



Prevalence of exclusive breastfeeding and associated factors in a city in southern Santa Catarina, Brazil

Prevalência de aleitamento materno exclusivo e fatores associados em um município do extremo Sul Catarinense

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ABSTRACT

To identify the prevalence of exclusive breastfeeding and its related factors during the first six months of infant's life. This is a cross-sectional study with 102 nursing mothers in the city of Balneário Gaivota – SC, who underwent prenatal care in the public or private networks and gave birth in 2018. Data were collected using a questionnaire and included sociodemographic, gestational, and post-gestational variables. The prevalence of exclusive breastfeeding was 43.1%. Infants who used baby bottles were 45% less likely to have been exclusively breastfed up to six months of age, while those who were prescribed infant formula at hospital discharge were 54% less likely to do so. Factors related to exclusive breastfeeding are behavioral and modifiable; thus, health professionals must advise mothers during prenatal, childcare, and child-development consultations.

Keywords: Breastfeeding. Weaning. Lactation. Infant nutrition.

RESUMO

Identificar a prevalência de aleitamento materno exclusivo e fatores relacionados durante os seis primeiros meses de vida do lactente. Trata-se de um estudo transversal realizado com 102 nutrizes residentes no município de Balneário Gaivota – SC que efetivaram o pré-natal na rede pública ou privada e tiveram parto no ano de 2018. Os dados foram coletados por aplicação de questionário contemplando as variáveis sociodemográficas, gestacionais e pós-gestacionais. A prevalência de aleitamento materno exclusivo foi de 43,1%. Aqueles bebês que usavam mamadeira tiveram 45% menos probabilidade de ter recebido aleitamento materno exclusivo até os 6 meses de idade, e aqueles que receberam prescrição de fórmula infantil na alta hospitalar apresentaram 54% menos chance comparados aos seus pares. Os fatores relacionados ao aleitamento materno exclusivo são comportamentais e modificáveis, sendo necessária a orientação pelos profissionais de saúde durante a consulta pré-natal, puericultura e no acompanhamento do desenvolvimento infantil.

Palavras-chave: Aleitamento materno. Desmame. Lactação. Nutrição do lactente.

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INTRODUCTION

Breastfeeding is a natural strategy to establish bonds, affection, and feed infants, in addition to being the most sensible, economic, and efficient intervention to reduce child morbidity and mortality. It is much more than feeding, it is a profound interaction between mother and child¹. During breastfeeding, the newborn needs more than mother milk; they need their progenitors, love, a touch of the hand that feeds them, establishing an even deeper bond between mother and child².

The World Health Organization (WHO) recommends exclusive breastfeeding, whether directly from the breast or milked, including no solids or any form of complementary foods up to the sixth month of life.³ According with different authors, no other strategy has the impact provided by breastfeeding, since breast milk has all necessary nutrients for the infant, in addition to protective factors against diseases (such as overweight and obesity), and improves the cognitive performance of the newborn^{4,5}.

Brazil is an international reference in regard to breastfeeding, an example for other countries when it comes to actions to encourage the practice^{6,7}. According with the most recent research carried out in the country, the National Study on Feeding and Nutrition (ENANI), in the last 30 years there was an increase in the prevalence of breastfeeding, which, in turn, reduced hospitalizations due to diarrheal diseases and respiratory infections, improving national child health indicators⁸.

Although the country has a reasonable adherence to breastfeeding, it is necessary to keep maintain all actions to encourage breastfeeding. Furthermore, it is important to highlight that health workers have an important role in regard to encouraging this practice, especially in situations of negligence, since it influences

child morbidity and mortality³. In addition, there are several difficulties to effectively implement breastfeeding, including cultural, clinical issues, and, especially, difficulties related with problems of the breast⁹. Therefore, this work is justified as a tool to keep the prevalence of breastfeeding from decreasing, and to increase this same prevalence.

Therefore, this study aimed to identify the prevalence of exclusive breastfeeding and its related factors during the six first months of life of the infant in the south of Santa Catarina (SC), a state in the south of Brazil.

MATERIALS AND METHODS

This is a cross-sectional, quantitative, descriptive and analytical study carried out in Balneário Gaivota, a coastal city in the south of Santa Catarina, a Brazilian state. The city has an 147.5 km², and its population, according with the last census, is of 8,234 people, leading to estimates of 2020 people in 2020 11,260. Its main sources of income are fishing, agriculture, beekeeping, and commerce¹⁰.

The population of this study included all breastfeeding mothers in the city. Since it is a research by census, sample size calculation was not necessary. All breastfeeding women in the city of Balneário Gaivota in 2019 were included, as long as they had delivered from January 1st, 2018, to December 31, 2018, and accepted participation by signing the Free and Informed Consent Form. Exclusion criteria were: mothers of twins; mothers diagnosed whose serology was contraindicative for breastfeeding; with total mastectomies; who were using medication that was contraindicative of breastfeeding per medical prescription; mothers whose infant was born with cerebral palsy, malformations, other neurological diseases, or any disorders due to which feeding needed to be done via tube; and those incapable of answering the questionnaire.

Before data collection, we contacted the Municipal Health Secretariat of Balneário Gaivota - SC, asking for an authorization to access information of breastfeeding mothers from neonatal heel prick test records. We invited all women by phone to come to the Municipal Health Secretariat of Balneário Gaivota to answer to the questionnaire. Data collection took place from March to June 2020. In the first stage of collection, 62 mothers answered to the questionnaire; as the pandemic reached its peak, collection was suspended. The second stage of collection took place during the National Campaign for Vaccination against Influenza. During this campaign, the mothers took their children to be vaccinated, creating an adequate occasion to resume collection. 44 mothers answered to the questionnaire in this stage. In total, 102 mothers participated.

All necessary care was used during collection. The interviewer and the mother used masks, alcohol gel, and kept a distance of 1.5m. Also, the mothers were advised to bring their own pens. The procedure was carried out in a private location, to ensure the safety and confidentiality of the information.

We used a questionnaire with closed questions about sociodemographic (age, marital state, educational level, income, skin color, area of residence, work activity), pregnancy (whether there were prenatal consultations, how many prenatal consultations, smoking, type of delivery, parity), and post-pregnancy (maternity leave length) information. To evaluate the knowledge of participants, the following questions were asked: “Up to what age should the baby be exclusively breastfed?” (Directly from the breast or milked, with no other liquids or solids); “Does breastfeeding bring benefits for both mother and baby?”; “Why is breastfeeding important for the newborn?”; “What is the best position to breastfeed?”; “How should the baby

suckle the breast?” (i.e., how should the mouth of the baby get in contact with the nipple of the mother); “Can the use of pacifiers influence the abandonment of exclusive breastfeeding?”; “Can the use of baby bottles influence in the abandonment of exclusive breastfeeding?”

We created the variable “Knowledge about the importance of breastfeeding and proper breastfeeding technique” and considered that all mothers who answered correctly five or more of these questions had adequate knowledge.

We double input all data into Microsoft Excel 2010®, checked data for consistency, and analyzed it using the statistical software SPSS, version 26.0.

The variables were presented using absolute and relative frequencies (%). We carried out a raw analysis of the association between exclusive breastfeeding and the independent variables using Pearson’s chi-squared and Fisher’s exact, with a significance level of 5%. Additionally, considering the adjusted analyses, we employed Poisson’s Regression, presenting, as measures of effect, the prevalence ratios, and their respective confidence intervals of 95%.

We created a hierarchical model to determine which factors were related with the dependent variable. Its first level (distal extremity) included: age and skin color. The second level included the variables: income, educational level, living area, work activity, and lives with or without a partner. The third level included: prenatal consultations, smoking, parity, maternal leave, and knowledge about breastfeeding. The fourth included “type of delivery”. The fifth included “prescription for child formula”. Finally, the sixth level (proximal extremity) included: use of pacifier and use of baby bottle. All variables with $p < 0.20$ were kept in the analysis as potential confounding factors¹¹.

The research began after the municipality gave its permission and the Research Ethics

Committee from the Universidade do Extremo Sul Catarinense gave its approval, on February 28, 2020, under protocol 3.889.177.

RESULTS

4 of the 106 mothers who delivered in 2018 in Balneário Gaivota were excluded, as they gave birth to twins. As a result, 102 mothers were included. Table 1 shows the characteristics of

the population analyzed and the raw analysis of the association between exclusive breastfeeding and the sociodemographic variables studied. The prevalence of exclusive breastfeeding was 43.1%. The mothers were 17 to 26 years old (24.3%; n = 35), lived with a partner (87.3%; n = 89), were white (76.5%; n = 78), had a income below one minimum wage (32.4%; n = 33), had a paid work (63.7%; n = 65), and received maternity-leave (56.9%; n = 58).

Table 1. Raw analysis of the association between exclusive breastfeeding* and the independent variables studied - Balneário Gaivota, Santa Catarina, 2020 (n=102)

Variables	Total		Exclusive breastfeed- ing (n=44)		P-value
	N	%	N	%	
Age					0.979 ^a
17-26	35	34.3	15	42.9	
27-36	50	49.0	22	44.0	
37-44	17	16.7	7	41.2	
Lives with partner					0.404 ^a
No	13	12.7	7	53.8	
Yes	89	87.3	37	41.6	
Skin color					0.438 ^a
White	78	76.5	32	41.0	
Black/brown	24	23.5	12	50.0	
Years of formal education					0.651 ^b
Incomplete elementary school	14	13.7	6	42.9	
Complete elementary school	14	13.7	9	64.3	
Incomplete high school	23	22.5	9	39.1	
Complete high school	25	24.6	9	36.0	
Incomplete higher education	12	11.8	4	33.3	
Complete higher education	14	13.7	7	50.0	
Family income (minimum wages)					0.108 ^a
<1	33	32.4	18	54.4	
≥1	69	67.6	26	37.7	
Zone of residence					0.089 ^a
Urban	86	84.3	34	39.5	
Rural	16	15.7	10	62.5	

Variables	Total		Exclusive breastfeeding (n=44)		P-value
	N	%	N	%	
Employment status					0.206 ^a
Unemployed	37	36.3	19	51.4	
Employed	65	63.7	25	38.5	
Maternity leave					0.994 ^a
No	44	43.1	19	43.2	
Yes	58	56.9	25	43.1	
Number of prenatal consultations					0.309 ^b
<5	4	4.0	3	75.0	
≥6	97	96.0	40	41.2	
Smoking during pregnancy					0.547 ^b
No	90	88.2	40	44.4	
Yes	12	11.8	4	33.3	
Type of delivery					0.253 ^a
Vaginal	45	45.1	17	37.0	
Cesarean section	56	54.9	27	48.2	
Parity					0.168 ^a
Primiparous	32	31.4	17	53.1	
Multiparous	70	68.6	27	38.6	
Pacifier use					0.004 ^a
No	31	30.4	20	64.5	
Yes	71	69.6	24	33.8	
Baby bottle use					0.006 ^a
No	18	17.6	13	72.2	
Yes	84	82.4	31	36.9	
Child formula prescribed at discharge					0.004 ^a
No	46	45.1	27	58.7	
Yes	56	54.9	17	30.4	
Knowledge about the benefits of breastfeeding					0.992 ^a
No	23	22.8	10	43.5	
Yes	78	77.2	34	43.6	

*Exclusive breastfeeding up to the sixth month of age. ^aChi-squared test. ^bFisher's exact.

Regarding factors related with exclusive breastfeeding, the use of baby bottles ($p = 0.007$) and the prescription of formula at discharge ($p = 0.002$) were associated with

exclusive breastfeeding even when adjusted for confounding factors. The babies who used baby bottles were 45% less likely to be exclusively breastfed up to their sixth month of age, when

compared to those who did not use the bottle (PR: 0.55, CI95%: 0.36-0.85). Moreover, babies who were prescribed formula at discharge were 54% less likely to be exclusively breastfed, when

compared to their peers (PR: 0.46, CI95%: 0.29-0.75). The other variables analyzed showed no statistical association with exclusive breastfeeding (Table 2).

Table 2. Adjusted analysis** of the association between exclusive breastfeeding* and the independent variables studied = Balneário Gaivota, Santa Catarina, 2020

(Continued)

Variables	Exclusive breastfeeding		
	PR	CI95%	P-value
Age			0.616
17-26	-	-	
27-36	1.06	0.64-1.75	
37-44	1.00	0.51-2.01	
Lives with partner			0.784
No	-	-	
Yes	0.91	0.48-1.74	
Skin color			0.422
White	-	-	
Black/brown	1.22	0.75-1.98	
Years of formal education			0.473
Incomplete elementary school	-	-	
Complete elementary school	1.60	0.78-3.26	
Incomplete high school	1.17	0.53-2.60	
Complete high school	1.11	0.48-2.55	
Incomplete higher education	1.09	0.38-3.13	
Complete higher education	1.91	0.75-4.83	
Family income (minimum wages)			0.112
<1	-	-	
≥1	0.70	0.46-1.09	
Zone of residence			0.067
Urban	-	-	
Rural	1.55	0.97-2.46	
Employment status			0.386
Unemployed	-	-	
Employed	0.82	0.52-1.28	
Maternity leave			0.380
No	-	-	
Yes	1.25	0.76-2.04	
Number of prenatal consultations			0.068
<5	-	-	
≥6	0.57	0.31-1.04	
Smoking during pregnancy			0.746

			(Conclusion)
No	-	-	
Yes	0.86	0.35-2.11	
Type of delivery			0.094
Vaginal	-	-	
Cesarean section	1.47	0.94-2.32	
Parity			0.114
Primiparous	-	-	
Multiparous	0.68	0.43-1.09	
Pacifier use			0.336
No	-	-	
Yes	0.79	0.49-1.27	
Baby bottle use			0.007
No	-	-	
Yes	0.55	0.36-0.85	
Child formula prescribed at discharge			0.002
No	-	-	
Yes	0.46	0.29-0.75	
Knowledge about the benefits of breastfeeding			0.873
No	-	-	
Yes	1.05	0.60-1.81	

*Exclusive breastfeeding up to the sixth month of age. PR: prevalence ratio CI95%: Confidence Interval 95%. **Adjusted considering a six-level hierarchical determination model.

DISCUSSION

An important finding of this study was the fact that nearly half the children were exclusively breastfed up to their sixth months of life. Furthermore, the main factors that directly interfered in the continuation of exclusive breastfeeding were the use of baby bottles and the prescription of formula at discharge. The prevalence of exclusive breastfeeding found in this study is quite similar to national data, which, according with WHO parameters, can be considered a reasonable indicator. More recent data on breastfeeding in Brazil show that 60% of children below 4 months are exclusively breastfed, while this rate falls to 45.7% for children up to 6 months of age. The results also indicated that this practice is more common in the south of Brazil (53.1%)⁸.

Exclusive breastfeeding is the most effective way to create a bond between mother and child, as it provides an adequate balance of nutrients and protects mother and child from several diseases¹². According with the WHO, this practice greatly benefits baby and mothers, protecting against gastrointestinal infections and malnutrition, which can take place both in developing and developed countries¹³.

Furthermore, breast milk is the best nutritional supplement for the baby, being seen by many researchers as a medication customized to the specific needs of each child¹⁴. Furthermore, these benefits are not exclusive to mother and child. They also extend to the quality of life of the family as a whole, since hospitalizations are less often needed and there are no extra costs associated with the purchase of artificial milk,

which can have an impact on the family income⁶.

Additionally, several studies have shown that breastfeeding is essential in the first thousand days of a baby's life, due to the fact that this is a vulnerable period in which metabolic programming takes place, molding future diet preferences, which are a risk factor for the development of several diseases in adulthood¹⁵.

Another relevant finding of our research is the fact that the use of baby bottles was negatively associated with exclusive breastfeeding, which corroborates the findings of other authors^{1,16,17,18}.

A research in Recife, Pernambuco, with children up to 2 years old attended in Primary Health Care Units, also evaluated breastfeeding, finding that most (82.8%) children used baby bottles, and showing a negative association between their use and exclusive breastfeeding¹⁷. This practice is inadvisable, since the bottle represents a source of contamination, reduces the time suckling on the breast, interferes in on-demand breastfeeding, and can delay the establishment of lactation^{13,14,15,16,17,18}.

These orientations are reiterated in the WHO guide about the ten steps for successful breastfeeding. One of its strategies is associated with providing guidance to mothers regarding the use and the risks of baby bottles, pacifiers, bottle nipples, and how they affect the practice of exclusive breastfeeding.¹³ An alternative to prevent early weaning is the use of cups, when mothers need to leave for work, or even of feeding breast milk to the baby using spoons¹.

The use of the baby bottle for children under 6 months may be a result of the fact that many mothers believe it has no effect on the child's development; and of the fact that they cannot withstand the cries of the baby in the first months¹⁹. According with the Ministry of Health, after breastfeeding starts, milk can take up to a minute to effectively leave the breast, while, in the case of the bottle, this is immediate. When the

child starts suckling on the breast, the flow may be slow and delay the milk, which can generate impatience and provoke crying. In this case, mothers should be advised both regarding the use of the baby bottle in time of breastfeeding, and regarding the potential delay in their milk flow¹.

Another factor that had a negative impact on exclusive breastfeeding in this research was the prescription of formula for newborns at discharge. A study²⁰ that analyzed the prescription of a food supplement in a university hospital considered to be "Child Friendly" found a prevalence of 16% in the prescription of the supplement. When the causes for this prescriptions were evaluated, the study found that only 6.2% of cases were in accordance with the Child Friendly Hospital Initiative, showing that this practice, unfortunately, is routine in maternities.

Although several studies have shown that using formula before the child reaches 6 months of age interferes in the permanence of exclusive breastfeeding, this type of supplement is still frequently prescribed in and out of maternities, even though breastfeeding rates in Brazil are below recommendations²¹.

It should be highlighted that many mothers continue feeding their baby supplements with artificial milk due to the fact they do not receive adequate information at discharge, believing they need to continue giving the supplement even after it is no longer necessary²². Another issue that can lead to the continuity of artificial milk supplementation is the belief that mother's milk is insufficient to sate the child's hunger; often, the constant crying of the baby can have causes beyond hunger, and can lead mothers to believe that they are producing "weak" milk¹.

Although participants in this research had facilitated access to health services and received guidance about the benefits of breastfeeding during nursing consultations, we also found that

a significant number of mothers did not know that the use of baby bottles and formula have a negative impact in exclusive breastfeeding. A study²³ with pregnant women in their prenatal found that, although they were aware of the importance of breastfeeding, they still believed many myths that can increase the likelihood of early weaning.

The findings of this study show even more clearly the need for actions in the field of health promotion, in order to increase the potential for individual and collective health and lower vulnerability and risks to health from social determinants.

To encourage this action, we must encourage breastfeeding and its benefits, especially during the prenatal. Throughout prenatal consultations, health workers have the duty to inform the mothers, emphasizing the importance of adequate technique when breastfeeding, and the benefits it brings to mother and child, such as the bond that is established between them, the decrease in child mortality, the protective effect against breast cancer, and others^{13,22}.

Furthermore, during orientation, the workers must identify the main factors that can lead to early weaning, among which the use of baby bottles and formula. The woman must receive support during breastfeeding, guidance on proper breastfeeding technique and information on the consequences of food supplements, and on the fact that it exposes the child to a greater risk for infections, which may even affect their adequate development.

Limitations of this work include the fact that, since this is a cross-sectional study, results must be evaluated carefully, since the reverse causality bias may affect interpretation.

It should be noted that, although the research was carried out in part during the SARS-CoV-2 pandemic, the campaign for the vaccination

of children from 6 months to 6 years enabled the interview of mothers eligible for the study.

Our findings suggest that factors related with exclusive breastfeeding are behavioral and modifiable. Therefore, professionals who work in maternities must raise the awareness of mothers about the importance of not offering child formula. Furthermore, the need for the use of artificial milk should be carefully evaluated at hospitals, since, often, the recommendation is unnecessary.

Regarding the use of the baby bottle, mothers often use it as a result of the prescription of artificial milk, without being aware of the negative effect it can have in the continuity of exclusive breastfeeding. Therefore, during prenatal, childcare, and child development follow up consultations, health workers must advise mothers to avoid such practices.

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