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Factors associated with exclusive breastfeeding in the first week of life in primiparous women

Fatores associados ao aleitamento materno exclusivo na primeira semana de vida entre primíparas

Factores asociados a la lactancia materna exclusiva en la primera semana de vida en mujeres primíparas

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ABSTRACT

Objective: to verify factors associated with exclusive breastfeeding in the first week of life in primiparous women.

Method: longitudinal study, with a probabilistic sample of 102 primiparous women assisted in two university hospitals in Minas Gerais and Rio de Janeiro, from December 2023 to April 2024, with favorable conditions for breastfeeding. An instrument validated by experts was applied. The chi-square and Fisher's exact tests were applied. Multiple analysis was performed using Poisson regression with robust variance estimation. The dependent variable was exclusive breastfeeding in the first week of life.

Results: 70.6% of the primiparous women performed exclusive breastfeeding in the first week of life. A bivariate analysis showed an association between type of breastfeeding at hospital discharge ($p<0.001$), complications with newborns after discharge ($p=0.038$) and use of pacifiers ($p<0.001$). The non-exclusivity of breastfeeding at time of discharge and the use of pacifiers explained the non-exclusivity in the first week of life.

Conclusion: This research identified factors that may interfere with breastfeeding and its exclusivity after hospital discharge. Practices should consider restricting the use of formulas and artificial nipples, reiterating the importance of professional support, especially in the transition from hospital to home.

Descriptors: Breast Feeding; Weaning; Parity; Infant, Newborn; Postpartum Period.

RESUMO

Objetivo: verificar fatores associados ao aleitamento materno exclusivo na primeira semana de vida entre primíparas.

Método: estudo longitudinal, com amostra probabilística de 102 primíparas assistidas em dois hospitais universitários localizados em Minas Gerais e no Rio de Janeiro, no período de dezembro de 2023 a abril de 2024, com condições favoráveis ao aleitamento materno. Foi aplicado instrumento validado por *experts*. Aplicaram-se testes qui-quadrado e exato de Fisher. Realizou-se análise múltipla por meio da regressão de Poisson com variância robusta. O aleitamento materno exclusivo na primeira semana de vida consistiu na variável dependente.

Resultados: entre as primíparas, 70,6% permaneciam em aleitamento materno exclusivo na primeira semana de vida. Análise bivariada apontou associação entre tipo de aleitamento na alta hospitalar ($p<0,001$), intercorrências com o neonato após a alta ($p=0,038$) e uso de bicos ($p< 0,001$). A não exclusividade do aleitamento materno no momento da alta e uso de bicos explicaram a não exclusividade na primeira semana de vida.

Conclusão: identificados fatores que podem interferir no aleitamento materno e sua exclusividade após a alta hospitalar. Recomenda-se reflexão sobre práticas e uso restrito de fórmulas e bicos, reforçando-se a importância de suporte e apoio profissional inclusive e fortemente, na transição do hospital para o domicílio.

Descritores: Aleitamento Materno; Desmame; Paridade; Recém-Nascido; Período Pós-Parto.

RESUMEN

Objetivo: verificar los factores asociados a la lactancia materna exclusiva en la primera semana de vida en mujeres primíparas.

Método: estudio longitudinal, con muestra probabilística de 102 mujeres primíparas atendidas en dos hospitales universitarios ubicados en Minas Gerais y Río de Janeiro, en el período de diciembre de 2023 a abril de 2024, con condiciones favorables a la lactancia materna. Se aplicó un instrumento validado por expertos. Se aplicaron las pruebas de chi-cuadrado y exacta de

Fisher. Se realizó un análisis múltiple mediante regresión de Poisson con varianza robusta. La lactancia materna exclusiva en la primera semana de vida fue la variable dependiente.
Resultados: el 70,6% de las primíparas permaneció con lactancia materna exclusiva en la primera semana de vida. El análisis bivariado mostró asociación entre el tipo de lactancia materna y el alta hospitalaria (p<0,001), las complicaciones con el recién nacido después del alta (p=0,038) y el uso de tetinas (p<0,001). La no exclusividad de la lactancia materna en el momento del alta y el uso de tetinas explicaron la no exclusividad en la primera semana de vida.
Conclusión: se identificó factores que pueden interferir con la lactancia materna y su exclusividad después del alta hospitalaria. Se recomienda reflexionar sobre las prácticas y el uso restringido de fórmulas y tetinas, reforzando la importancia del apoyo profesional, especialmente en la transición del hospital al hogar.
Descriptores: Lactancia Materna; Destete; Paridad; Recién Nacido; Periodo Posparto.

INTRODUCTION

Human milk is the most appropriate food for newborns and children, as it completely meets their nutritional needs up to their sixth month of life and has exclusive immune components[1]. Therefore, the World Health Organization (WHO), the Ministry of Health (MH), and the United Nations Children's Fund (UNICEF) recommend that children receive exclusive breastfeeding until their sixth month of life, combining exclusive breastfeeding while introducing food until they are two years old or older[2].

Eighty percent of newborns around the world receive breast milk at some point in life, 46% start breastfeeding in the first hour of life, and 48% are breastfed only until the sixth month of life[3,4]. Efforts are being made worldwide to trace strategies that can increase the rates of breastfeeding in the first hour of life to 70%, and to reach these same rates until the sixth month of the child[3,4]. In Brazil, the prevalence of exclusive breastfeeding (EBF) up to the sixth month of age is 45.8%[5]. Therefore, there are high levels of weaning among Brazilian children.

In Brazil, several strategies have been implemented over time to promote breastfeeding, based on positive evidence about the duration of EBF. Some of these strategies stand out, such as: 120 day maternity leave, ensured by the Federal Constitution since 1988, which can be extended for 60 extra days, providing fiscal benefits for citizen companies; the establishment of the Brazilian Standards for Food Trading for Breastfeeding Infants, which is also from 1992; the implementation of rooming-in in Brazilian maternities since 1993; the establishment and development of the Brazilian Network of Human Milk Banks, in 1998; the implementation of breastfeeding support rooms in companies, since 2000; the procedural standards to support the Kangaroo Method put in place in 2006; the creation of breastfeeding rooms in health care units to support working mothers in 2023; the provisions related to breastfeeding protection in the Brazilian Consolidation of Labor Laws; and others[6]. Nonetheless, the legal apparatus may be

insufficient to improve EBF rates, showing the relevance of professional support in the aid to breastfeeding mothers, especially when dealing with challenging situations.

An investigation with 576 postpartum mothers showed that 40% reported issues in the first week after delivery, such as babies with trouble latching (40%), and sore or cleft nipples, which reached the same proportion of 38% [7]. We also must note that nipple lesions usually come in the first week, affecting 29% to 76% of breastfeeding mothers. The pain that comes from these lesions, according to the Visual Analog Scale, is moderate[8]. A research with mothers in the first week after delivery showed moderate to severe pain related to breastfeeding, regardless of having or not lesions[9]. It is worth noting that pain or discomfort when breastfeeding is the second most common cause for weaning[10]. Thus, issues that are common, especially in the first postpartum week, can influence the decision to wean or continue breastfeeding.

The target audience of this study were primiparous mothers. Research suggested that primiparous women face more challenges when starting breastfeeding than multiparous ones, delaying its start[11]. A research with 80 breastfeeding mothers in Finland found that primiparous ones were 3.41 times more likely to have trouble breastfeeding[12]. An investigation with 140 primiparas pointed out that 58% were in exclusive breastfeeding at the sixth month. The main reasons for the early cessation of exclusive breastfeeding included the belief that they produced insufficient milk, and insufficient child weight gain[13].

The research issue this study attempts to solve are the factors associated with weaning in the first week of life, among primiparas. Considering how critical breastfeeding is in the first week, this issue emerges due to the challenges that lead to high levels of weaning in Brazilian children and the difficulties related to having children for the first time, all of which are justifications for this study.

The objective of this study was to verify which are the factors associated with first-week EBF in primiparous women.

METHOD

This is a longitudinal study nested within a clinical trial about the factors associated with EBF in the first week of life in primiparas in a teaching hospital. All recommendations from the STrengthening the Reporting of OBservational studies in Epidemiology guide were followed in the study[14]. Data was collected from December 2023 to April 2024.

The study was conducted in the rooming-in of a maternity of a town in the state of Minas Gerais (center A) and in a maternity in the city of Rio de Janeiro (center B). Both maternities are teaching-hospitals connected to Brazilian federal universities.

Center A is a public hospital, a reference for the resolution of high-risk pregnancies and infectious diseases during the pregnancy-postpartum period. It houses 12 beds for rooming-in and a standard operational protocol for breastfeeding assistance; however, the procedures include only actions to clinically manage breastfeeding. Center B is also a public hospital and provides multiprofessional outpatient and inpatient care to the health of pregnant women and high-risk newborns. Its rooming-in have nine wards, formed by five beds each, to a total of 45 beds. This institution earned the title of Child-Friendly Hospital in December 2020.

The study population consisted of primiparous women with the intention and conditions that allowed breastfeeding. The sample was calculated according to the randomized clinical trial associated with this study. A pilot study was conducted including 39 postpartum women. Nineteen of them were allocated into an intervention group (IG) and participated in counseling sessions about breastfeeding during hospitalization in the rooming-in, after data collection. Twenty women, on the other hand, were allocated into a control group (CG), receiving care from the institution with no additional intervention from the researchers; they were equally distributed in the centers that were the settings of this study. The exclusive breastfeeding rates at the sixth month for the IG reached 79%, reaching 46% for the CG, which allowed testing the viability of the study (80%) and carrying out a sample calculation for the clinical trial.

From these results, we used the application OpenEpi® for sample calculation, and confirmed its results using the application PASS®, with a significance level of 5% and a statistical power of 80%. Estimated indicated the inclusion of 88 women, with an expected loss of 15%. The final sample calculation recommended the inclusion of 102 women.

Inclusion criteria comprised primiparous women, over 18 years old, with singleton pregnancies, live births, gestational age from 37 to 42, weight at birth above 2,500g regardless of type of birth, who were hemodynamically stable, conscious, oriented, and hospitalized in the rooming-in of the centers at the time they were allocated for the study.

Exclusion criteria comprised women and neonates with some form of contraindication against breastfeeding (positive for HIV, HTLV 1 and 2, or ongoing neoplastic with chemotherapeutics); neonates with malformations that prevent or hinder breastfeeding; neonates who were separated from their mothers immediately after the umbilical cord was clamped due to adverse events involving the mother or the neonate, with the hospitalization of mother or child in critical care units; women transferred from other institutions or who were

already discharge (readmissions); women who made use of illegal drugs; and women diagnosed with intellectual or sensory deficits, with confirmed diagnoses in medical records.

This study also excluded any dyads in which malformations or abnormalities impaired the breastfeeding mechanisms, or when there was an alteration in the mother-child bond at the time of allocation. In both institutions, the mechanical evaluation of breastfeeding was carried out according to the institutional protocol, by trained professionals, in the first eight hours of life. In cases where no prior evaluation had been conducted, the researcher informed the team about their findings. If the mother detected any alteration in the mother-child bond, or any was detected, the researcher informed the team of it for later evaluations. Despite these measures, it is worth noting there was no exclusion during allocation.

Postpartum women who were not monitored in the first week, despite three unsuccessful attempts to contact them via phone or through relatives, would be considered follow-up losses. Still, there were no follow-up losses.

After receiving clarifications and accepting to participate in the study, women were invited to answer a form with four sessions, built by the researchers. The first version of the form was validated by eight external experts, all with proven experience in breastfeeding, reaching an agreement above 80% in all items.

The first session of the instrument is associated to sociodemographic variables (age in years; self-declared skin color; whether they lived in a partner, educational level, family income, paid work, and right to maternity leave). The second session of the form addressed clinical variables, including smoking, health issues, and continuous medication. The third session involved obstetric data, including prenatal consultations, counseling about breastfeeding in the prenatal, sources of guidance, and which professional provided it. The variables investigated regarding delivery included type of delivery, presence of a companion at delivery, skin-to-skin contact, and breastfeeding in the first hour of life. Still in this session, we collected information on weight and size at birth, and the gestational age of the newborn. This data was collected through an interview. When necessary, the records of the participants were reviewed.

To determine possible initial issues in breastfeeding, we used the LATCH scale[15]. The goal of this scale is to show the need of immediate interventions, referrals, and necessary support after hospital discharge. It evaluates the following items: L - Latching; A - Audible swallowing; T - Type of nipple; C - Comfort; H - Holding. The score of each item varies from zero to two. A total score of six or more suggests trouble in breastfeeding and the need for support [15,16]. The evaluation was conducted by a researcher, trained to apply the scale and the

research instruments, at a time that was appropriate for them to see the child being breastfed, respecting the willingness of the child.

Sociodemographic, clinical, and obstetric variables, as well as those related to delivery and the LATCH scale scores were collected during the allocation of the postpartum women in the rooming-in.

Follow-up was conducted on the 7th day after discharge. The participant was contacted using the phone number they informed at time of allocation and composed the last session of the instrument. At this time, researchers collected information on the type of breastfeeding at hospital discharge and in the first week of life of the neonate. This last question had three options for response: EBF; mixed feeding (breastfeeding complemented with formula); and artificial feeding (only formula). They were also asked about any complications, whether they affected the mother, the child, or the breastfeeding process itself. At least three attempts at phone contact with the participant were made in different times of day. Specifically, between 12:30 and 13:30, and between 16:00 and 17:00, or at a time chosen by the mother.

The primary outcome of the study was the rate of EBF in the first week of life of the newborn. The definition of EBF used was that of the WHO, including things such as the baby not receiving any other food or liquid apart from breast milk, not even water[3]. It is worth noting that, per definition, the use of prescribed medication when needed is an exception, that does not affect whether breastfeeding was exclusive[3]. The outcome was measured according to the reports of participants, given by phone. During the follow up, the mothers were asked about the type of feeding and whether water or other foods were used. They were asked whether the child was only breastfed, and if they gave them some type of liquid or food to the child during each follow-up call.

Data was collected in Google Forms® and imported into a Microsoft Excel® spreadsheet and later, to the Statistical Package for the Social Sciences, version 23.0. We carried out a descriptive analysis of the sociodemographic, clinical, obstetric, and neonatal variables (absolute and relative numbers, mean, standard deviation, and minimum and maximum values). The chi-squared and Fisher's exact tests, considering a 5% significance level. Additionally, prevalence ratio, with 95% confidence intervals, was calculated to evaluate the factors associated with EBF in the first week. The associations found were confirmed by a multiple analysis applied using a Poisson regression with a robust variance estimation, including variables with $p < 0.20$ in the bivariate analysis.

This study meets one of the objectives of a larger project, titled "Effectiveness of Individual Counseling During Exclusive Breastfeeding: Multicentric, Randomized, Parallel,

and Open Clinical Trial". This study was approved by the Research Ethics Committee of center A, under opinion No. 5,627,159, on September 6, and by that of center B under opinion No. 5,656,072, on September 21, 2022. The study was guided by Directives and Regulatory Norms of Research involving human beings, part of the National Resolution No. 466/2012/NHC/MH. It also followed all ethical precepts from the Declaration of Helsinki. A free and informed consent form was signed by all participants. To ensure the anonymity of the participants, they were identified using numerical codes.

RESULTS

102 postpartum women were included in this study. 51 (52.9%) of them were receiving care in a maternity that has the title of Child-Friendly Hospital, while 48 (47.1%) were in a maternity that was not accredited by this initiative.

Regarding their sociodemographic profile, participant age varied from 18 to 43 years old, with a mean of 25.77± 6.36 years. Twelve of them (11.8%) were older than 35. Most women self-declared brown (n=61%; 59.9%), lived with a partner (n=77; 75.5%), and had from complete high school to complete higher education (n=89; 87.3%). Sixty nine women (67.6%) reported earning from two to three minimum wages, while 33 (32.4%) reported an income of one minimum wage. Most women had a paid job (n=60; 58.8%), with formal employment relationships (n=52; 86.6%).

As for their clinical variables, six (5.9%) were smokers; 47 (46.1%) had health issues or developed health issues during pregnancy; and 33 (32.4%) used medications daily. The most commonly described issues were diabetes (n=22), hypertension (n= 15), and hypothyroidism (n=08), all of which were related to the pregnancy. It is important to note that the same woman could present more than one health issue simultaneously. The most common medications they used were methyldopa (n=13), insulin (n=08), and levothyroxine (n=07). None of their diseases or medications used were contraindications for breastfeeding.

Regarding gestational variables, all women underwent a prenatal, and the number of consultations varied from four to 30, with a mean of 9.10 ± 3.23 consultations. 97 (95.1%) had six or more consultations, as recommended by the Ministry of Health.

Most women received guidance about breastfeeding during their prenatal (n=62; 60.8%). Their most common sources of information were prenatal consultations (n=45), educational materials (n=21), and Internet consultations (n=21). When asked about which professional provided them with guidance, most mentioned the nurse (n=41), followed by

physicians (n=31), and nutritionists (n=08). In regard to sources and professionals, more than one answer could be given.

Most participants had delivered their child through cesarean sections (n=56; 54.9%), with 46 vaginal deliveries (45.1%). Most participants reported they did have a companion with them during delivery, childbirth, and postpartum (n=98; 96.1%). However, even when they were in good condition, only 66 (64.7%) of them had contact with their child after birth. Breastfeeding in the first hour of life only took place for 22 (21.6%) of the dyads.

The weight of the newborns varied from 2,550 to 4,155 g, with a mean of 3,208.61 ±415.64 g. The height ranged from 41.5 cm to 53 cm, with a mean of 47.73±2.28 cm. Gestational age varied from 37 to 41 weeks, with a mean of 38.89 ±1.27 weeks. Thus, it can be observed that all neonates were term, with appropriate weights for their age at birth, these being appropriate conditions for breastfeeding.

Thirty (29.4%) newborns were already receiving mixed or artificial feeding in the first week of their lives. Half the mothers (n=51; 50%) had some type of lesion in the nipple-areolar complex; most (n=56; 54.9%) reported pain when breastfeeding, especially at the beginning of breastfeeding (n =52; 91.1%), describing pulling (n =21; 37.5%) and pinching (n=05; 9.0%). Part of the women had breast engorgement (n =42; 41.9%), which required professional intervention and was an indicative of breast complications in the first week.

Most women (n=55; 53.9%) offered some type of artificial nipples for the neonate. The most common was the pacifier (n=28; 52.8%). Only some (n=43; 42.2%) of the newborns went through childcare consultations in the first week of life; 12 (11.8%) had some type of complication. Five complications (41.7%) led to the hospitalization of the newborn. Two of them were due to jaundice, one to dehydration, and one to trouble breathing. One newborn was hospitalized since their birth to treat congenital syphilis. Other complications mentioned included constipation (n=02), colic (n=02), higher than expected weight loss (n=01), continued difficulty in handling breastfeeding (n=01), and nasal congestion (n=01). The characterization of breastfeeding in the first week of life is described in Table 1.

Table 1 - Characterization of breastfeeding in the first week of life. Uberaba, MG, and Rio de Janeiro, RJ, Brazil, 2024

Variable	n(%)
Child feeding	
Exclusive	72(70.6)
Mixed	26(25.5)

Artificial	4(3.9)
Lesion in the nipple-areolar complex	
Yes	51(50)
No	51(50)
Pain during breastfeeding	
Yes	56(54.9)
No	46(45.1)
When the pain appeared during breastfeeding	
At the start	52(91.1)
All throughout	3(5.3)
After breastfeeding	1(3.6)
Breast engorgement	
Yes	42(41.2)
No	60(58.8)
Artificial nipple offered to the newborn	
Yes	55(53.9)
No	47(46.1)
Type of nipple offered	
Pacifier	28(52.8)
Pacifier and baby bottle	12(22.6)
Baby bottle	12(22.6)
Pacifier and silicone nipple shield	2(3.8)
Baby bottle and silicone nipple shield	1(1.0)
The baby went through a child care consultation	
Yes	43(42.2)
No	59(57.8)
Complications of the newborn in the first week	
Yes	12(11.8)
No	90(88.2)

Source: Research Data, 2024.

Table 2 shows the bivariate analysis of the association between sociodemographic variables and breastfeeding in the first week of life.

Table 2 - Association between sociodemographic variables and exclusive breastfeeding in the first week of life. Uberaba, MG, and Rio de Janeiro, RJ, Brazil, 2024

Variable	Exclusive breastfeeding in the first week of life		PR	95%CI	p
	Yes n(%)	No n(%)			
Age	.				
18 to 35	64(62.8)	26(25.5)			
> 35	8(7.8)	4(3.9)	0.938	(0.615 – 1.429)	0.744
Self-declared skin color					
White	11(10.8)	8(7.8)			
Non-white	61(59.9)	22(21.5)	1.269	(0.847 – 1.903)	0.263
Partner					
Lives with partner	52(50.9)	25(24.5)	0.844	(0.658-1.084)	0.315
Does not live with partner	20(19.6)	5(5.0)			
Educational level					
Complete high school or above	62(60.8)	27(26.4)			
Incomplete high school or below	10(9.8)	3(3.0)	0.906	(0.653 – 1.257)	0.751
Monthly family income					
Two or more minimum wages	52(50.9)	18(17.7)			
One minimum wage	20(19.6)	12(11.8)	1.189	(0.879 – 1.607)	0.248
Paid job					
Has a paid job	41(40.2)	19(18.6)	0.926	(0.722-1.188)	0.660
Does not have a paid job	31(30.4)	11(10.8)			
Maternity leave					
Yes	35(34.3)	19(18.6)	0.841	(0.655-1.079)	0.197
No	37(36.3)	11(10.8)			

Note: PR - prevalence ratio; 95% CI - 95% Confidence Interval.
Source: Research Data, 2024.

Table 2 shows that no sociodemographic variable was associated to EBF in the first week of life. Table 3 shows the associations between clinical, obstetric, and childbirth variables, as well as those from the hospitalization period and the EBF in the first week of life.

Table 3 - Association between clinical and obstetric childbirth variables and the period of hospitalization and exclusive breastfeeding in the first week of life. Uberaba, MG, and Rio de Janeiro, RJ, Brazil, 2024

Variable	Exclusive breastfeeding in the first week of life		PR	95%CI	P
	Yes	No			

	n (%)	n (%)			
Maternity is a Child-Friendly Hospital					
Yes	40(39.2)	14(13.7)	1.111	(0.861 – 1.434)	0.515
No	32(31.4)	16(15.7)			
Smoking					
Yes	4(4.0)	2(1.9)	0.941	(0.527-1.681)	1.000
No	68(66.7)	28(27.4)			
Previous health problems or during pregnancy					
Yes	30(29.4)	17(16.7)	0.836	(0.644-1.085)	0.195
No	42(41.1)	13(12.8)			
Daily use medications					
Yes	23(22.6)	10(9.8)	0.981	(0.749-1.287)	1.000
No	49(48.0)	20(19.6)			
Number of prenatal consultations					
≥6	68(66.7)	29(28.4)	0.876	(0.555-1.384)	1.000
≤6	4(4.0)	1(0.9)			
Received guidance about breastfeeding during the prenatal					
Yes	46(45.1)	16(15.7)	1.141	(0.871-1.496)	0.376
No	26(25.5)	14(13.7)			
Type of delivery					
Vaginal	36(35.3)	10(9.8)	1.217	(0.950-1.559)	0.134
Cesarean section	36(35.3)	20(19.6)			
Skin-to-skin contact					
Yes	49(48.0)	17(16.7)	1.162	(0.875-1.543)	0.363
No	23(22.5)	13(12.8)			
Breastfeeding in the first hour of life					
Yes	17(16.6)	5(4.9)	1.124	(0.858-1.473)	0.599
No	55(54.0)	25(24.5)			
Newborn received formula (complement) during hospitalization					
Yes	26(25.5)	17(16.6)	0.076	(0.588-	0.078

				1.023)	
No	46(45.2)	13(12.7)			
LATCH scale scores according to time of life					
≥6	58(56.8)	20(19.6)			
				(0.887-	
	14(13.8)	10(9.8)	1.275	1.831)	0.199
≤6					
Type of nipple					
Non-protruding	15(14.8)	11(10.8)	0.769	(0.540-	0.134
				1.096)	
Protruding	57(55.8)	19(18.6)			
Lesions in the nipple-areolar complex during hospitalization					
Yes	10(9.8)	3(2.9)	1.104	(0.796-	0.751
				1.533)	
	62(60.8)	27(26.5)			
No					
Pain during breastfeeding					
Yes	45(44.1)	18(17.7)	1.032	(0.795-	0.826
				1.340)	
No	27(26.4)	12(11.8)			
Type of breastfeeding at discharge	67(65.6)	13(12.8)			
Exclusive					
	5(4.9)	17(16.7)	3.685	(1.695-	**<0.001**
Non-exclusive (mixed or artificial)				8.011)	

Note: PR - prevalence ratio; 95% CI - 95% Confidence Interval; LATCH - Latching, Audible swallowing, Type of nipple, Comfort, Holding.
Source: Research Data, 2024.

According to table 3, the variable "non-exclusive breastfeeding", that is, the practice of mixed or artificial breastfeeding at discharge, was significantly associated to the practice of breastfeeding in the first week of life ($p<0.001$). An analysis of the prevalence ratio showed that non-exclusive breastfeeding in the first week of life was 3.68 greater in dyads that were not in EBF at the time of discharge. Table 4 shows the analysis of the associations between variables in the first week of life and breastfeeding.

Table 4 - Association between the variables in the first week of life and exclusive breastfeeding. Uberaba, MG, and Rio de Janeiro, RJ, Brazil, 2024

Variable	**Exclusive breastfeeding in the first week of life**		**PR**	**95%CI**	**p**
	Yes n (%)	**No n (%)**			
Lesion in the nipple-areolar complex in the first week					

Yes	35(34.3)	16(15.7)	0.946	(0.736 – 1.216)	0.828
No	37(36.2)	14(13.8)			
Pain when breastfeeding in the first week					
Yes	38(37.2)	18(17.7)	0.918	(0.716-1.178)	0.522
No	34(33.4)	12(11.7)			
Breast engorgement in the first week					
Yes	34(33.4)	8(7.9)	1.278	(1.003-1.628)	0.077
No	38(37.2)	22(21.5)			
Newborn complications in the first week					
Yes	5(4.9)	7(6.9)	2.283	(1.260-4.135)	**0.038**
No	67(65.7)	23(22.5)			
Use of artificial nipples					
Yes	28(27.4)	26(25.5)	5.778	(2.172-15.367)	**<0.001**
No	44(43.1)	4(4.0)			

Note: PR - prevalence ratio; 95% CI - 95% Confidence Interval.
Source: Research Data, 2024.

Complications with the newborn (p=0.038) and the use of artificial nipples (p<0.001) were significant for breastfeeding in the first week of life. The prevalence ratio showed that non-exclusive breastfeeding was 2.28 times higher in newborns with complications and 5.78 times higher in those who used artificial nipples.

To ratify the results of the association between variables and EBF rates in the first week, the appropriate variables were inserted into a Poisson regression with a robust variance estimation. These variables were breastfeeding at hospital discharge (p<0.001), complications with the newborn (p =0.038), and artificial nipple use (p<0.001). In turn, the variables right to maternity leave (p=0.197), health problems (p=0.195), type of delivery (p=0.134), use of formula/complement by the NB during hospitalization (p=0.078), scores on the LATCH scale according to time of life (p=0.199), non-protruding nipples (p=0.134), and breast engorgement (p=0.777) were inserted into a regression model, since their p-values were below 0.200.

Table 5 shows the variables inserted into the Poisson regression model with robust variance estimation, prevalence ratios, p-values, and respective confidence intervals.

Table 5 - Poisson regression model with robust variance estimation between exclusive breastfeeding in the first week of life and significant variables. Uberaba, MG, and Rio de Janeiro, RJ, Brazil, 2024

Variable	PR	95%CI		p
Right to maternity leave	0.049	-0.075	0.120	0.653
Previous health problems/pregnancy	0.048	-0.132	0.580	0.442
Type of delivery	0.053	-0.188	0.019	0.109
Use of formula/complements during hospitalization	0.054	-0.163	0.049	0.293
LATCH scale scores according to time of life	0.064	-0.210	0.042	0.190
Non-protruding nipple	0.061	-0.070	0.168	0.420
Type of breastfeeding at discharge	0.063	-0.466	-0.218	**<0.001**
Breast engorgement	0.055	-0.178	0.380	0.204
Use of artificial nipples	0.055	0.135	0.350	**<0.001**
Complications in the first week	0.082	-0.023	0.298	0.094

Note: PR - prevalence ratio; 95% CI - 95% Confidence Interval; LATCH - Latching, Audible swallowing, Type of nipple, Comfort, Holding.
Source: Research Data, 2024.

After the regression model was applied, the type of breastfeeding at discharge, and the use of artificial nipples explained the non-exclusivity of breastfeeding in the first week of life.

DISCUSSION

Results indicated that 70.6% of primiparous women were offering exclusive breastfeeding in the first week of life. Nearly half had some complication related to breastfeeding in this period (pain, lesion, or engorgement). Nonetheless, non-exclusive breastfeeding was associated with the type of breastfeeding at time of discharge (non-exclusive) and with the use of artificial nipples.

It stands out that most participants lived with a partner, had from high school to higher education, and a family income varying from two to three minimum wages, working in paid jobs with formal employment relationships. Furthermore, most of them received counseling about breastfeeding during their prenatal, meaning that their intention of providing EBF may be related to these characteristics, seeing as, in literature, there are several obstacles to breastfeeding. These obstacles include lack of guidance [17], low educational levels[17,18], fear of pain[17], being primiparous[17], persuasion of relatives in the family environment[19], and an ineffective support network [17-19].

The maternity accredited with the Child-Friendly Hospital did not present better results regarding formula use. A previous study, which analyzed the 25 years since the implementation

of the strategy in the national territory, highlighted that despite the greater number of accredited maternities, the current challenge is engaging, integrating, and increasing the rapport of health teams, and adjustments are still needed to comply with all standards, especially after being recognized as Child Friendly units[20]. A Korean study also stands out in this regard, in which teams that work with breastfeeding pointed out the same issues, recognizing that breastfeeding requires qualified listening, and asks large time investments from professionals, which are often compromised by other demands or activities[21]. Therefore, we strongly recommend reviewing the practices, especially in institutions that have this accreditation.

The type of breastfeeding at time of discharge influenced its continuity in the first week of life. According to the WHO, one third of newborns receive formula after their birth and during their stay in rooming-in. Only 30% of newborns who do so go back to EBF at discharge, while 70% choose using only formula[3]. This shows its impact, how critical it is, and that it must only be indicated when strictly necessary.

The use of infant formula during the breastfeeding process, especially in the first days and, more specifically, before breastfeeding starts, requires special attention.

Nearly 50% of breastfeeding mothers believe their milk is weak or insufficient, which is the most common reason for weaning around the world[22]. Another point of vulnerability is related to the physiological aspects of infant crying, given that, in their first weeks, newborns can cry from one to three hours, continuously or sporadically. This response to physiological adaptation can be interpreted mistakenly as hunger, and a mother that does not have this information may think the crying lends credence to the belief that the milk of the postpartum mother is insufficient. Additionally, pressure from relatives, caused by a mistaken understanding of the physiology of lactation, may have a direct influence on the mother's choice to introduce formula[22], especially after discharge.

A Brazilian study with 415 newborns showed that 51.3% received complements (in the first hour of life for 57.6% of these), while only 50.7% were prescribed by the physician. The belief that there is a colostrum deficiency was the main reason for the indication (33.8%). Being under 30 years of age for mothers was found to be a protective factor, while being a first-time mother and having gone through a cesarean section were risk factors for the introduction of formula[23]. This study reiterates the importance of providing counseling to primiparas, who are its subjects. The research "Born in Brazil: National Survey on Delivery and Childbirth" included more than 14 thousand dyads, pointing out that 21.2% of newborns received formula during their stay in the joint accommodations, but this was only plausibly justified in 5% of cases[24].

Data points out that one third of newborns receive formula even before being breastfed, and in their first three days of life. This can have a high impact in the beginning, continuity, and duration of breastfeeding, especially in regard to EBF [22]. The early introduction of formula during maternity stay can give strength to the idea that it is the best nutritional resource for the newborn, influencing the decisions made by mothers after discharge.

In this regard, an American study with 5,310 newborns pointed out that the risk of early weaning increased from 2.5 to 6 times when the children received formula during post-delivery hospitalizations[25]. Reiterating these findings, a research with 2,369 in Hong Kong showed that providing only human milk and avoiding pacifiers or baby bottles in the first 48 hours after delivery were associated to a lower risk of non-exclusive breastfeeding[26]. These studies indicate how crucial these initial moments are for the continuity of exclusive breastfeeding.

Newborns that use artificial nipples were five times less likely to be in exclusive breastfeeding in the first week of life, showing the influence of these on breastfeeding. A cross-sectional study with 6,107 mothers who searched for help in a human milk bank showed that 31.3% of them used some type of artificial nipple. The use of these tools was the lowest among women who received prenatal counseling about breastfeeding and were providing exclusive breastfeeding according to the demands of the baby[27]. Nonetheless, evidence on the use of artificial nipples and their influence over EBF is still inconclusive, as indicated by a systematic review with meta-analysis[28].

According to an American study[29], the reasons to use a pacifier involve reducing crying and increasing infant sleep. However, when evaluating their reason for using it, primiparas have reported that they started using it because of their grandmothers, with 79% reporting use in the family and influences from their support network. Authors have warned that it is necessary to explore why they are used through non-judgmental dialogical relationships [29], since their use can be due to exhaustion, influenced by the mental health of the mother, or be strongly influenced by family relatives. It is also work reiterating the influence of the support network for primiparas as a source of information. Thus, it is relevant to involve the entire network in health counseling.

It is worth noting that, although the use of baby bottles and pacifiers is heavily criticized, there is no evidence that proves they are harmful to breastfeeding. Still, it must be emphasized that they represent a serious risk when not appropriately cleaned, or in cases when resources such as clean drinking water are missing, as they can lead to gastroenteritis, which is one of the main causes of neonate death, as a Finnish study pointed out[30]. Therefore, their use should not be recommended.

Both the weaning and the continuity of breastfeeding are complex and multifactorial processes, which involve not only the physiology of lactation, but social interactions, fears, insecurities, beliefs, and the meanings built by this complex network of factors[31]. All these factors must be evaluated in order to protect and promote breastfeeding.

Limitations of this study included the fact that only primiparous women were included in our sample, which prevents us from generalizing the results. Nonetheless, the goal of the researchers was to evaluate a homogeneous sample. This limitation, however, has the potential to lead into future studies that include multiparous participants.

The fact that this study is a part of a larger study can also be considered as a limitation, since the sample was calculated according to the objectives of the larger study. The large confidence intervals and variability can indicate that a higher sample size to evaluate exclusive breastfeeding in the first week could lead to more trustworthy results, helping identify other associations, which can compromise the generalization of results. Further research should be conducted with a larger sample and higher statistical power (above 90%), to achieve greater results.

Information bias is also a possibility, since the main outcome was collected via phone. However, it is worth noting that the participants received guidance about the outcome when they were allocated, and the question was detailed by the researchers during the phone contact, according to the concept of the WHO for exclusive breastfeeding. Thus, we suggest further studies that use in-person methods or video calls, for a more precise evaluation of breastfeeding after hospital discharge.

Studies about breastfeeding in the first week after hospital discharge and its associated factors are a gap in literature, due to the scarcity of research on the topic, which limits our ability to compare data, even as it reiterates the unprecedented nature of this study.

Considering the limitations above, it is important to keep in mind that, despite the importance of our results, they must be interpreted with caution. This gap can be addressed by new studies, with the highest possible sample, more robust designs - such as longitudinal studies with longer follow up, in-person contact, or randomized clinical trials -, and those that are focused on breastfeeding and its associated factors in the transition period from discharge to the first week of life at home.

Still, despite its restrictions and limitations, our results already indicate that, despite many policies to encourage breastfeeding, support is still needed, especially in the first week after childbirth.

It is also worth considering the importance of nurses. Nurses were the most commonly mentioned professionals when it comes to guidance about breastfeeding during the prenatal. Furthermore, the nursing team accompanies the dyad for 24 hours, providing care and clinical management during rooming-in stays. American studies show that dyads who receive care from nurses in rooming-in tend to continue exclusive breastfeeding during hospitalization, discharge, and after discharge[32,33], highlighting how crucial the professional is to provide support to the beginning of breastfeeding.

As for the implications of this study to practice, our results can instigate reflections on health care practices, the adoption of good practices, and the careful use of formula, only in cases that can help promote and protect breastfeeding.

CONCLUSION

Non-exclusive breastfeeding during the hospitalization of dyads in rooming-in, newborn complications after discharge, and artificial nipple use were associated to the non-continuity of exclusive breastfeeding in the first week of life of newborns. Additionally, non-exclusive breastfeeding at the time of discharge and artificial nipple use were confirmed, in the final model, as predictors of non-exclusive breastfeeding in the first week of life.

Furthermore, these results show the need for best discharge planning, with better engagement, rapport, and integration of the team and the dyad's. The hospitalization period and the nursing work during the stay of the dyad in the rooming-in also stand out as crucial, and the same can be said about the importance of providing support and professional care to continue breastfeeding during hospitalization and after hospital discharge.

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Data and material availability:

O acesso ao conjunto de dados poderá ser realizado mediante solicitação ao autor correspondente.The dataset may be accessed upon request to the corresponding author.

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