







# Exclusive breastfeeding and the use of kangaroo slings among full-term infants between their first and second months of age

*Aleitamento materno exclusivo e uso da bolsa canguru em bebês a termo entre o primeiro e segundo mês de idade*

*Amamantamiento materno exclusivo y uso de la bolsa canguro en bebés a término entre el primer y segundo mes de edad*

Romilda Rayane Godoi Souza Braga<sup>1</sup>   
Júlia Carneiro Godoy de Sousa<sup>2</sup>   
Mariana Lamante Bueno<sup>2</sup>   
Karina Machado Siqueira<sup>2</sup>   
Ana Karina Marques Salge<sup>2</sup>   
Thaíla Corrêa Castral<sup>2</sup> 

<sup>1</sup>Secretaria de Saúde do Distrito Federal (SES-DF), Brazlândia, Distrito Federal, Brazil.

<sup>2</sup>Universidade Federal de Goiás (UFG), Goiânia, Goiás, Brazil.

## Corresponding author:

Thaíla Corrêa Castral

E-mail: [thailacastral@ufg.br](mailto:thailacastral@ufg.br)

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## ABSTRACT

**Objectives:** to verify the association between kangaroo slings used from maternity hospital to home, and exclusive breastfeeding among healthy full-term babies between the 1<sup>st</sup> and 2<sup>nd</sup> months of age; to identify breastfeeding self-efficacy level of those mothers using a kangaroo sling. **Method:** this cross-sectional study addressed mothers who received a kangaroo sling after giving birth, at maternity hospital, and were instructed to keep the babies in this posture at least one hour daily. The frequency with which the mothers used the kangaroo sling, breastfeeding self-efficacy, and the type of feeding were investigated between one and two months after delivery.  $\chi^2$  or Fisher's exact test and Cramer's V coefficient ( $p < 0.05$ ) were adopted in the analysis. **Results:** ninety-eight mothers participated in the study. All of them used the kangaroo sling in rooming-in; 39.8% used it three or more times a week at home between the 1<sup>st</sup> and 2<sup>nd</sup> months after giving birth; 70.4% of the babies remained on Exclusive Breastfeeding (EBF), the level of breastfeeding self-efficacy was high, and EBF was associated with the use of a kangaroo sling at home ( $p = 0.014$ ). **Conclusion:** healthy full-term babies can benefit from using a kangaroo sling, starting at the maternity hospital and extending its use to home.

**Descriptors:** Kangaroo-mother care method; Breast feeding; Infant, Newborn; Self efficacy.

## RESUMO

**Objetivo:** verificar a associação entre o uso da bolsa canguru, desde a maternidade até o domicílio, e aleitamento materno exclusivo, entre o 1o e 2o mês de idade, em bebês a termo saudáveis; identificar o nível de autoeficácia para o aleitamento materno, das mães que utilizaram a bolsa canguru. **Métodos:** estudo transversal com mães que receberam uma bolsa canguru após o parto, na maternidade, e foram orientadas sobre manterem seus bebês nesta postura, pelo menos uma hora por dia. Entre um e dois meses após o nascimento, foram investigadas a frequência do uso da bolsa canguru, autoeficácia materna da amamentação e tipo de alimentação dos bebês. Para análise foi empregado o teste  $\chi^2$  ou Exato de Fisher e o coeficiente V de Cramer ( $p < 0,05$ ). **Resultados:** participaram 98 mães. Todas utilizaram a bolsa canguru no alojamento conjunto, 39,8% utilizaram três ou mais vezes por semana, no domicílio entre o primeiro e segundo mês após o parto; 70,4% dos bebês permaneceram em Aleitamento Materno Exclusivo (AME), o nível da autoeficácia materna para amamentação foi alto. AME esteve associado ao uso da bolsa canguru no domicílio ( $p = 0,014$ ). **Conclusão:** bebês a termo saudáveis podem se beneficiar do uso da bolsa canguru desde a maternidade, estendido até o domicílio.

**Descritores:** Método canguru; Aleitamento materno, Recém-nascido; Autoeficácia.

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## RESUMEN

**Objetivo:** verificar la asociación entre el uso de la bolsa canguro, desde la maternidad hasta el domicilio, y amamantamiento materno exclusivo, entre el 1<sup>o</sup> e 2<sup>o</sup> mes de edad, en bebés a término saludables; identificar el nivel de autoeficacia para el amamantamiento materno, de las madres que utilizaron la bolsa canguro. **Métodos:** estudio transversal con madres que recibieron una bolsa canguro después del parto, en la maternidad, y fueron orientadas sobre mantener sus bebés en esta postura, por lo menos una hora por día. Entre uno y dos meses después del nacimiento, fueron investigadas la frecuencia del uso de la bolsa canguro, autoeficacia materna del amamantamiento y tipo de alimentación de los bebés. Para el análisis fue empleado el test  $\chi^2$  o Exacto de Fisher y el coeficiente V de Cramer ( $p < 0,05$ ). **Resultados:** participaron 98 madres. Todas utilizaron la bolsa canguro en alojamiento conjunto, 39,8% utilizaron tres o más veces por semana, en el domicilio entre el primero y segundo mes después el parto; 70,4%, de los bebés, permaneció en Lactancia Materno Exclusivo (LME); el nivel de la autoeficacia materna para amamantamiento fue alto. El LME estuvo asociado al uso de la bolsa canguro en el domicilio ( $p = 0,014$ ). **Conclusión:** bebés a término saludables pueden beneficiarse del uso de la bolsa canguro desde la maternidad, extendido hasta el domicilio.

**Descriptor:** Método Madre-Canguro; Lactancia Materna; Recién Nacido; Autoeficacia.

## INTRODUCTION

The contact between mother and infant benefits both physiologically and psychosocially, and early skin-to-skin contact immediately after birth is one of the most effective actions to promote Exclusive Breastfeeding (EBF)<sup>(1)</sup>. The benefits arising this contact include early initiation of breastfeeding and a successful first feeding<sup>(2)</sup>; efficient and effective sucking<sup>(2)</sup>; positive mother-child bonding as it reduces maternal feelings of guilt and fear<sup>(3)</sup>; and increased lactation duration and milk production<sup>(4)</sup>.

Mothers can maintain skin-to-skin contact after birth for prolonged periods during hospitalization and at home. Although early maternal contact is encouraged after birth, this practice is seldom investigated and encouraged among healthy full-term babies. Most studies addressing the relationship between prolonged maternal contact and breastfeeding focus on low-birth-weight infants in neonatal units<sup>(1)</sup>, which justifies by the fact that the Kangaroo Mother Care method is a Brazilian national public policy aimed at humanizing care to improve the care provided to low birth-weight infants<sup>(5)</sup>.

The multidisciplinary team assisting mothers in a rooming-in care arrangement is responsible for providing guidance and encouraging skin-to-skin contact during hospitalization and after discharge for as long as parents enjoy it<sup>(5)</sup>. Rooming-in care is a hospital practice that favors non-separation between mother and baby in the postpartum, encourages breastfeeding from birth up to hospital discharge, and favoring successful breastfeeding after discharge<sup>(6)</sup>. Highlight that, besides the mothers, fathers can provide kangaroo care to their children and benefit from this practice, increasing the attachment and bonding between parents and children<sup>(7)</sup>.

Given the importance of encouraging EBF and the early and prolonged contact between mothers and healthy full-term babies, and considered that Kangaroo sling can provide this contact, the objectives this study were to investigate the association between the use of kangaroo sling from maternity hospital to home and exclusive breastfeeding among healthy full-term babies between the 1<sup>st</sup> and 2<sup>nd</sup> months of age, and also to identify the level of breastfeeding self-efficacy of the mothers using the kangaroo sling.

## METHOD

This cross-sectional study was conducted in a public maternity hospital, entitled Baby-Friendly Hospital, in Goiânia, Goiás, Brazil. It included mothers living in the city or metropolitan region who underwent a vaginal birth and remained hospitalized with their babies in Rooming-in for at least 48 hours.

The mothers who gave birth to full-term babies (at 37 weeks of gestational age or more) experienced early skin-to-skin contact (within the first hour of the infant's life) and desired to use the kangaroo sling were recruited within 24 hours after delivery. The mothers whose babies had genetic or neurological abnormalities, neonatal asphyxia, or definitive or temporary contraindications to breastfeeding were excluded.

A pilot test was conducted in December 2015 with 18 mothers, and its results led to the decision not to include mothers who had a caesarean section in the study due skin-to-skin contact immediately after birth is less frequent among these mothers.

Data were collected between January and March 2016. There were 877 deliveries during this period; 496

did not meet the inclusion criteria, and 272 eligible mothers did not agree to participate in the study; thus, 109 mothers remained in the sample.

All participants received a kangaroo sling (made from three strips of cold mesh) donated by the Non-Governmental Organization (NGO) *Bebê Canguru* (<http://bebe-canguru.com/Novo/>). The kangaroo sling was delivered during hospitalization, 24 hours after birth at the latest. The mothers were instructed to use the kangaroo sling, with or without skin-to-skin contact, for at least one hour every day during their stay in the hospital. In related home, the mothers were recommended to use the kangaroo sling for at least one hour, three times a week, until the baby reached four months old. The four-month recommendation was based on the observation that many working mothers experienced time constraints after this period due to the typical length of maternity leave for those working under the contractual work regime. Resuming work interferes with the mothers' availability to participate in the intervention and may affect breastfeeding.

Additionally, the participants received an illustrated leaflet about how to use the kangaroo position, its benefits, how to adequately position the baby, indications and contraindications use, and guidance on the frequency and how long to use the kangaroo sling. In addition to the leaflet, the appropriate use of the kangaroo sling was demonstrated in practice. One of the researchers placed a baby directly on his/her mother, family member, or companion or simulated it with a doll.

The first time the mothers used the kangaroo sling during hospitalization was under the supervision of one of the researchers or a research assistant. After receiving the instructions, the participants answered a semi-structured questionnaire addressing sociodemographic data, information about the pregnancy, labor and delivery, and breastfeeding history.

Over a period of one to two months after discharge, one of the researchers or a research assistant contacted the mothers by telephone to ask about the frequency they were using the kangaroo sling, the type of breastfeeding adopted in the last 24 hours, and to apply the Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF) (8). Each telephone call lasted approximately ten minutes on average. Due to difficulties reaching some mothers via telephone, 38.7% of the telephone interviews were held between 61 and 81 days after birth.

## Study variables

### Type of breastfeeding

Breastfeeding was classified as exclusive when the baby received only breast milk, without offering water,

teas, or formula. Predominant breastfeeding was attributed when the baby received water or water-based drinks in addition to breast milk. Mixed breastfeeding was attributed when the baby received breast milk and other types of milk/formula. Non-breastfeeding was attributed when the breast milk was not included in the baby's diet. The type of breastfeeding was identified through a telephone interview, using a semi-structured questionnaire containing questions about how the baby was fed in the last 24 hours.

### Using the Kangaroo sling in rooming-in and at home

The use of the kangaroo sling was investigated via telephone, using also a semi-structured questionnaire containing questions about the weekly frequency of use between the baby's first and second months.

### Maternal self-efficacy for breastfeeding

Maternal self-efficacy for breastfeeding was assessed using the Breastfeeding Self-Efficacy Scale — Short Form (BSES-SF). This scale was translated and culturally adapted to Brazilian Portuguese and validated for pregnant<sup>(8)</sup> and postpartum women<sup>(9)</sup>. It is a self-reported form but can also be used in interviews.

It has 14 items divided into two domains:

- technical, with eight items, and
- intrapersonal domain, with six items.

The statements are rated on a Likert scale ranging from one to five. The total score ranges from 14 to 70 points and is classified as low effectiveness (14 to 32 points), moderate effectiveness (33 to 51 points), or high efficacy (52 to 70 points)<sup>(8,9)</sup>.

### Analysis procedure

Data were transferred to a database using the Statistical Package for Social Science — SPSS (version 23.0, 2015, IBM, USA). A descriptive analysis of the variables was performed and provided absolute frequency, mean, and standard deviation. The association between dichotomous variables was verified using the Chi-square or Fisher's Exact test ( $p$ -value < 0.05). Additionally, Cramer's V association coefficient was used to quantify the degree of association between the variables, using the following criteria: > 0.25 = very strong; > 0.15 = strong; > 0.10 = moderate; > 0.05 = weak; and > 0 = very weak<sup>(10)</sup>.

The study was approved by the Institutional Review Board (Certificate of Presentation for Ethical Consideration, in Portuguese, *Certificado de Apresentação de Apreciação Ética* – CAAE – number CAAE 49230615.0.0000.5078).

## RESULTS

Among the 109 mothers who initially agreed to participate, nine were removed due to the impossibility of contacting them, even after five attempts on different days and times. Additionally, two mothers could not complete the interview due to call interruptions, while resuming contact was impossible. Thus, the complete data from 98 mothers were analyzed.

Finally, BSES was applied to 88 mothers, because ten had already stopped breastfeeding, so their babies were receiving only formula.

The mothers were 23.7 years old on average (Standard Deviation — SD = 5.7), 20.0% were 18 or younger. Most lived in Goiânia (55.1%); 77.6% lived with the baby's father, and 41.8% were in a consensual union. Only 8 (8.2%) mothers had a bachelor's degree or some undergraduate studies; 55 (56.1%) did not have a paid job, and 49 (50.0%) reported a monthly family income of one to two times the minimum wage. Forty-eight mothers (49.0%) had other children, 11 of whom were two or younger. Regarding their partners, they were aged 27.3 on average (SD = 6.1); only two (2.0%) were 18 or younger; 89 (90.8%) had a paid job, and 13 (13.3%) reported having a bachelor's degree or some undergraduate studies.

Most babies were born male (52.0%); the mean gestational age was 39 weeks (SD = 1.1); the mean birth weight was equal to 3,224.3 grams (SD = 395.0); 14 (14.3%) had APGAR < 7 in the first minute; none had an APGAR score < 7 in the fifth minute of life.

Regarding pregnancy, labor, and delivery data, 70 (71.4%) mothers had six or more prenatal consultations; 69 (71.4%) were monitored in a Primary Health Care facility; 48 (49.0%) were primiparous; 46 (46.9%) of the multiparous women reported previous experience with breastfeeding, with 41 (41.8%) who exclusively breastfed (EBF) for 105.6 days on average (SD = 60.1). Only 11 (11.2%) mothers reported EBF up to the baby's sixth month. All mothers, except one, intended to breastfeed their current child, with a mean expectation of 14.3 months (SD = 8.6).

EBF between the baby's first and second month was reported by 70.4% (n = 69) of the mothers; predominant breastfeeding was reported by 12.2% (n = 12); mixed breastfeeding by 7.1% (n = 7); and 10.2% (n = 10) reported non-breastfeeding.

Regarding the frequency with which the mothers used the kangaroo sling (Table 1), all mothers reported using it at least once during their stay in the hospital rooming-in. At home, 87 (88.8%) used it at least once after leaving the hospital, and 39 (39.8%) of these used

**Table 1** - Frequency of the kangaroo sling at home by the mothers and family members, Goiânia, GO, Brazil, 2016

Kangaroo sling	f	%	
Frequency of use	≥ 3 times a week	39	39.8
	<3 times a week	48	49.0
	Nobody used it	11	11.2
Who used the sling with the baby?			
Mother	Yes	87	88.8
	No	11	11.2
Family member	Yes	28	28.6
	No	70	71.4
Father	Yes	19	19.4
	No	79	80.6

the sling three times or more per week. The duration of each session with the kangaroo sling ranged from 8 minutes to 4 hours (mean = 75min ± 66 min, median = 60 min). The remaining 11 (11.2%) mothers did not ever use the sling.

An association ( $p=0.014$ ) was found between EBF and the use of a kangaroo sling at home (Table 2). The degree of association between these variables was very strong ( $V = 0.265$ ;  $p = 0.009$ ).

Table 3 describes the Breastfeeding Self-Efficacy scores according to the perceptions of the mothers who breastfed their children between their first and second months of life. The breastfeeding self-efficacy score was high for all participants (Table 3) and was not associated with EBF during the study period ( $p = 0.103$ ) (non-tabulated data).

Table 4 shows the distribution of the participants' responses according to levels of agreement, enabling a better understanding of the domains and respective items with higher and lower self-efficacy perception.

## DISCUSSION

This is the first Brazilian study investigating and finding a significant association between EBF in the 1<sup>st</sup> and 2<sup>nd</sup> months of a child's life and contact (skin-to-skin or not) between mothers and their healthy full-term babies using a kangaroo sling at home.

This study can promote innovation in the care provided to healthy full-term babies, using a simple and low-cost strategy, i.e., kangaroo care initiated at birth and kept at home at least once a week between infants' first and second months of life.

Several factors may have contributed to the relationship between EBF and the mothers using kangaroo slings at home. The baby's proximity to the mother's

**Table 2** - Association between exclusive breastfeeding with the use and frequency of the kangaroo sling (n = 98), Goiânia, GO, Brazil, 2016

Variables	Exclusive breastfeeding				p-value
	Yes		No		
	f	%	f	%	
Did the mother use the kangaroo sling at home?					
Yes	65	66.3	22	22.5	0.014* <sup>†</sup>
No	4	4.1	7	7.1	
How often the sling was used at home?					
≥ 3 times a week	28	28.6	11	11.2	0.807 <sup>‡</sup>
< 3 times a week	41	41.8	18	18.4	

Note: \*p < 0.05, <sup>†</sup>Fisher Exact Test; <sup>‡</sup>χ<sup>2</sup> test.

**Table 3** - Breastfeeding Self-Efficacy Scale (BSES) scores, median, and quartiles according to the domain, Goiânia, GO, Brazil, 2016

Breastfeeding self-efficacy scores	n	%	Median	1 <sup>st</sup> Quartile	3 <sup>rd</sup> Quartile
High (52–70)	88	100	-	-	-
Mean (33–51)	0	0	-	-	-
Low (14–32)	0	0	-	-	-
Technical domain	-	-	39.0	36.2	40.0
Intrapersonal domain	-	-	29.0	28.0	30.0
Total score	-	-	68.0	64.2	69.0

breast makes breastfeeding more practical, favors the recognition of the baby’s wants, and improves parenting performance, which may benefit the maintenance of milk production<sup>(11)</sup>.

Most mothers used the kangaroo sling at least once at home, and 30.8% used it three or more times a week. The mothers’ main reasons for not using the sling include the need to improve their skills and knowledge about handling it, preoccupation with potential accidents, discomfort due to the heat, and the mothers’ and babies’ restlessness while using<sup>(12)</sup>.

The Brazilian population is not familiar with this practice among healthy babies. Even though the use of kangaroo slings has expanded in Western societies, there are still gaps concerning the proper understanding of this practice’s cultural and historical significance among Western communities<sup>(13)</sup>.

Highlight that a single cohort study in Italy examined the relationship between using a kangaroo sling and breastfeeding. The babies in the group that used the kangaroo sling (n = 69) for at least one hour a day in the first month presented a higher prevalence of EBF than the babies in the group that did not use the sling (n = 31), i.e., 72% versus 51% at the end of the two months; and 48% versus 24% at the end of five months, respectively. This finding suggests that using kangaroo slings among healthy babies during the first month is

associated with a longer duration of EBF<sup>(14)</sup>. Our study revealed a significant association between EBF and the kangaroo sling, even if used just once at home, between the first and second months of life.

The mothers who provided kangaroo care to their healthy full-term babies reported a stronger and more positive bond with them and also mentioned that their babies were calmer. Furthermore, using the kangaroo sling gave mothers greater autonomy, allowing them to perform tasks while keeping their arms free and their babies safe and comfortable. Furthermore, these babies had a higher prevalence of EBF in the first months of life<sup>(12)</sup>.

The prevalence of EBF in this study between the babies’ first and second months was 70.4%, higher than that found in the last Brazilian survey on breastfeeding, in which the probability of EBF at 30 and 60 days was 60.7 and 47.3%, respectively<sup>(15)</sup>. The prevalence of EBF was also higher than the results reported in the 2019 National Survey of Food and Child Nutrition (Portuguese acronym: ENANI), with an EBF prevalence of 59.7% at four months of life; though, the survey did not collect data from the first and second months of life<sup>(16)</sup>.

Note that this study exclusively considered mothers who had a vaginal birth and experienced early skin-to-skin contact with their babies, which may have in-



**Table 4** - Distribution of response frequencies according to the level of agreement and domain of the Breastfeeding Self-Efficacy Scale (BSES), Goiânia, GO, Brazil, 2016

Technical domain	Level of Agreement									
	Totally agree		Agree		Sometimes		Disagree		Totally disagree	
Item	n	%	n	%	n	%	n	%	n	%
1. Determine that my baby is getting enough breast milk.	58	65.9	15	17.0	13	14.8	2	2.3	0	0
3. Breastfeed my baby without using formula as a supplement	77	87.5	4	4.5	5	5.7	2	2.3	0	0
4. Ensure that my baby is properly latched for the whole feeding.	85	96.6	3	3.4	0	0	0	0	0	0
6. Manage to breastfeed even if my baby is crying	76	86.4	7	8.0	5	5.7	0	0	0	0
11. Finish feeding my baby on one breast before switching to the other breast	80	90.9	4	4.5	3	3.4	0	0	1	1.1
12. Continue to breastfeed my baby for every feeding	87	98.9	1	1.1	0	0	0	0	0	0
13. Manage to keep up with my baby's breastfeeding demands (I organize my bathing, sleeping, and eating demands with my baby's breastfeeding).	68	77.3	11	12.5	6	6.8	0	0	3	3.4
14. Tell when my baby is finished breastfeeding	69	78.4	10	11.4	8	9.1	0	0	1	1.1
Intrapersonal Thoughts Domain	Totally agree		Agree		Sometimes		Disagree		Totally disagree	
Item	n	%	n	%	n	%	n	%	n	%
2. Successfully cope with breastfeeding like I have with other challenging tasks. (Successfully overcome breastfeeding and other life situations).	67	76.1	16	18.2	5	5.7	0	0	0	0
5. Manage the breastfeeding situation to my satisfaction.	80	90.9	6	6.8	1	1.1	1	1.1	0	0
7. Keep wanting to breastfeed.	72	81.8	11	12.5	3	3.4	1	1.1	1	1.1
8. Comfortably breastfeed with my family members present.	69	78.4	9	10.2	4	4.5	4	4.5	2	2.3
9. Be satisfied with my breastfeeding experience.	82	93.2	5	5.7	1	1.1	0	0	0	0
10. Deal with the fact that breastfeeding is time consuming. (I want to breastfeed despite it being time consuming)	77	87.5	9	10.2	1	1.1	0	0	1	1.1

fluenced the maintenance of Exclusive Breastfeeding (EBF) after discharge<sup>(1)</sup>.

Regarding breastfeeding self-efficacy, all the mothers interviewed scored high, showing that they are confident in their ability to breastfeed, both in the practical technical domain and the psychological and personal domain.

No association was found between breastfeeding self-efficacy and breastfeeding in the study period, indicating that it was not considered a confounding variable.

The BSES allows for identifying areas in which a mother has more or less difficulty breastfeeding regarding technical or intrapersonal aspects, enabling profes-

sionals to work on a specific aspect to promote EBF and decrease early weaning, mainly when problems are identified early<sup>(17)</sup>.

The need for providing more comprehensive guidance to mothers on recognizing their babies' signs of hunger and satiety became apparent. Such a need is evidenced by the lowest score obtained on the scale's alternative "I completely agree" to item 1 in the technical domain: "Determine when my baby is getting enough milk" (65.9%).

A similar result was found in a study conducted in Ceará, Brazil, which assessed the breastfeeding self-efficacy of postpartum women in rooming-in accommodation. The authors of the previous study suggest that such a finding may be related to the mothers not trusting they have sufficient or good-quality breast milk<sup>(18)</sup>.

Such results confirm the importance of explaining to the mothers that there is no such thing as "weak milk." Breast milk may appear "thin" at the beginning of the feeding, but it contains the necessary nutrients. Additionally, the volume of milk produced can vary, as it is influenced by the duration and frequency at which a baby is breastfed; hence, there is a need to breastfeed exclusively and on free demand. The more times a baby breastfeeds, the more milk she/he sucks, and the greater the milk production<sup>(19)</sup>.

Continuing with the analysis of the technical domain, the items with the highest frequency of "disagree and totally disagree" were 13 Manage to keep up with my baby's breastfeeding demands) and 3 Breastfeed my baby without using formula as a supplement), respectively.

The answers suggest that some mothers are unable to conciliate their needs to the baby's needs due to the overload of tasks in the postpartum period and a lack of a support network or because they resume working early when the baby should still be exclusively breastfed.

The maternal experience of breastfeeding is subjective and based on the mothers' social experiences comprising their support network, considering not only the paternal figure but also their families and social network<sup>(20)</sup>.

As for resuming work early, it is important to remember that maternity leave in Brazil is only four months in private companies and six months in public organizations or organizations adept at the corporate citizenship program. Studies show that the length of maternal leave influences breastfeeding<sup>(21)</sup>.

Hence, efforts to extend the duration of maternity leave are still needed. The policies concerning paid maternity leave represent a strategy to prevent infant mor-

tality in low- and middle-income countries such as Brazil. Note that two years after paid maternity leave was adopted, the neonatal mortality rate decreased by 5.2%, the infant mortality rate decreased by 2.4%, and 1.9% among those under 5<sup>(22)</sup>.

The participant mothers who adopted mixed breastfeeding represented 12.2% of the sample. Thus, mothers should be encouraged to adopt exclusive breastfeeding during the baby's first six months of life (i.e., not offering water, tea, or any other drink or food) and continue breastfeeding until age two to complement a healthy diet. Early introduction of formula or complementary foods may predispose babies to allergies, episodes of diarrhea, and hospitalization due to respiratory diseases, malnutrition, and shorter breastfeeding duration, among others<sup>(23)</sup>.

The scale's items with the highest proportion of "I completely agree and agree" were 12 Continue to breastfeed my baby for every feeding), 4 Ensure that my baby is properly latched on for the whole feeding), and 11 Finish feeding my baby on one breast before switching to the other). This result suggests that mothers understand the information about correct latch-on and the importance of alternating breasts during breastfeeding. Hence, professionals are supposed to provide instructions during prenatal and postpartum care, especially in Baby-Friendly Hospitals<sup>(24)</sup>.

The scale's Intrapersonal Thoughts domain addresses the mothers' satisfaction and desire to breastfeed, the ability to breastfeed in public and to conciliate breastfeeding with other tasks, and factors related to interaction and maternal subjectivity, which reflects the mother's perceptions, attitudes, and beliefs regarding breastfeeding<sup>(8)</sup>. The analysis of the items in the intrapersonal domain shows that the answers with the highest percentage of "disagree and strongly disagree" are items 8 (Comfortably breastfeed with my family members present) and 7 (Keep wanting to breastfeed).

In general, some women may feel embarrassed when breastfeeding in public, whether in front of a family member or others. The mothers breastfeeding in public may face adverse reactions in places considered inappropriate<sup>(25)</sup>. Regarding expressing milk and breastfeeding in the workplace, a study collected the reports of working nursing mothers that indicate adverse factors such as the lack of support from managers and co-workers and the absence of a suitable area for them to express milk<sup>(26)</sup>.

Only two mothers disagreed or totally disagreed with item 7, which addresses the desire of mothers to continue breastfeeding, whilst 81.8% chose the option "totally agree."

The mothers' intention to breastfeed is a behavior formed throughout life and precedes breastfeeding. Associate factors vary and include lifestyle habits, knowledge, biological characteristics in general, besides those related to pregnancy, breastfeeding, and healthcare, and as well as ethnic, socioeconomic, demographic, and family factors<sup>(27)</sup>. Health professionals working with breastfeeding women should encourage breastfeeding, but also respect their time, rhythm, and desire<sup>(28)</sup>.

The items with the highest proportion of "I completely agree and agree" responses were 9 (Be satisfied with my breastfeeding experience), 5 (Manage the breastfeeding situation to my satisfaction), and 10 (Deal with the fact that breastfeeding is time consuming).

The high levels of agreement on items 9 and 5 indicate the mothers' satisfaction with breastfeeding. On the other hand, the item 10 has a high level of agreement, indicating that most mothers understand that breastfeeding is time-consuming. This perception may also influence the mothers' willingness to continue breastfeeding. The duration and frequency a baby requires to breastfeed varies, especially when breastfed on demand<sup>(19)</sup>.

This study produced relevant information; however, there are limitations, such as its cross-sectional design, which prevents the establishment of a cause-and-effect relationship between the use of the kangaroo sling and EBF. Other limitations include the convenience sample, the absence of a control group, and the fact that part of the interviews were held 60 days and, in some cases, 81 days after delivery. Such delay may have led to memory bias regarding the weekly frequency of the Kangaroo sling and dates when different types of breastfeeding were adopted. Nevertheless, we should remember that ceasing exclusive breastfeeding is a relevant event in the lives of postpartum women; hence, emotional factors contribute to the mothers' recalling the exact date.

## CONCLUSION

The results of this study show an association between EBF and the use of a kangaroo sling at home (at least once after discharge), suggesting that healthy full-term babies can benefit from using a kangaroo sling. Such evidence is expected to support guidance on the use of kangaroo slings after birth, at the hospital, and home as a strategy to encourage EBF and decrease infant morbidity and mortality.

The prevalence of EBF among the participant women, who had a vaginal birth, gave birth to full-term babies, and used a kangaroo sling at least once a week at home, was 70.4% between the 1<sup>st</sup> and 2<sup>nd</sup> months after delivery. Additionally, their perception of breastfeeding self-efficacy was high.

Although a small percentage of fathers and other family members used the kangaroo sling, it is a practice to be encouraged to increase the mothers' support network and strengthen the role of fathers in the care provided to babies.

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## CONFLICT OF INTERESTS

None

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## AUTHORS' CONTRIBUTIONS - CRediT

**RRGSB:** conception; data curation; investigation; methodology; project administration; resources; writing – original draft, writing – review and editing.

**JCGS:** investigation; writing – review and editing.

**MLB:** investigation; writing – review and editing.

**KMS:** methodology; writing – review and editing.

**AKMS:** methodology; writing – review and editing.

**TCC:** conception; data curation; investigation; methodology; project administration; resources; supervision; writing – original draft, writing – review and editing.

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