brazil, the group of descendants of African people, known as remnants of quilombos or quilombola, for many years remained on the margins of public policies, without any assistance from the State.

Quilombolas are a population group made up of black descendants who fled the slave regime. The remaining communities of quilombos are the physical spaces occupied by these people with a presumption of black ancestry and self-declared with historical and social roots.^{14,15} Thus, studies that evaluate the conditions of life and health in these territories are of great importance to provide subsidies for the implementation of public policies aimed at reducing social inequalities.¹⁶ Given the unequal situation that quilombola people live with, the encouragement of breastfeeding is a low-cost way that promotes a closer bond between mother and child that can significantly reduce exposure to infectious diseases and has a protective effect on child death.¹⁶

It is known that Maranhão is the State of Brazil with the second lowest Human Development Index (HDI)¹⁷ and specific studies that evaluate the health, nutrition and BF conditions in quilombola communities are scarce. Due to the precarious socioeconomic and demographic conditions that quilombola people live in early life and the direct impact that good nutrition and affective bond have on the long term of these children, this study aimed to investigate the median duration of breastfeeding in children under 24 months and the associated factors that interfere with these regimens.

METHODS

Design and Sample

This is a cross-sectional study with data coming from the research "Conditions of Nutrition and Food Safety of Women and Children of Quilombola Communities in Maranhão". Data were collected in August 2015 at the municipalities of Penalva and Viana, lowland region in Maranhão state, northeastern Brazil. The municipalities were selected for convenience because communities' local leaders were receptive to the study. The sample was non-probabilistic, and all families with children under five years old were evaluated in 27 quilombola communities in those municipalities. The interviews were conducted at the child's home, using a semi-structured and adapted form¹⁸ applied with the child's mother.

A total of 373 mothers were interviewed, however, in this study, data from BF referring to children up to 24 months old ($n = 221$) were used to avoid mother memory bias. Children whose mothers were adoptive ($n = 9$) and those who never breastfed ($n = 5$) were excluded, making up a final sample of 207 children.

Measurement and Median duration of TBF and EBF

The study outcomes were the median duration in days of total breastfeeding (TBF) and exclusive breastfeeding (EBF). The WHO defines TBF as the consumption of breast milk by the child concomitantly with artificial milk and other fluids. The EBF is the consumption of mother's milk without the introduction of any food or drink, except for medicines.¹⁹

The median duration of TBF and EBF were obtained from questioning the date of interruption of breastfeeding and the time of introduction of complementary foods, respectively. The total duration from the first day of life to discontinuation for TBF and from the first day of life to the time of introduction of any food or liquid before six months was considered.

Data collection

In order to obtain measures of weight and height of the mother, we used an electronic scale balance Omron® (model HBF214) and Altuxata® vertical anthropometer. All measurements were standardized according to techniques proposed by the WHO.²⁰ The measurements were performed in duplicate, and the mean value of the two was calculated. The two measurements were repeated when the measures of weight differed by more than 100 grams (g) and those of height by more than 1 centimeter (cm).

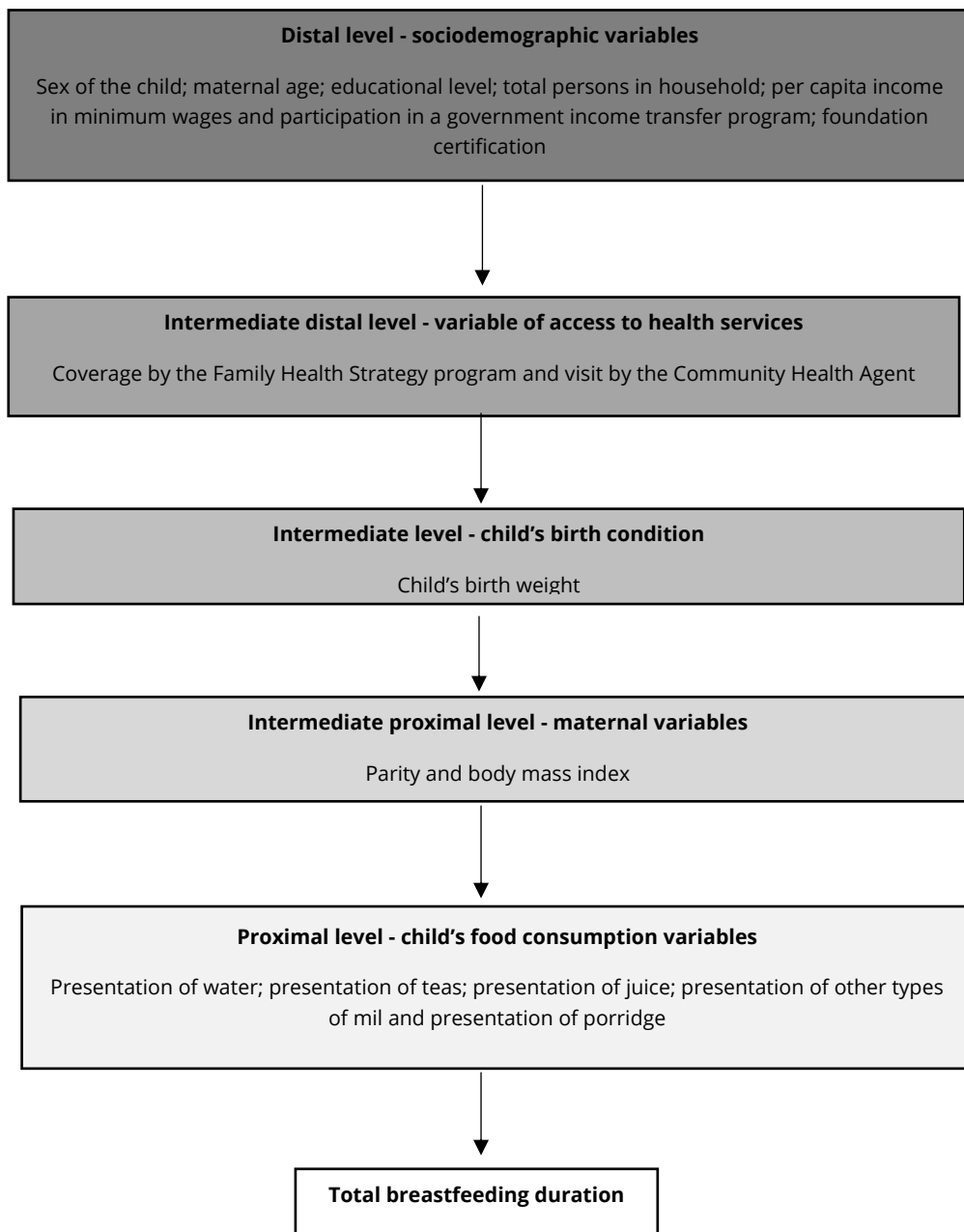
Data were collected by previously trained and standardized researchers from the Nutrition course of the Universidade Federal do Maranhão. Two field teams were formed consisting of two interviewers, one anthropometrist and two in charge of collecting the child's biochemical data. Data collection took place from 3 to 18 August 2015. All the participants signed the Free and Informed Consent Form according to the recommendation of Resolution No. 466/2012. The research was approved by the Research Ethics Committee of the Universidade Federal do Maranhão (UFMA) under protocol N°. 1.627.919 and CAAE N° 55457415.8.0000.5087.

Data analysis

For statistical analysis, only TBF was used, due to the low frequency of children in EBF. Thus, the independent variables were grouped into five levels, according to the hierarchical model for the discontinuation of TBF. In this model, the variables were organized according to their proximity to the outcome (Figure 1), namely:

1. Sociodemographic variables (distal level): sex of the child (male and female); maternal age (≤ 19 years, 20-29 years and ≥ 30 years); maternal educational level (<4 years of study and ≥ 4 years of study); total persons in the household (≤ 5 persons and > 5 persons); per capita income in minimum wages ($< \frac{1}{4}$ of minimum wage and $\geq \frac{1}{4}$ of minimum wage, according to the minimum wage in force in 2015: R\$ 788.00 or US\$ 202.95); participation in a government income transfer program (yes and no) and foundation certification to the community (yes and no, according to Palmares foundation certification until 2015²¹).
2. Variables of access to health services (intermediate distal level): coverage by the Family Health Strategy program (yes and no) and Visit by the Community Health Agent (yes and no).
3. Child's birth conditions (intermediate level): child's birth weight (<2500 g and ≥ 2500 g, according to UNICEF classification²²).
4. Maternal variables (intermediate proximal level): Parity (≤ 3 children and > 3 children) and Body mass index (WHO, 1995) (<18.5 kilograms(kg)/meter(m)², 18.5 - 24.9 kg/m² and ≥ 25.0 kg/m²).
5. Child's food consumption variables (proximal level): presentation of water (<6 months and ≥ 6 months); presentation of teas (<6 months and ≥ 6 months); presentation of juice (<6 months and ≥ 6 months); presentation of other types of milk (<6 months and ≥ 6 months) and presentation of porridge (<6 months and ≥ 6 months).

Figure 1. Hierarchical Model for the Discontinuation of Total Breastfeeding in quilombolas children from Maranhão, Northeastern Brazil, 2015.



The collected data were inserted in double entry in the program Epi info® (version 7.0). They were then transferred to the STATA software (version 14.0) for statistical analysis. The

median duration of TBF was estimated using Kaplan-Meier survival analysis. To assess the existence of associations, a Cox regression was used and Hazard Ratios (HR) and 95% confidence intervals (95% CI) between the outcome and the independent variables were generated.

The independent variables were inserted according to their hierarchical level. All variables adjusted to each other at each level, and those that presented statistical associations at the 10% level maintained for the next model. Statistical significance was set at 5% in the final model.

RESULTS

The socioeconomic, demographic and access to health services data of the mother and child of the quilombola communities are described in Table 1.

Of the total communities visited, only ten were officially certified by the Palmares Foundation, representing 40.1% of the interviewed families (Table 1). The number of women of childbearing age accompanied by at least one child under the age of five per community was an average of 15.1 (± 7.5) (data not shown in table).

Table 1. Socioeconomic, Demographic and Access to Health Services data of Quilombola Families from Maranhão, Northeastern Brazil, 2015.

Variables	N (%)
<i>Child's gender</i>	
Male	108 (52.2)
Female	99 (47.8)
<i>Maternal age</i>	
≤ 19 years	42 (20.3)
20 – 29 years	126 (60.9)
≥ 30 years	39 (18.8)
<i>Maternal education level</i>	
< 4 years	15 (7.2)
≥ 4 years	192 (92.8)
<i>Number of people in the household</i>	
≤ 5 persons	138 (66.7)
> 5 persons	69 (33.3)
<i>Family income per capita in MW</i>	
< ¼ de MW	165 (79.7)
≥ ¼ de MW	42 (20.3)
<i>Participation in a government income transfer program</i>	
Yes	160 (77.3)

Table 1. Socioeconomic, Demographic and Access to Health Services data of Quilombola Families from Maranhão, Northeastern Brazil, 2015. (Continues)

Variables	N (%)
No	47 (22.7)
<i>Foundation certification to the community</i>	
Yes	83 (40.1)
No	124 (59.9)
<i>Gender of the householder</i>	
Male	99 (47.8)
Female	108 (52.2)
<i>Coverage by the FHS program ^a</i>	
Yes	31 (15.1)
No	174 (84.9)
<i>Visit by the CHA</i>	
Yes	185 (89.4)
No	22 (10.6)
<i>Child's birth weight ^b</i>	
< 2500 gr	19 (11.2)
≥ 2500 g	151 (88.8)
<i>Parity</i>	
≤ 3 children	158 (76.3)
> 3 children	49 (23.7)
<i>Maternal BMI ^c</i>	
Low weight	16 (8.4)
Normal weight	117 (61.6)
Overweight	57 (30.0)
<i>Presentation of water to the child</i>	
Before six months of life	175 (84.5)
From six months of life	32 (15.6)
<i>Presentation of tea to the child</i>	
Before six months of life	184 (88.9)
From six months of life	23 (11.1)
<i>Presentation of juice to the child</i>	
Before six months of life	143 (69.1)
From six months of life	64 (30.9)
<i>Presentation of other types of milk to the child</i>	
Before six months of life	144 (69.6)
From six months of life	63 (30.4)
<i>Presentation of porridge to the child</i>	
Before six months of life	142 (68.6)
From six months of life	65 (31.4)

Abbreviations: MW, minimum wages; FHS, Family Health Strategy; CHA, Community Health Agent; BMI, body mass index

^a two families didn't know about Family Health Strategy program coverage;

^b 37 children had no information on birth weight;

^c 17 mothers had not their BMI calculated due to pregnancy

The median duration of TBF and EBF was 270 (95% CI = 252.6 - 301.5) and 60 days (95% CI = 32.2-102.7). The TBF and EBF survival curve shows that on the first day of life all the children

had been breastfed, while at the end of the third month of life, 12.8% of the children had already weaned and 48.7% had already introduced some food or liquid into the diet (Figure 2).

At six months of life, only 16.7% of the children were in EBF and at 24 months, 87.2% of the children had already weaned, with only 27 children remaining in the total breastfeeding sample (Figure 2).

Figure 2. Kaplan-Meier Estimator Curve for Total Breast Feeding and Exclusive Breast Feeding, 2015.

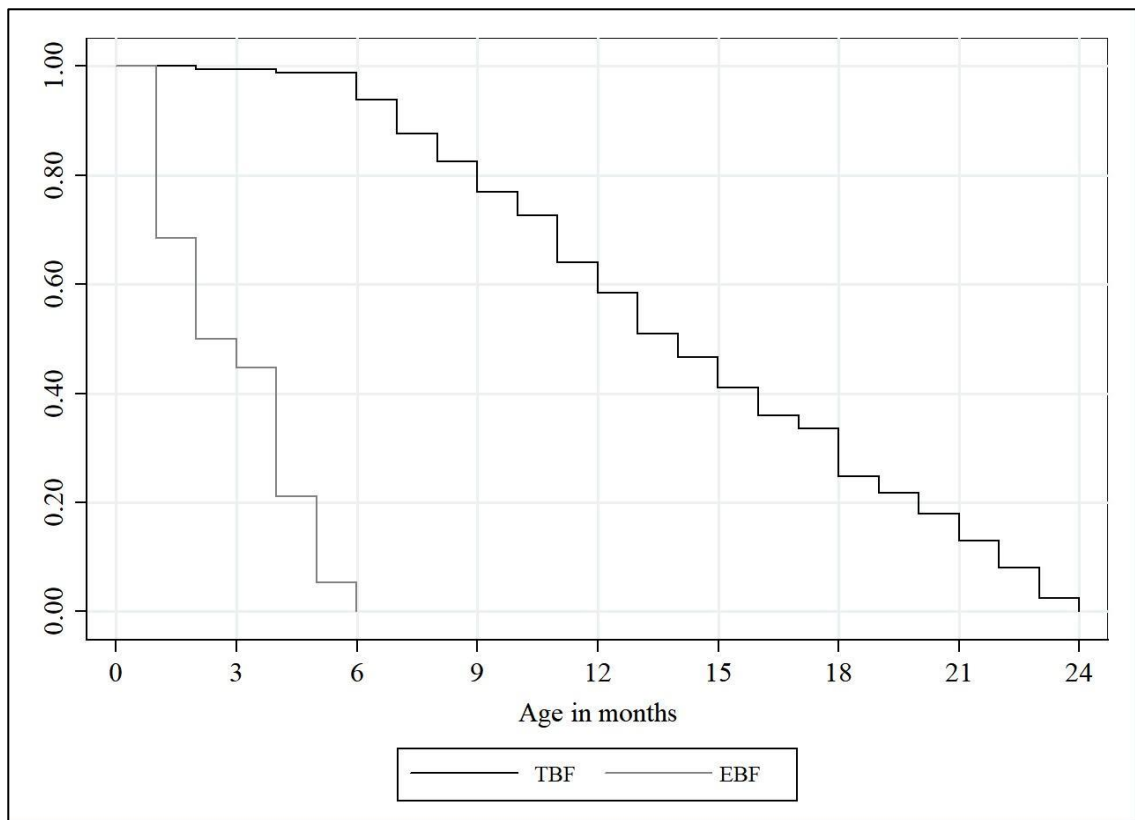


Table 2 shows the crude and adjusted hazard ratios of each independent variable associated with discontinuation of TBF in children up to 24 months old. According to the hierarchical model, the variables maternal age ≥ 30 years (HR = 0.66, 95%CI = 0.45 - 0.97), community not certificated (HR = 1.40; 95%CI = 1.03 - 1.89) and juice presentation to the child before six months of life (HR = 1.75; 95%CI = 1.20 - 2.55) remained statistically associated after adjustments with the other variables in the final model

Table 2. Risk of Discontinuation of Total Breastfeeding in Quilombola Children Under 24 Months of Age in Two Maranhense Municipalities, Northeastern Brazil, 2015.

Variables	Model 1 ^a HR (95%CI)	Model 2 ^a HR (95%CI)	Model 3 ^a HR (95%CI)	Model 4 ^a HR (95%CI)	Model 5 ^{a,b} HR (95%CI)
Child sex is male	0.90 (0.68-1.20)	-	-	-	-
Maternal age ≤ 19 years	0.95 (0.64-1.39)	-	-	-	-
Maternal age > 30 years	0.67 (0.46-0.98)	0.67 (0.46-0.99)	0.70 (0.46-1.07)	0.67 (0.46-0.99)	0.68 (0.47-0.98)
Mother with less than 4 years of study	1.30 (0.75-2.25)	-	-	-	-
> 5 persons in household	0.96 (0.70-1.32)	-	-	-	-
<i>Per capita</i> income < ¼ MW	0.98 (0.68-1.40)	-	-	-	-
Family doesn't participate of government income transfer program	1.08 (0.74-1.57)	-	-	-	-
Community not certificated	1.34 (1.00-1.81)	1.34 (1.00-1.80)	1.45 (1.05-2.01)	1.40 (1.04-1.89)	1.40 (1.03-1.89)
Family not covered by FHS	-	0.89 (0.59-1.34)	-	-	-
Family not visited by CHA	-	1.21 (0.77-1.90)	-	-	-
Child's birthweight < 2500 g	-	-	0.96 (0.59-1.56)	-	-
Mother with more than 3 children	-	-	-	0.97 (0.70-1.34)	-
Mother with low weight	-	-	-	0.80 (0.49-1.32)	-
Mother with overweight	-	-	-	1.12 (0.81-1.57)	-
Presentation of water to the child before 6 months	-	-	-	-	0.89 (0.59-1.34)
Presentation of tea to the child before 6 months	-	-	-	-	0.70 (0.51-1.11)
Presentation of juice to the child before 6 months	-	-	-	-	1.68 (1.12-2.03)
Presentation of other types of milk to the child before 6 months	-	-	-	-	0.93 (0.64-1.35)
Presentation of porridge to the child before 6 months	-	-	-	-	1.41 (0.98-2.04)

Abbreviations: MW, minimum wage; FHS, Family Health Strategy; CHA, Community Health Agent.

^a For layout optimization, it is understood here: model 1 (distal level); model 2 (intermediate distal); model 3 (intermediate); model 4 (intermediate proximal) and model 5 (proximal).

^b Model 5 (proximal level) is also the final model.

DISCUSSION

In the present study, TBF and EBF median were below the WHO recommendation. Maternal age equals to or greater than 30 years was protective against discontinuation of AMT, while the community not certificated and presentation of juice to the child before six months old were risk factors for this outcome.

The duration of TBF in quilombola children (270 days) was higher than that found in urban and rural areas of a Chinese province (180 and 240 days, respectively),^{23,24} in the most recent national survey in Mexico (201 days),²⁵ of the reported in France (105 days)²⁶ and Austria (208 days).²⁷ Only one study conducted in the rural area of ten Chinese provinces obtained a median higher than that found here (360 days).²⁸

In the national context, we observed medians of TBF similar to those found in this study. In cities at the northeastern Brazil, such as São João do Tigre, state of Pernambuco, and Gameleira, state of Paraíba, medians of 179 and 169 days were recorded, respectively.²⁹ The state of Bahia (northeastern Brazil) recorded the highest medians surveyed, with 376 days in a study conducted in Feira de Santana³⁰ and 423.6 days in another one developed in two municipalities of the Recôncavo Baiano.³¹ The urban area of the largest Brazilian city, São Paulo, recorded a median of 174.2 days.³²

The duration of EBF in quilombola children (60 days) did not follow the TBF pattern, being superior to only one of the studies consulted (24 days).²⁶ Other studies of the national scenario^{30,32,33} and international^{23,34} presented median durations of exclusive breastfeeding superior to that found in this study. This is probably due to the overcoming of limiting factors related to the sociodemographic conditions surpassed by these groups that persist in the quilombola communities of Maranhão.

In Brazilian studies regarding TBF duration, it seems that the geographic location of the families is an important factor. Studies performed in rural areas²⁹⁻³¹ had medians with closer values and even higher values than the one described in the present study. This can be explained by the lower access to certain foodstuffs that can contribute directly to the early weaning of the children and by the greater possibility that the mothers in these rural areas do not engage in remunerated professional activities outside the domestic environment.

The sociodemographic differences to which quilombolas are exposed may be a factor explaining the higher median duration of TBF than most studies consulted in both national and international scenarios. This is probably because breastfeeding is a low-cost form of food, making it accessible to the purchasing power of this population.

It is noteworthy that EBF did not follow the same pattern of the total, and this probably occurred due to the belief in the popular imagination that breast milk is not capable of feeding the child alone and also of the low education of the evaluated mothers. Even for traditional communities, the results observed in this study are similar to those observed in the general population without black ancestry living in the rural environment,²⁸⁻³¹ reinforcing the ability of the environment to determine how breastfeeding behaves.

In this study, it was observed that women aged 30 years and older presented a 34% lower risk of discontinuation of TBF. The scientific literature reports an association contrary to that found in the present study in non-quilombola populations.^{30,32,35} The longer time of BF by adult women can be attributed to greater experience and knowledge about breastfeeding, especially if this woman already has other children.

Another factor associated was the certification by the Palmares foundation. Women from communities which hadn't Palmares Foundation certification had 40% times more chances of early discontinuation of TBF. This can be explained due to the provision of a series of actions and policies for the quilombola population that stems from this policy.^{36,37} Not being covered by this quilombola identity protection policy meant less access to food and services, as most quilombola meals come from family production and also reinforced the social invisibility of this population segment¹⁶. In addition, recognition of being a quilombola ensures the provision of health services specifically targeted at this vulnerable population, as well as health education, which interferes directly in breastfeeding duration.^{36,37}

Another factor associated with discontinuation of TBF in the evaluated children was the introduction of juice into the diet. Children who had juice before six months of life had a 74% higher chance of weaning early. The early presentation (before six months of life) of foods or liquids to the child is already recognized in the scientific literature as one of the factors associated with early weaning.^{24,27,31}

The foods and beverages commonly offered to children have higher concentration of refined sugar. The consumption of these foods may tilt the child's taste to sweet taste, making them prone to prefer them over mother's milk. This fact is worrisome, since it indicates the inclusion of added sugars early in the feeding of these children, a practice discouraged by the American Heart Association³⁸ and by the WHO.³⁹

In addition, the association of juice with discontinuation of breastfeeding can be explained by the region's climate. Other types of milk and porridges are usually offered in hot preparations, while juices are usually presented icy. Due to its proximity to the Ecuador line, temperatures in

Penalva and Viana are usually above 30° Celsius, which makes the environment favorable to the greater consumption of juice, making the child's taste buds tilted to sweet taste.

Furthermore, although the children are all located in the rural area, the products usually advertised by children's advertising - other types of milk, cow's milk mixed with flour and sugar (porridge) and juices - were inserted before child's six months life, demonstrating the ubiquity of these products. While beverages such as water and teas, widely available to children under six months old, may be related to the lower level of schooling of mothers, the connection with quilombola culture and its relation to the curative power of teas.

The results presented here should be considered in the light of the problems still experienced by this remaining communities of quilombos. Authors^{37,40-43} emphasize that permanent access to basic rights such as health are not guaranteed by the public power equitably. Majority groups are privileged over specific segments such as quilombolas. This is confirmed by studies that reinforce that the black, brown and indigenous population has the worst indicators of mortality and inequality in access to health services.⁴³

Because it is a specific population segment, with lack in health assistance, low income and located at the rural areas of both municipalities investigated, this inequality by the public power can influence the nutritional conditions of children and women.

Among the limitations of this study is the lack of investigation of some variables historically related to breastfeeding, such as prenatal consultations, prematurity, type of delivery and the presence of women's partners. Moreover, the non-investigation of anthropological characteristics of quilombolas also does not allow a discussion to the satisfaction of the relationship of being quilombola and health and nutrition events. In addition, the fact that the sample is non-probabilistic may limit the extension of these results to other quilombola populations with similar characteristics to those reported in these communities evaluated here.

The main strengths of this study are the composition of the sample comprised only of children under 24 months old to reduce the memory bias of mothers on breastfeeding and the pioneering in the search for factors associated with breastfeeding in quilombola communities in the state of Maranhão, northeastern Brazil.

CONCLUSIONS

The median duration of the TBF of the quilombola children was high when compared to the findings of national and international studies; however, like the EBF median, it was below

WHO recommendation. Maternal age greater than or equal to 30 years protected against interruption of AMT and the community not be certificated and the presentation of juice before the six months of life of the child were risks for this outcome. This information may support intervention strategies and strengthen breastfeeding practices in communities as specific as quilombolas, especially in relation to the strengthening of actions related to Primary Care, whose coverage did not reach 15% of the evaluated mothers and children.

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Contributors

Silveira VNC worked at all stages from study design to revision of the final version of the article to be published; Silva GPC participated in the study design, data collection, data interpretation and manuscript writing; Padilha LL worked on the study design, analysis and interpretation of data, as well as the final revision of the article; Frota MTBA participated in all stages from study design to review of the final version of the article.

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