Original Article

Breastfeeding in premature infants discharged from baby-friendly hospitals in southeastern Brazil

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ABSTRACT

To describe the prevalence of exclusive breastfeeding (EBF) and associated factors in hospital discharge, in the first month after discharge and at six months of age of preterm infants attended at two Baby-Friendly hospitals in Southeastern Brazil. Descriptive, prospective study. Participants were 84 premature infants discharged throughout three months and 71 mothers who met the inclusion criteria. Data collection in medical records and interviews with mothers with use of a structured instrument. In hospital discharge and in the first month at home, 31.0% of the sample were in EBF, and at six months of age, the percentage was 9.1%. The following were associated with EBF in discharge: marital status, maternal occupation, prenatal consultations, type of delivery, gestational age, birth weight, length of hospital stay, and mechanical ventilation. In the first month after discharge: marital status, maternal occupation, prenatal consultations, type of gestation and length of hospital stay. At six months: family income. Rates of EBF in preterm infants fall short of recommendations thereby, special intervention programs are needed.

Descriptors: Breast Feeding; Infant, Premature; Prevalence; Neonatal Nursing.

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INTRODUCTION

Premature birth was the leading cause of neonatal deaths worldwide in 2013[1]. Exclusive breastfeeding (EBF) is an important ally in reducing neonatal morbidity and mortality; prevents infections, atopic, cardiovascular and celiac diseases, diarrhea, necrotizing enterocolitis, leukemia; promotes optimal growth and neurodevelopment of prematurity; improves intelligence quotient; reduces behavioral disorders and attention deficit; reduces risk of sudden death; and encourages the mother-baby bond[2-3].

Therefore, maternal breastfeeding (BF) promotes short- and long-term health, economic and environmental advantages for children, mothers and the society[4]. However, the practice of EBF in premature infants is challenging, mainly given their physiological and neurological immaturity. Maintaining BF in preterm infants is hampered by mothers' feelings of guilt, anxiety and depression during and after discharge, maternal belief in insufficient milk, tobacco use, artificial milk supply, baby fragility and difficulties with breast sucking, possible neonatal sequelae, the premature infant's time of hospitalization, and consequently, mother-child separation time[5].

In addition, breastfeeding a premature infant is complex and influenced by innumerable maternal, neonatal, perinatal and socioeconomic factors, besides clinical practices, the physical environment of neonatal units, and the health team's support and knowledge in maternal breastfeeding[6].

The Baby-Friendly Hospital Initiative (BFHI) emerged as a public policy to encourage breastfeeding of full-term and healthy babies. However, this strategy has not proved sufficient in Brazilian hospitals for generating favorable professional attitudes and hospital routines for maintaining BF in hospitalized preterm infants in neonatal intensive care units[7].

Studies on BF prevalence in premature infants are often related to other outcomes or some intervention. Recent studies on the prevalence of BF have been developed with preterm infants younger than 37 weeks[6] and late and moderate preterm infants[8]. The designs varied from documentary studies[6] to prospective cohort[9-11], and sampling ranged from 21[12] to 68,886 premature infants[8]. In general, national studies show reduced sampling. In discharge, the prevalence of EBF in preterm infants ranged from no exclusively breastfed infant[10] to 68.0%[9,11]. From seven to 15 days after discharge, 47.6% of premature infants were in EBF[12] and at six months, 41.4%[13]. Prospective studies with follow-up from birth to the sixth month of life of preterm infants are scarce.

In spite of incentives and advances in recent years, the prevalence of breastfeeding in preterm infants has fallen short of that recommended by the Ministry of Health and the World Health Organization (WHO)[2,14]. In Sweden, a country with high rates of EBF and pro-breastfeeding actions, was experienced a significant drop in EBF of preterm infants in hospital discharge during a 10-year period, especially in extremely premature infants[6].

Breastfeeding is the main indicator related to the child's nutritional status in the first 12 months of life and its monitoring contributes to decision making, reorganization of services and planning of actions in order to improve the quality of services offered to children[15]. Thus, EBF rates are important health indicators and studies on the prevalence of EBF in preterm infants can help in the assistance and care of these at-risk clients.

The objective of this study is to describe the prevalence of EBF and the associated factors in hospital discharge, during the first month after discharge, and at six months of life in preterm infants assisted at two Baby-Friendly hospitals in the Southeast region of Brazil. Data is expected to contribute for the adoption of evidence-

based interventions and care routines for the promotion and support to women/mothers and family in the breastfeeding of premature infants.

METHOD

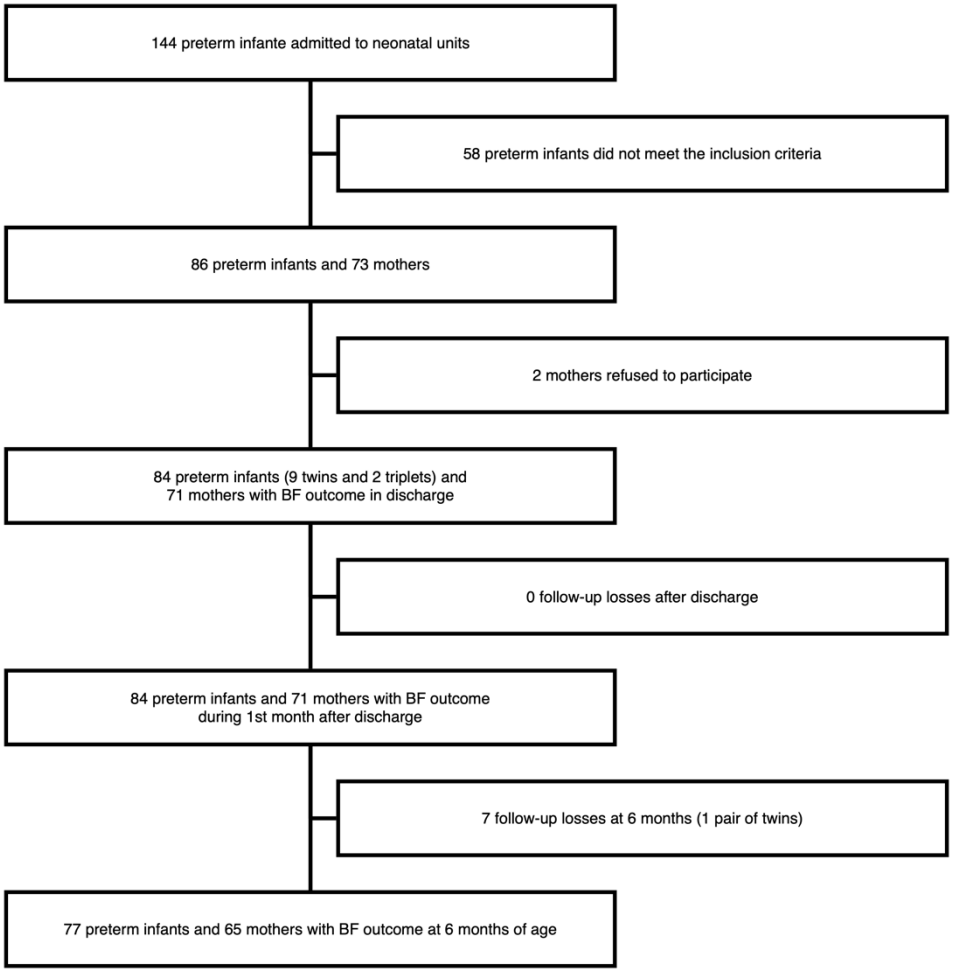
A prospective, descriptive, quantitative study. It was conducted in the neonatal units of two public hospitals that are reference for risk neonates, accredited as Baby-Friendly Hospitals and located in two capital cities of the Southeast region of Brazil.

Project approved by the Research Ethics Committee under opinion number 914.135 and CAAE number 23975813.7.1001.5393 after the consent of hospitals and follow-up clinics. All mothers signed the Informed Consent form, and underage mothers expressed their consent by signing with their responsible person.

The sample included all preterm infants discharged throughout a three-month period (April to July/2014 at the hospital in São Paulo, and August to November/2014 at the hospital in Rio de Janeiro) and who met the following inclusion criteria: gestational age <37 weeks; hospitalization in the Neonatal Intensive Care Unit (NICU) and/or Neonatal Intermediate Care Unit and/or Kangaroo Care Unit in the first 48 hours of life; minimum of 48 hours of hospitalization; and mothers with cognitive ability to answer questions. Premature infants and mothers with temporary or permanent breastfeeding contraindications and those who died were excluded.

The flowchart of recruitment and follow-up of premature infants is shown in Figure 1.

Figure 1: Flowchart of participants' recruitment and follow-up of the outcome of breastfeeding in premature infants.



Sociodemographic, obstetric, birth and hospitalization data, as well as information about first received milk, beginning of breastfeeding and type of feeding in hospital discharge were collected from medical records. Missing data on medical records were collected in interviews with mothers. Data on BF in the first month after discharge (7^{th}-30^{th} day) and at the sixth month of life (six months and zero days to six months and 29 days) were collected through a food recall in the last 24 hours in an interview with mothers on the day of consultation at the outpatient clinic of the hospital or by telephone, if the premature had no return consultation in this period or did not attend the consultation.

A structured questionnaire was used for data collection in medical records and with mothers. It was written by a group of BF specialist researchers through a literature review validated after a pilot test in nine Brazilian hospitals, and used in a multicenter project included in notice number 05/2013 MCTI/CNPq/MS/SCTIE/Decit/ Bill & Melinda Gates Foundation.

EBF was considered a primary outcome at the three analyzed moments. Categorization of the type of BF followed the WHO definitions, namely: EBF (only human milk, milked mother's milk or donated from the human milk bank-HMB), and possibility of receiving vitamins, mineral supplements or medicines; predominant BF (milked mother's milk or milk from the HMB, and possibility of receiving water, sugary water, infusions, teas, fruit juice, oral rehydration solution, vitamins, mineral supplements and medicines); BF (milked mother's milk or milk from the HMB plus formula and/or milk substitutes) and complementary feeding (BF, milked mother's milk or milk from the HBM, and semi-solid and solid foods, and allowed to receive infant formula and other liquid foods - appropriate term to describe feeding practice in children aged six months or older)[14]. The latter type was coded as AM+ complementary feeding given the inclusion of the classification of artificial feeding (formula and/or breast milk substitute only) with or without complementary feeding.

The outcome of EBF (yes and no) was used in association with the investigated variables selected according to clinical practice and scientific literature, and categorized according to a multicenter study to which this study is linked.

Data were entered into IBM-SPSS Statistics® 21.0 and was performed data consistency analysis. Descriptive statistics (mean, standard deviation, median and frequency distribution) was performed in order to characterize the sample and describe the prevalence of BF. For association tests, were performed the Chi-square and Fisher's Exact tests in IBM-SPSS Statistics® 21.0 and R® i386 3.0.0, respectively. Significance level was set a 5%, and the prevalence of EBF was estimated with a 95% confidence interval.

RESULTS

The study included 84 premature infants, 38.1% (32) from the hospital in Rio de Janeiro and 61.9% (52) from the hospital in São Paulo.

The sociodemographic and perinatal characteristics of mothers are presented in Table 1, and characterization of neonates at birth and during hospitalization is shown in Table 2.

Eighty-three percent (70) of preterm infants were admitted to the NICU, with a mean of 16.3 (± 20.6) days and median of 10.0 days. In the Neonatal Intermediate Care Unit, 84.5% (71) were hospitalized with a mean of 15.1 (± 16.1) days and median of 8.0 days. Only 16.7% (14) of premature infants at the hospital in Rio de Janeiro

were hospitalized at the Kangaroo Care Unit, mean of 13.8 (± 10.8) days and median of 14.5 days. In the shared hospital room, 48.8% (41) of infants were hospitalized with their mothers, mean of 5.6 (± 3.4) days and median of 5.0 days.

Table 1: Distribution of mothers of premature infants admitted to neonatal units according to sociodemographic and perinatal characteristics. Southeast region, Brazil, 2014.

Variables		N	%	Mean (SD)	Median	Min-Max
				26.5 (±7.4)	25.0	14-43
Maternal age	<21 years	19	22.6			
	≥21 years	65	77.4			
Maternal education	Primary school	25	29.8			
	Secondary school	50	59.5			
	Higher education	9	10.7			
Marital status	Single	39	46.4			
	Married	28	33.3			
	Consensual union	15	17.9			
	Widow	2	2.4			
Parents live together	Yes	65	77.4			
	No	19	22.6			
Family income	<1 minimum wage	8	9.5			
	1-2 minimum wages	49	58.3			
	3-5 minimum wages	12	14.3			
	>5 minimum wages	8	9.5			
	Ignored	7	8.3			
Maternal occupation	Housewife	33	39.3			
	Paid occupation	44	52.4			
	Student	7	8.3			
Prenatal care	Yes	83	98.8			
	No	1	1.2			
				7.2 (±2.8)	7.0	2-15
Number of prenatal visits	<6 consultations	21	25.0			
	≥6 consultations	53	63.1			
	Ignored	10	11.9			
Prior breastfeeding history	Not applicable (primiparous)	48	57.1			
	Yes	33	39.3			
	No	3	3.6			
Prior history of premature birth	Not applicable (primiparous)	48	57.1			
	No	25	29.8			
	Yes	11	13.1			
Current gestation type	Single	51	60.7			
	Double	25	29.8			
	Triple	8	9.5			
Intercurrences during pregnancy	Yes	50	59.5			
	No	34	40.5			
Intercurrences at delivery	No	80	95.2			
	Yes	4	4.8			
Type of delivery	Cesarean	50	59.5			
	Vaginal/forceps	34	40.5			

SD = Standard deviation

During hospitalization, 65.5% (55) of premature infants had respiratory distress syndrome; 16.7% (14) hyaline membrane; 25% (21) sepsis; 8.3% (7) intracranial hemorrhage; 6% (5) necrotizing enterocolitis; and 4.8% (4) had other infections.

The first milk prescribed for premature infants was administered between one and 480 hours of life, mean of 47.5 (± 78.8) hours and median of 19 hours. The majority (97.6% -82) started with human milk (pasteurized maternal and/or raw milked mother's milk and/or human milk from the HMB) administered by gavage and use of a syringe, infusion pump or not (81.0% -68).

Table 2: Distribution of preterm infants according to birth characteristics and clinical conditions during hospitalization. Southeast region, Brazil, 2014.

Variables		N	%	Mean (SD)	Median	Min-Max
Sex	Female	49	58.3			
	Male	35	41.7			
				33.0 (±2.8)	34	26-36
Gestational age	<32 weeks	19	22.6			
	32-34 weeks and 6 days	45	53.6			
	≥35 weeks	20	23.8			
				1790 (±623.9)	1730	490-3295
Birth weight	<1500g	26	31.0			
	1500-2499g	47	56.0			
	≥2500g	11	13.1			
Apgar 1 minute	<6	13	15.5			
	≥6	71	84.5			
Apgar 5 minutes	<6	1	1.2			
	≥6	83	98.8			
Resuscitation in the delivery room	No	59	70.2			
	Yes	25	29.8			
Skin-to-skin contact at birth	No	55	65.5			
	Yes	21	25.0			
	Ignored	8	9.5			
BF in the first hour of life	No	75	89.3			
	Yes	1	1.2			
	Ignored	8	9.5			
				31.5 (±26.5)	21.5	4-137
Total hospitalization time	≤15 days	26	31.0			
	16-29 days	28	33.3			
	≥30 days	30	35.7			
Use of ventilatory support and/or oxygen therapy	Yes	56	66.7			
	No	28	33.3			
				9.2 (±14.6)	3.5	1-64
Time of use of ventilatory support* (IMV/CPAP/BIPAP)	≤3 days	27	50.0			
	4-6 days	10	18.5			
	≥7 days	17	31.5			
				4.0 (±5.6)	2.0	1-20
Time of use of oxygen therapy ** (helmet/halo/catheter/nasal cannula/O2 in incubator)	≤2 days	15	78.9			
	3-6 days	1	5.3			
	≥7 days	3	15.8			

SD = standard deviation; BF = Breastfeeding; IMV = Invasive mechanical ventilation; CPAP = Continuous positive airway pressure; BIPAP = Bi-level positive airway pressure; * n = 54; ** n = 19

The onset of breastfeeding was considered when the premature infant was placed in contact with the breast for the first time in order to be fed. It occurred in the postnatal age of five to 2,448 hours, mean of 447.3 (± 525.9) hours and a mean of 216.0 hours of life; corrected age from 32.3 to 41.3 weeks, mean of 35.7 (± 1.8) and median of 35.5 weeks; weight of 1,400 to 3,250g, mean of 1,957,8g (± 449,1) and median of 1,782,5g. The predominant feeding technique in this first breastfeeding was direct breast sucking and catheter (51.2% -43), followed by breast and cup (27.4% -23).

In hospital discharge, the corrected age of premature infants ranged from 33.1 to 50 weeks, mean of 37.5 (± 2.6) and median of 37.2 weeks. The weight varied from 1.790g to 3.550g, mean of 2212.7g (± 433.3) and median of 2027.5g. Table 3 shows the prevalence of BF and the administration technique in hospital discharge, during the first month at home and at six months of life.

Table 3: Distribution of preterm infants according to type and technique of milk feeding at the time of hospital discharge, during the first month at home, and at six months of life. Southeast region, Brazil, 2014-2015.

Variables		N	%
Type of milk feeding in discharge	EBF	26	31.0
	BF	51	60.7
	Artificial feeding	7	8.3
Feeding technique in discharge	Breast only	13	15.5
	Breast + cup	38	45.2
	Breast + bottle	26	31.0
	Bottle/small bottle	7	8.3
Type of milk feeding during first month at home	EBF	26	31.0
	BF	48	57.1
	Artificial feeding	10	11.9
Feeding technique during first month at home	Breast+bottle/small bottle	47	56.0
	Breast only	22	26.2
	Bottle/small bottle	10	11.9
	Breast+cup	5	6.0
Type of milk feeding at six months of life[a]	Artificial feeding+ complementary feeding	25	32.5
	Artificial feeding	17	22.1
	BF+complementary feeding	16	20.8
	BF	11	14.3
	EBF	7	9.1
	Predominant breastfeeding	1	1.3
Feeding technique at six months of life[a]	Bottle/small bottle	40	51.9
	Breast+bottle	21	27.3
	Breast only	14	18.2
	Cup	2	2.6

EBF = Exclusive breastfeeding; BF = Breastfeeding; [a] n = 77

Data collection in the first month after discharge was performed with a mean of 11 (± 3.5) days and a median 10.5 days after discharge, ranging from six to 25 days. Among the 84 premature infants followed, seven did not attend the six-month follow-up appointment and were not located by telephone (loss<10%). In relation to the 77 infants located, the corrected age ranged from 3.2 to 5.6 months, mean of 4.6 (± 0.7) and median of 4.8 months.

Among the reasons for early weaning at home reported during the first month and at six months, the following stood out: milk had 'dried up' (39.1%), premature infants' difficulty in sucking/"did not want to clutch the breast" (34.8%), "little milk/insufficient milk" (21.7%) and the beginning of bottle-feeding (17.4%) with possible coexistence of several reasons for not breastfeeding.

Associations between EBF in discharge, during the first month at home and at six months of age, and maternal and neonatal variables are shown in Table 4.

Table 4: Distribution of preterm infants in EBF and non-EBF in discharge, during the first month at home and at six months of age according to maternal and neonatal variables and their respective p values in the statistical test. Southeast region, Brazil, 2014-2015.

Variables	**EBF in hospital discharge** (n=84)						**EBF during 1st month at home** (n=84)						**EBF at 6 months of age** (n=77)					
	Yes			**No**		**P value**	**Yes**			**No**		**P value**	**Yes**			**No**		**P value**
	N	**%**	**95% CI**	**N**	**%**		**N**	**%**	**95% CI**	**N**	**%**		**n**	**%**	**95% CI**	**n**	**%**	
Maternal age																		
<21 years	6	31.6	10.7-52.5	13	68.4	0.94[a]	5	26.3	6.5-46.1	14	73.7	0.61[a]	3	16.7	0.0-33.9	15	83.3	0.34[b]
≥21 years	20	30.8	19.5-42.0	45	69.2		21	32.3	20.9-43.7	44	67.7		4	6.8	0.4-13.2	55	93.2	
Maternal education																		
Primary school	7	28.0	10.4-45.6	18	72.0	0,34[b]	8	32.0	13.7-50.3	17	68.0	0.88[b]	2	8.3	0.0-19.4	22	91.7	0.86[b]
Secondary school	18	36.0	22.7-49.3	32	64.0		16	32.0	19.1-44.9	34	68.0		4	8.9	0.6-17.2	41	91.1	
Higher education	1	11.1	0.0-31.6	8	88.9		2	22.2	0.0-49.4	7	77.8		1	12.5	0.0-35.4	7	87.5	
Marital status																		
Single	8	20.5	7.8-33.2	31	79.5		9	23.1	9.9-36.3	30	76.9		3	8.8	0.0-18.4	31	91.2	
Married	15	53.6	35.1-72.0	13	46.4	0.007[b]	14	50.0	31.5-68.5	14	50.0	0.03[b]	2	7.4	0.0-17.3	25	92.6	0.34[b]
Consensual union	2	13.3	0.0-30.5	13	86.7		2	13.3	0.0-30.5	13	86.7		1	7.1	0.0-20.6	13	92.9	
Widow	1	50.0	0.0-100.0	1	50.0		1	50.0	0.0-100.0	1	50.0		1	50.0	0.0-100.0	1	50.0	
Family income																		
Ignored	3	42.9	6.2-79.5	4	57.1		4	57.1	20.5-93.8	3	42.9		3	50.0	10.0-90.0	3	50.0	
< 1 minimum wage	3	37.5	4.0-71.0	5	62.5	0.49[b]	3	37.5	4.0-71.0	5	62.5	0.27[b]	1	12.5	0.0-35.4	7	87.5	0.025[b]
1-2 minimum wages	12	24.5	12.4-36.5	37	75.5		12	24.5	12.4-36.5	37	75.5		3	6.7	0.0-14.0	42	93.3	
3-5 minimum wages	4	33.3	6.7-60.0	8	66.7		3	25.0	0.5-49.5	9	75.0		0	0.0	0.0-0.0	11	100	
>5 minimum wages	4	50.0	15.4-84.6	4	50.0		4	50.0	15.4-84.6	4	50.0		0	0.0	0.0-0.0	7	100	
Maternal occupation																		
Paid	9	50.0	26.9-73.1	9	50.0	0.02[b]	8	18.2	6.8-29.6	36	81.8	0.004[b]	2	5.3	0.0-12.4	36	94.7	0.32[b]
Housewife	16	48.5	31.4-65.5	17	51.5		17	51.5	34.5-68.6	16	48.5		5	15.6	3.0-28.2	27	84.4	
Student	1	14.3	0.0-40.2	6	85.7		1	14.3	0.0-40.2	6	85.7		0	0.0	0.0-0.0	7	100	
Prenatal visits[c]																		
≥6 consultations	2[c]	9.5	0.0-22.1	19[c]	90.5	0.02[b]	2*	9.5	0.0-22.1	19[c]	90.5	0.02[b]	3[c]	6.2	0.0-13.1	45[c]	93.8	1.00[b]
<6 consultations	19[c]	35.8	22.9-48.8	34[c]	64.2		19*	35.8	22.9-48.8	34[c]	64.2		1[c]	5.3	0.0-15.3	18[c]	94.7	
Prior breastfeeding history																		
Yes	10	30.3	14.6-46.0	23	69.7	0.91[a]	12	36.4	20.0-52.8	21	63.6	0.38[a]	3	10.0	0.0-20.7	27	90.0	1.00[b]
No or primiparous	16	31.4	18.6-44.1	35	68.6		14	27.5	15.2-39.7	37	72.5		4	8.5	0.5-16.5	43	91.5	
Type of current gestation																		
Single	18	35.3	22.2-48.4	33	64.7	0.14[b]	21	41.2	27.7-54.7	30	58.8	0.02[b]	7	14.9	4.7-25.1	40	85.1	0.11[b]
Double	8	32.0	13.7-50.3	17	68.0		5	20.0	4.3-35.7	20	80.0		0	0.0	0.0-0.0	22	100	
Triple	0	0.0	0.0-0.0	8	100		0	0.0	0.0-0.0	8	100		0	0.0	0.0-0.0	8	100	

Variables	EBF in hospital discharge (n=84)						EBF during 1st month at home (n=84)						EBF at 6 months of age (n=77)					
	Yes			No		P value	Yes			No		P value	Yes			No		P value
	N	%	95% CI	N	%		N	%	95% CI	N	%		n	%	95% CI	n	%	
Type of delivery																		
Cesarean	11	22.0	10.5-33.5	39	78.0	0.03[a]	16	32.0	19.1-44.9	34	68.0	0.82[a]	4	8.9	0.6-17.2	41	91.1	1.00[b]
Vaginal/forceps	15	44.1	27.4-60.8	19	55.9		10	29.4	14.1-44.7	24	70.6		3	9.4	0.0-19.5	29	90.6	
Skin-to-skin contact at birth																		
No or ignored	23	36.5	24.6-48.4	40	63.5	0.06[a]	23	36.5	24.6-48.4	40	63.5	0.06[a]	5	8.6	1.4-15.8	53	91.4	1.00[b]
Yes	3	14.3	0.0-29.3	18	85.7		3	14.3	0.0-29.3	18	85.7		2	10.5	0.0-24.3	17	89.5	
Gestational age																		
<32 weeks	1	5.3	0.0-15.3	18	94.7	0.01[b]	3	15.8	0.0-32.2	16	84.2	0.07[b]	2	11.8	0.0-27.1	15	88.2	0.33[b]
32-34 weeks 6 days	17	37.8	23.6-51.9	28	62.2		13	28.9	15.6-42.1	32	71.1		5	12.2	2.2-22.2	36	87.8	
≥35 weeks	8	40.0	18.5-61.5	12	60.0		10	50.0	28.1-71.9	10	50.0		0	0.0	0.0-0.0	19	100	
Birth weight																		
<1500g	3	11.5	0.0-23.8	23	88.5	0.02[b]	5	19.2	4.1-34.4	21	80.8	0.10[a]	2	8.0	0.0-18.6	23	92.0	0.65[b]
1500-2499g	18	38.3	24.4-52.2	29	61.7		15	31.9	18.6-45.2	32	68.1		5	12.2	2.2-22.2	36	87.8	
≥2500g	5	45.4	16.0-74.6	6	54.6		6	54.5	25.1-84.0	5	45.5		0	0.0	0.0-0.0	11	100	
Total hospitalization time																		
≤15 days	15	57.7	38.7-76.7	11	42.3	<0.001[b]	15	57.7	38.7-76.7	11	42.3	<0.001[b]	2	8.0	0.0-18.6	23	92.0	0.79[b]
16-29 days	9	32.1	14.8-49.4	19	67.9		7	25.0	9.0-41.0	21	75.0		3	12.0	0.0-25.7	21	84.0	
≥30 days	2	6.7	0.0-15.6	28	93.3		4	13.3	1.2-25.5	26	86.7		2	7.1	0.0-16.7	26	92.9	
Use of ventilatory support[d]																		
≤3 days	9	33.3	15.6-51.1	18	66.7	0.04[b]	9	33.3	15.6-51.1	18	66.7	0.16[b]	1	4.3	0.0-12.7	22	95.7	0.53[b]
4-6 days	4	40.0	9.6-70.4	6	60.0		4	40.0	9.6-70.4	6	60.0		1	10.0	0.0-28.6	9	90.0	
≥7 days	1	5.9	0.0-17.1	16	94.1		2	11.8	0.0-27.1	15	88.2		2	12.5	0.0-28.7	14	87.5	
Use of oxygen therapy[e]																		
≤2 days	7	46.7	21.4-71.9	8	53.3	0.34[b]	8	53.3	28.1-78.6	7	46.7	0.22[b]	3	21.4	0.0-42.9	11	78.6	1.00[b]
3-6 days	0	0	0.0-0.0	1	100		0	0	0.0-0.0	1	100		0	0.0	0.0-0.0	1	100	
≥7 days	0	0	0.0-0.0	3	100		0	0	0.0-0.0	3	100		0	0.0	0.0-0.0	3	100	

EBF = Exclusive breastfeeding; [a] Chi-square test; [b] Fisher's exact test; [c] Missing data; [d] n = 54 (5 losses at 6 months); [e] n = 19 (1 loss at 6 months).

DISCUSSION

Breast milk, preferably raw milk, should be the first choice for the first milk offer to premature infants because of its innumerable immunological properties. In this study, 97.6% of preterm infants received breast milk and/or milk from the HBM in their first milk feeding. These data are close to those of another study, in which 95.2% of premature infants received human milk, 85.7% of which was human milk from the HBM and 9.5% of maternal milk in the first milk intake[12].

Regarding the prevalence of breastfeeding in preterm infants in hospital discharge, 31.0% were in EBF, 60.7% in BF and 8.3% in artificial feeding. The comparison of these data with those of other studies demonstrates that EBF rates in premature infants are below those recommended by the WHO[14]. In a Danish national cohort, the EBF index in hospital discharge was higher and reached 68% of preterm infants, while 17% were in partial BF and 15% of non-breastfeeding[9].

In a study in Sweden, the country with the highest EBF rates, was observed a decrease in EBF in preterm infants in hospital discharge over a 10-year period, from 59% in 2004 to 45% in 2013, in addition to an increase in mixed breastfeeding, from 29% to 40%, and non-breastfeeding, from 12% to 15%. The largest decline in EBF occurred in extreme preterm infants, from 55% to 16%[6].

The prevalence of BF (exclusive or not) in the first weeks after discharge is close to data from other studies. On the 14th day after discharge from a Baby-Friendly hospital, 36.2% of premature infants were in EBF, 55.2% in BF and 8.6% in artificial feeding. After 28 days of discharge, 25% of hospitalized preterm infants were in EBF, 60.3% in BF, and 14.7% had weaned[10]. In a cohort study, only 13% of premature infants were in EBF at six months of age[11].

Another negative aspect was the increased use of the bottle that accounted for 39.3% in hospital discharge, and in the first month at home this figure almost doubled and reached 67.9%. Authors[11] indicate the bottle should not be introduced into neonatal units if the mother wishes to perform EBF. Hence the need to review what is related to bottle use, since the present study was conducted in Baby-Friendly hospitals, which include not offering bottles or artificial nipples among one of the steps for the successful BF. Thus, the question on to what extent the norms and routines of these accredited institutions are adapted to premature infants' needs.

In the present study, mothers of preterm infants reported as main reasons for early weaning the difficulties of sucking, insufficient or 'dried up' milk. Mothers of low birth weight preterm infants also related the difficulty in latching and sucking weakness for unsuccessful breastfeeding, and had the feeling of weak and insufficient milk[16]. In this sense, are necessary the support and active listening to the premature infant's family, technical guidelines for breastfeeding management in this population, and the continuity and follow-up of the breastfeeding process after hospital discharge[16].

Maternal age may be related to BF duration. A study found that the higher the maternal age, the higher the BF rate in preterm infants[8]. However, maternal educational level has controversial relationships with BF duration[8,10,17]. In this study, there was no direct relationship between maternal age and educational level, and the prevalence of EBF, but there was a possible association between family income and EBF at six months of life. A study reports the need to work intensively with mothers of lower socioeconomic level, as they may be within the risk statistics for early weaning[17].

Marital status and maternal occupation were associated with EBF at hospital discharge and during the first month at home. In another study, marital status was also associated with initiation of breastfeeding in late preterm infants[8]. Among mothers of preterm infants or not who worked outside the home, those on maternity leave had a lower chance of interrupting the EBF in the first four months of the infant's life[18].

Another contributing factor to EBF is the frequency of prenatal consultations. The present study revealed a significant association between EBF and the number of prenatal consultations. Most mothers who were exclusively breastfeeding their children in discharge and at home had attended less than six consultations. In contrast, an integrative review showed prenatal education as a significant factor in breastfeeding duration after hospital discharge of preterm infants from neonatal intensive care units[17]. Such divergences lead to questions about the quality of prenatal care in the preparation and encouragement of BF, in addition to the sample design, and future studies are needed to better elucidate these results.

The type of delivery was also associated with EBF in discharge, even though there was no association in another study[10]. The type of pregnancy, in turn, interfered in EBF in the first month after discharge, probably because of maternal difficulties in maintaining EBF of more than one child at home without constant support of the health team. There was lower prevalence of EBF in hospital discharge and shorter duration of EBF in mothers who gave birth to twins or triplets[9].

In addition, gestational age and birth weight are factors commonly associated with exclusive breastfeeding in preterm infants, which was confirmed in this study; babies born more prematurely or with lower weight were not in EBF in hospital discharge. Studies have indicated the association of lower gestational ages with late establishment of EBF[11], and gestational age at birth is a strong predictor for the onset and frequency of BF during the preterm infant's hospitalization[19].

Length of hospital stay also influenced the prevalence of EBF in hospital discharge and at home. The shorter the hospitalization period, the higher the EBF rate in this study. Admission to a neonatal intensive care unit itself poses a unique challenge for the premature infant's family but, on the other hand, additional hospitalization time can be used by the health team for greater preparation of parents for breastfeeding after discharge[17].

Among preterm infants who were in EBF in discharge, most used mechanical ventilation for three days or less. Studies also identified late initiation of breastfeeding[19] and establishment of EBF[11] among premature infants who needed ventilatory support. Respiratory instability is one of the relevant factors for initiation and maintenance of BF in premature infants.

Although early-skin-to-skin contact was not associated with EBF in the three moments collected, the Baby-Friendly Hospital Initiative adapted to neonatal units (Neo-BFHI) advocates its early, continuous and prolonged performance with positive effects on breastfeeding and development of the premature infant[20].

With all these challenges and difficulties encountered by mothers and premature infants for establishing and maintaining EBF, the nursing team has a key role in this process. Breastfeeding in premature infants is a complex process influenced by several maternal and neonatal factors, but also influenced by the clinical practices and care provided by the health team[11]. The lack of time and of staff knowledge about breastfeeding may affect the support given to mothers of preterm infants[6]. Therefore, nursing should be aware of the importance of

constantly searching for recent and updated evidence in order to instrumentalize its clinical practice for encouragement actions of premature infants' breastfeeding.

In addition, the strategies and policies currently in place for promotion, protection and support of BF have not been successful in changing the scenario of low rates of EBF in preterm infants. Based on this challenge, a group of Canadian and Nordic researchers expanded and adapted the Ten Steps to Successful BF for premature and critically ill infants admitted to neonatal units (Neo-BFHI) by considering the complex and highly technological context of exclusively breastfeeding this vulnerable population. These adaptations are based on BFHI standards and three guiding principles: team focus on responding to each mother's individual needs in their context; facilitating actions of the family-centered care approach; and continuity of care between the pre, peri, postnatal periods and after discharge[20].

Thus, some aspects unique to the norms and routines of the studied Baby-Friendly hospitals need to be reviewed, updated and improved by making imperative their adaptation to the peculiarity and reality of premature infants and critically ill babies. The Neo-BFHI is an excellent strategy to be implemented in neonatal units with the main purpose of overcoming the challenges of breastfeeding this vulnerable population by reducing barriers and advancing the EBF rates.

Thus, strategies for the support of EBF in premature infants need to be implemented from prenatal care to follow-up after hospital discharge in an integrated and interconnected manner. There must be some changes at other levels, too, namely: recognition and dissemination of the fundamental role of BF for society; fostering of positive social attitudes towards BF; integration of breastfeeding into political programs; regulation of the artificial milk industry; expansion and monitoring of interventions and trends in breastfeeding practice; and removal by institutional policies of structural and social barriers that prevent women from breastfeeding[4].

CONCLUSION

The study concluded that EBF rates in preterm infants of two Baby-Friendly hospitals located in the Southeast of Brazil in discharge, in the first month after discharge and at six months of life fall short of national and international recommendations. The results also reveal the possible association of some factors with the prevalence of EBF in preterm infants, such as marital status, maternal occupation, prenatal consultations, type of gestation and delivery, gestational age, birth weight, use of ventilatory support, time of hospitalization in neonatal units and family income. Therefore, health teams, especially nursing, must know these factors and be able to promote, support and protect the optimal feeding for these preterm infants.

A limitation of this study was the collection of breastfeeding practices after discharge and at six months of life based on the 24-hour maternal recollection, which may overestimate some indicators. In addition, the sample number of preterm infants was insufficient to perform more robust associations on factors influencing and determining EBF in this population. Recruiting only infants who were discharged within a three-month period may also limit outcomes, especially because of lower chances of including chronic premature infants who are hospitalized for long periods.

Despite these limitations, data presented contribute to the development and improvement of actions for the promotion, protection and support to BF in premature infants and for proposing interventions aimed at

improving this reality. Obviously, there must be greater training of health teams for intervention and adequate follow-up of this population segment by following the guidelines of Neo-BFHI, as well as socialization of knowledge and awareness on the importance of BF for mothers/family of premature infants.

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