

Impact of the second and third stages of the kangaroo method: from birth to sixth month

Impacto da segunda e terceira etapas do método canguru: do nascimento ao sexto mês

Impacto de la segunda y tercera etapas del método canguro: del nacimiento al sexto mes

ABSTRACT

Purpose: To evaluate whether the Kangaroo Method would have an impact on the rates of exclusive breastfeeding, weight, length of hospital stay and rates of hospital readmission. **Methods:** This is a retrospective cohort, which included very-low-weight preterm newborns. These were divided into two groups: CCG - composed of those assisted in the Conventional Neonatal Intermediate Care Unit; KCG - composed of those who were assisted at the Kangaroo Neonatal Intermediate Care Unit. **Results:** The KCG group showed better results in exclusive breastfeeding rates at the time of hospital discharge and during outpatient follow-up - first outpatient consultation corrected fourth month of gestational age, in addition to lower rates of readmission. **Conclusion:** The second and third stages of the Kangaroo Method favored the practice and maintenance of exclusive breastfeeding, in addition to presenting lower rates of readmission until the sixth month of corrected gestational age

Descriptors: Kangaroo-Mother Care Method; Infant, Premature; Public health policies; Nursing.

RESUMO

Objetivos: Avaliar se o Método Canguru tem impacto nas taxas de aleitamento materno exclusivo, peso, tempo de internação e taxas de reinternação. **Método:** Trata-se de uma coorte retrospectiva, que incluiu recém-nascidos pré-termo de muito baixo peso ao nascer, os quais foram divididos em dois grupos: GCCo – composto por aqueles assistidos na Unidade de Cuidados Intermediários Neonatal Convencionais; GCCa – composto por aqueles que foram assistidos na Unidade de Cuidados Intermediários Neonatal Canguru. **Resultados:** O grupo GCCa apresentou resultados superiores nas taxas de aleitamento materno exclusivo, no momento da alta hospitalar, primeira consulta ambulatorial, quarto mês de idade gestacional corrigida, além de menores taxas de reinternação. **Conclusão:** As segunda e terceira etapas do Método Canguru favoreceram a prática e manutenção do aleitamento materno exclusivo, além de apresentarem menores taxas de reinternação até o sexto mês de idade gestacional corrigida.

Descritores: Método Canguru; Prematuridade; Políticas públicas de saúde; Enfermagem.

RESUMEN


Objetivos: Evaluar si el Método Canguro tendría un impacto en las tasas de lactancia materna exclusiva, peso, tiempo de estancia hospitalaria y tasas de reingreso. **Método:** Se trata de un grupo retrospectivo, que incluyó a recién nacidos prematuros de muy bajo peso al nacer. Estos se dividieron en dos grupos: GCCo - compuesto por los atendidos en la Unidad de Cuidados Intermedios Neonatales Convencionales; GCCa - compuesto por los que fueron atendidos en la Unidad de Cuidados Intermedios Neonatales Canguro. **Resultados:** El grupo GCCa mostró resultados superiores en las tasas de lactancia materna exclusiva al momento del alta hospitalaria y durante el seguimiento ambulatorio - primera consulta ambulatoria en el cuarto mes de edad gestacional corregida, además de menores tasas de reingreso. **Conclusión:** La segunda y tercera etapa del Método Canguro favoreció la práctica y la prolongación de la lactancia materna exclusiva, además de presentar menores tasas de reingreso hasta el sexto mes de edad gestacional corregida.

Descritores: Método Madre-Canguro; Prematuro; Políticas Públicas de Salud, Enfermería.


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INTRODUCTION

Prematurity is still a challenge for perinatal care worldwide. Technological advances and better management in the care of pregnancy and the newborn have provided an increase in the survival of preterm and very low birth weight infants (VLBW). However, VLBW are more predisposed, in relation to those born at term, to diseases such as necrotizing enterocolitis, bronchopulmonary dysplasia and late sepsis⁽¹⁾. In addition, factors such as prolonged hospital stay and numerous invasive procedures can cause several unfavorable clinical outcomes, and the consequences often go beyond the perinatal period⁽²⁾. Early weaning, difficulty in somatic growth and higher rates of readmission are among the main challenges encountered after hospital discharge⁽³⁾.

Soon, there is an increasing incentive to practice measures in order to mitigate the harmful and often iatrogenic effects caused by the hospital environment and invasive procedures necessary to maintain the life of the sick newborn. Thus, the focus of neonatal care goes through an important paradigm shift, whose objective is no longer just survival, but also the challenge of providing care centered on the best development of the VLBW, capable of returning a suitable child to the family and society, to fully perform their physical, affective and intellectual capacities.

In this context, the Kangaroo Method (KM) was launched in Brazil as a public health policy, the main objective of which is to develop actions that favor family-centered care, the reduction of stress factors to the VLBW, the increase in breastfeeding and the mother-child-family bond⁽⁴⁾. The KM is divided into three stages, the first of which is carried out within the Neonatal Intensive Care Units (NICU), with an emphasis on the environment and welcoming the family, encouraging the formation of bonds through touch and progressively with the kangaroo positioning, in addition to protective measures for newborns, regarding stress and pain. The second stage, on the other hand, involves the continuous monitoring of the mother with her child, in the Kangaroo Neonatal Intermediate Care Units (KNICU), in which skin-to-skin contact is also performed through the kangaroo position, in addition to intensifying the establishment of breastfeeding and newborn care routines. The third stage occurs after hospital discharge and consists of outpatient follow-up until the VLBW reaches 2500g and

follow-up conditions in the follow-up outpatient clinics⁽⁴⁾.

Those VLBW whose mothers have no possibility and / or interest in accompanying them continuously, in the second stage of the KM, continue in the Conventional Neonatal Intermediate Care Units (CNICU), receiving all the care offered, in the first stage of the KM, but without the presence maternally, which consequently leads to a reduction in the frequency of breastfeeding directly in the breast, in addition to lower skills in caring for the newborn. After hospital discharge, they will be followed up in follow-up clinics and / or in the primary care networks of the family health strategy⁽⁴⁾.

The KM refers to a Brazilian public health policy, which encompasses several pillars, among them, the kangaroo positioning or skin-to-skin contact. Despite the benefits already proven in studies carried out, mainly in the international context, such as favoring breastfeeding⁽⁵⁾, weight gain⁽⁶⁾, reduction in length of hospital stay⁽⁷⁾ and lower risk of death⁽⁸⁾, the kangaroo positioning is just a foundation within a much more comprehensive strategy. It is then questioned whether the KM would be able to provide other benefits as well, as it encompasses a plurality of actions and guidelines that aim to provide comprehensive and humanized assistance to the VLBW and their family. Thus, the objective of this study was to assess whether the second and third stages of KM would have an impact on neonatal clinical variables, specifically on exclusive breastfeeding (EBF) rates, weight gain, length of hospital stay and readmission rates, from birth to the sixth month of gestational age corrected (CGA).

METHODS

The research was carried out in the neonatology service of a university hospital in Minas Gerais - Brazil, specifically in the neonatal unit. This unit has 41 beds, of which 15 are for the NICU, 26 for the CNICU and six for the KNICU. KNICU, implemented in June 2016, receives graduates from the NICU and CNICU, according to the eligibility criteria, defined by the Technical Manual of the Ministry of Health⁽²⁾. These criteria are divided: criteria related to the newborn (NB), which are clinical stability, full enteral nutrition and minimum weight of 1,250 grams and criteria related to the mother, which is a desire to participate, availability of time and social support network, consensus between mother, family and

health professionals, ability to recognize the signs of stress and risk situations of the NB and knowledge and ability to manage the VLBW in a kangaroo position. This was a retrospective cohort study. Data were obtained through medical record analysis, which evaluated the length of hospital stay, breastfeeding rates, weight at hospital discharge, exclusive post-discharge breastfeeding time (first outpatient consultation, fourth and sixth month of CGA) and readmission rates up to the sixth month of CGA.

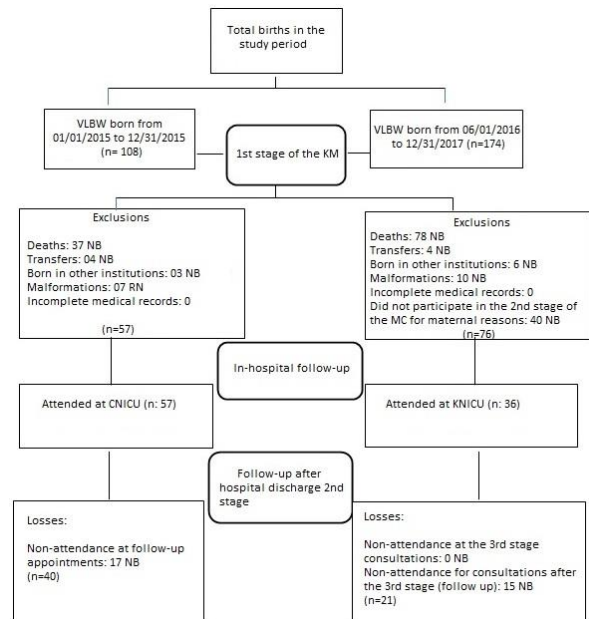
The research was submitted to the Research Ethics Committee and, due to the retrospective study design, the Free and Informed Consent Term was waived, the authors being responsible for the confidentiality of the information and non-identification of the participants (approval number: 2521553).

The study included VLBW (<1500 g) of any gestational age and excluded those who died, required transfer to other institutions, had congenital malformations or symptomatic neurological changes that prevented or disadvantaged the performance of the kangaroo position and breastfeeding. (<1500 g) of any gestational age and excluded those who died, required transfer to other institutions, had congenital malformations or symptomatic neurological changes that prevented or disadvantaged the performance of the kangaroo position and breastfeeding.

The included VLBW were divided into two groups: Conventional Care Group (CCG) - composed of VLBW who were born between January 1 and December 31, 2015, with eligibility criteria for KNICU, but who remained at CNICU, because in that period period KNICU was not yet in operation; Kangaroo Care Group (KCG), composed of VLBW, assisted at KNICU, who were born in the period from June 1, 2016 to December 31, 2017.

Considering the annual average of births of VLBW, in the two years of evaluation of this study in the institution and a confidence level of 95%, it was established, after sample calculation, that the sample would be composed of, at least, 63 medical records. However, as this was a retrospective study, in which there is a possibility of loss of information, it was decided to evaluate all the records of the VLBW with eligibility criteria, in the pre-established period, totaling 93 children included.

Figure 1 - Flowchart of inclusions and exclusions.



Source: Elaborated by the authors (2021).

Legend: VLBW: very low birth weight preterm newborn, NB: newborn, KM: Kangaroo Method, CNICU: Conventional Neonatal Intermediate Care Unit, KNICU: Kangaroo Neonatal Intermediate Care Unit.

The VLBW included, in both groups, were evaluated for variables related to childbirth (Apgar score of 5 minutes, birth weight, gestational age at birth), variables related to hospitalization (time on mechanical ventilation, total time on oxygen therapy, time of parenteral nutrition, day of onset of enteral route, day of full enteral route, lower weight, day of onset of breastfeeding, length of hospital stay, weight of discharge, type of feeding at the time of discharge) and variables of outpatient follow-up (type of feeding in the first consultation, 4th and 6th month of CGA, weight in the 4th and 6th month of CGA, readmission rates up to the 6th month of CGA). We emphasize that the first outpatient consultation referred to the consultation carried out in the follow-up outpatient clinic (common to all VLBW born in the study institution, both for VLBW who were discharged from the third stage of the KM, and for those who remained only in the CNICU).

Quantitative variables were described as means, medians, standard deviations and maximum and minimum values. In addition, the Shapiro-Wilk normality test was applied. For variables that showed a normal distribution, the t-Student was applied to compare the groups, otherwise, the Mann-Whitney test was applied. Qualitative variables were described in frequency and percentage. Associations of qualitative variables were assessed using the likelihood ratio

test. To assess the outcomes, logistic and logistic regression adjusted for discharge weight and CGA was used. All tests were applied considering a significance level of 5% ($p < 0.05$). The procedures were performed using the SPSS v.20 software.

RESULTS

A total of 93 medical records were evaluated, 57 belonging to the CCG and 36 belonging to the KCG. Table 1 shows the main clinical characteristics of the VLBW included in the study.

Table 1 - Characterization of the sample regarding the numerical variables of the VLBW and mothers included in the study

Variables	CCG	KCG	p-value
Maternal age (years) †	25,82±6,85	25,92±5,71	0,94
Gestational age (weeks)†	28,98±2,17	28,86±2,10	0,79
Birth weight †	1082,79±238,48	1069,67±226,56	0,79
Apgar 5th minute *	8,0 (4,0-10,0)	9,0 (6,0-10,0)	0,19
Mechanical ventilation time (days) *	1,0 (0,0-28,0)	1,50 (0,0-50,0)	0,48
Total oxygen therapy time (days) *	20,0 (1,0-95,0)	24,0 (0,0-50,0)	0,83
Parenteral nutrition time (days) *	13,0 (1,0-37,0)	14,50 (0,0-52,0)	0,50
Day of onset of enteral route (days) *	2,0 (1,0-11,0)	2,0 (1,0-30,0)	0,13
Full enteral day (days) *	18,0 (7,0-40,0)	16,0 (5,0-56,0)	0,55
Lowest weight (grams) †	909,68±229,06	907,36±233,91	0,96
Breastfeeding start day (days) †	28,48±18,80	23,47±12,67	0,12
Duration of initial hospital stay (days) †	66,30±21,43	61,06±18,39	0,30
CGA at hospital discharge (weeks) †	38,14±2,55	37,83±1,95	0,53
High Weight *	2120,0 (1915,0-3510,0)	2027,5 (1820,0-2730,0)	0,00
Weight in the Fourth Month of CGA†	5959,75±1079,19	5573,15±803,29	0,11
Weight in the Sixth Month of CGA*	6980,0 (4400,0-10790,0)	6445,0 (5130,0-9070,0)	0,12

Source: Elaborated by the authors (2021).

Legend CGA: corrected gestational age, *: values expressed as median (minimum-maximum), †: values expressed as mean ±standard deviation.

EBF rates were higher at discharge, in the first outpatient follow-up visit and in the fourth month of CGA in the KCG group and the readmission rates were higher in the CCG group. In

addition, there was a lower number of return visits in the first outpatient follow-up visit in the KCG group, after discharge from the third stage (Table 2).

Table 2 - Clinical characteristics at hospital discharge and during outpatient follow-up of the VLBW included in the study

Variables	Moments	Occurrence	n (CCG)	Percentage (CCG)	n (KCG)	Percentage (KCG)	p-value
EBF	High	Yes	1	1,8	6	16,7	0,00
		No	56	98,2	30	83,3	
	First consultation	Yes	1	1,9	5	21,7	0,00
		No	52	98,1	18	78,3	
	Fourth month of CGA	Yes	0	0,0	7	25,9	0,00
		No	40	100	20	74,1	
Sixth month of CGA	Yes	0	0,0	2	9,5	0,36	
	No	40	100	19	90,5		
MB	High	Yes	28	49,1	26	72,2	0,026
		No	29	50,9	10	27,8	
	First consultation	Yes	26	49,1	11	47,8	0,921
		No	27	50,9	12	52,2	
	Fourth month of CGA	Yes	9	22,5	7	25,9	0,748
		No	31	77,5	20	74,1	
Sixth month of CGA	Yes	4	10,0	5	23,8	0,159	
	No	36	90,0	16	76,2		

(Continue)

Table 2 - Clinical characteristics at hospital discharge and during outpatient follow-up of the VLBW included in the study

Variables	Moments	Occurrence	n (CCG)	Percentage (CCG)	n (KCG)	Percentage (KCG)	p-value
Dairy formula-only diet	High	Yes	28	48,1	4	11,1	0,000
		No	29	50,9	32	88,9	
	First consultation	Yes	25	47,2	8	34,8	0,314
		No	28	52,8	15	65,2	
	Fourth month of CGA	Yes	31	77,5	13	50,0	0,021
		No	9	22,5	13	50,0	
Sixth month of CGA	Yes	36	90,0	14	70,0	0,057	
	No	4	10,0	6	30,0		
Readmission	First consultation	Yes	6	11,3	0	0,0	0,033
		No	47	88,7	23	100,0	
	Fourth month of CGA	Yes	6	15,0	6	22,2	0,453
		No	34	85,0	21	77,8	
	Sixth month of CGA	Yes	4	10,0	1	4,8	0,460
		No	36	90,0	20	95,2	
Attendance to consultations	First consultation	Yes	53	93,0	23	63,9	0,000
		No	4	7,0	13	33,1	
	Fourth month of CGA	Yes	40	70,2	27	75,0	0,612
		No	17	29,8	9	25,0	
	Sixth month of CGA	Yes	40	70,2	21	58,3	0,244
		No	17	29,8	15	41,7	

Source: Elaborated by the authors (2021).

Legend CGA: corrected gestational age, EBF: exclusive breastfeeding, MB: mixed breastfeeding.

Table 3 shows, by means of logistic regression, that the second and third stages of the KM increased by 11.2 times the chance of the

VLBW being in EBF at the time of discharge and, in 14.4 times of remaining in EBF in the first outpatient follow-up visit.

Table 3 - Logistic regression analysis regarding the probability of feeding, through exclusive breastfeeding, after being assisted by the Kangaroo Method at different times

Moments	OR No adjustment	p-value	OR adjusted *	p-value
High	11,2	0,03	17,3	0,02
First consultation	14,4	0,02	7,3	0,09
Fourth month of CGA	1,0	0,99	1,0	0,99
Sixth month of CGA	1,0	0,99	1,0	0,99

Source: Elaborated by the authors (2021).

Legend CGA: corrected gestational age, OR: Odds Ratio; *: Odds Ratio adjusted for high birth weight and high gestational age.

DISCUSSION

VLBWs who spent a period of hospitalization at KNICU showed higher rates of EBF at hospital discharge, at the first outpatient follow-up visit and in the fourth month of CGA, when compared to those who remained at CNICU. Being assisted by the second and third stages of the KM increased by 11.2 times ($p = 0.02$) the probability of being on EBF at the time of hospital discharge and 14.4 times ($p = 0.01$) of remaining on EBF on first outpatient follow-up visit. Previous studies carried out in Brazil, evaluating the KM, also observed an increase in breastfeeding rates⁽⁹⁾. Similar results were observed in a systematic review with meta-analysis that, despite analyzing only the kangaroo position, suggested that skin-to-skin contact

increases the likelihood of EBF by 50% at hospital discharge⁽¹⁰⁾.

We also observed a lower weight associated with the KCG group at the time of hospital discharge. However, in the fourth and sixth months of CGA, both groups showed similar results. Although lower weight averages are related to the KCG group, these values still remained high, since the technical manual of the Ministry of Health suggests that, for hospital discharge, the minimum weight is 1600g and, for discharge from the third stage, minimum weight of 2500g⁽⁴⁾.

In a study that evaluated the neonatal results of KM in Brazil, comparing 16 units that did or did not have the second and third stages of the method, 958 preterm infants were included, with birth weight from 500 g to 1,749 g. It was observed that weight ($p = 0.012$), length ($p = 0.039$) and head

circumference ($p = 0.006$), with 36 weeks of corrected gestational age, were lower in kangaroo units, despite showing an increase in breastfeeding rates⁽¹¹⁾. Previous studies that evaluated preterm newborns found favorable results for KM related to weight gain⁽¹⁰⁾ and the percentage of weight gain speed in the third stage, when compared to the first and second stages of the method⁽¹²⁾.

We did not observe any difference in the average length of stay, nor in CGA, at the time of hospital discharge. These variables, together with the weight averages at the time of discharge, reinforce the difficulty and insecurity on the part of the health teams for hospital discharge of these VLBW. This data is worrying, since the longer the hospital stay, the higher the weaning rates⁽¹³⁻¹⁴⁾, complications such as late sepsis⁽¹⁵⁾, in addition to high hospital costs⁽¹⁶⁾. Different from what was observed in our results, international studies that evaluated the kangaroo position found an association between shorter hospital stay and skin-to-skin contact⁽¹⁷⁻¹⁸⁾.

Higher rates of readmission were found in the CCG group, in the period corresponding to post-discharge and in the first outpatient follow-up visit. Few Brazilian studies have addressed this issue. Systematic review with meta-analysis showed a reduction in the rates of severe infection / sepsis at follow-up, after hospital discharge, associated with the kangaroo position⁽¹⁹⁾. It is also noted that rates of readmission, especially in the first six months of life, may be associated with early weaning and that breastfeeding has a protective factor for readmissions.⁽²⁰⁾

The results of this study also demonstrated a greater number of absences in the first consultation at the outpatient follow-up in the KCG group. This result can be explained by the fact that there are more consultations, in the first weeks after hospital discharge, for VLBW monitored in the third stage of the KM (on average three consultations / week), which can have an economic impact, generating expenses with transportation for families of lower socioeconomic status⁽²¹⁾, since the articulation between the hospital and primary health care, although recommended⁽²⁾, is still poorly established⁽²²⁾, especially in big cities. Another hypothesis to be raised would be that the more intense monitoring of the mother-child dyad, during the third stage of the KM, would determine a feeling of greater maternal confidence regarding the child's health and well-being and greater capacity for recognizing

signs of worsening. However, further studies are needed to address this aspect more deeply.

Important associations related to maternal empowerment and KM still remain poorly investigated⁽²³⁾. The increase in the mother's safety and ability to care for the VLBW, pillars proposed by the KM, seem to have been important characteristics that favored the KCG group. More confident mothers, aware of their child's needs, able to recognize warning signs related to their physical condition, can also contribute to better clinical outcomes. However, studies that prove these hypotheses are still need.

Among the actions carried out by the nursing team, we then highlight the need for greater empowerment and protagonism of the class, as a member of the multidisciplinary team with a greater possibility of strengthening team-family relationships, which can positively influence parents' adherence to the prescribed care. Instituting and executing evidence-based practices directly impacts positive clinical outcomes, both at the time of hospital discharge and in outpatient follow-up.

CONCLUSIONS

We conclude that the second and third stages of the KM have a positive impact on the practice and maintenance of EBF. In addition, lower rates of readmission were observed in the KCG until the sixth month of CGA, although the weight gain was similar, in both groups, after hospital discharge.

As limitations of this study, we highlight the source of the data to be obtained from medical records, since there is a risk that the registration will not be performed correctly. In addition, there were losses in the number of patients followed up, especially after hospital discharge, and it is not possible to actively search because it is a retrospective study. The type of retrospective study also made it impossible to assess other important variables, such as the time to perform the kangaroo position, the impact of KM on the bond between mother and child and maternal trust.

There is a need for greater encouragement to the active participation of the professional nurse, in all the processes of caring for these newborns and their parents, in line with the other health professionals that promote neonatal care, so that the implementation of the KM is carried out in an active manner, at all stages, with a view to

promoting comprehensive, equitable and expanded care.

REFERENCES

- 1 - Silva NR, Oliveira J, Berenguer A, Graça AM, Abrantes M, Monis C. Morbidity in Prematurity Associated with Fetal Growth Restriction: Experience of a Tertiary Care Center. *Acta Med Port.* 2018;31(11): 648-55. DOI: [10.20344/amp.9599](https://doi.org/10.20344/amp.9599)
- 2 - Huff K, Rose RS, Engle WA. Late preterm infants: Morbidities, mortality, and management recommendations. *Pediatr Clin North Am.* 2019;66(2):387-402. DOI: [10.1016/j.pcl.2018.12.008](https://doi.org/10.1016/j.pcl.2018.12.008)
- 3 - Quaresma ME, Almeida AC, Méio MDB, Lopes JMA, Peixoto MVM. Factors associated with hospitalization during neonatal period. *J Pediatr.* 2018;94(4):390-8. DOI: [10.1016/j.jpmed.2017.07.011](https://doi.org/10.1016/j.jpmed.2017.07.011)
- 4 - Brasil. Ministério da Saúde. Atenção humanizada ao recém-nascido de baixo peso: Método Canguru: Manual técnico. 3a ed. Brasília: Ministério da Saúde; 2017.
- 5 - Casper C, Sarapuk I, Pavlyshyn H. Regular and prolonged skin-to-skin contact improves short-term outcomes for very preterm infants: A dose-dependent intervention. *Arch Pediatr.* 2018;25(8):469-75. DOI: [10.1016/j.arcped.2018.09.008](https://doi.org/10.1016/j.arcped.2018.09.008)
- 6 - Aldana AAC, Tessier R, Charpak N, Tarabulsy G. Randomised controlled trial on the impact of kinesthetic stimulation on early somatic growth of preterm infants in Kangaroo position. *Acta Paediatr.* 2019;108(7):1230-6. DOI: [10.1111/apa.14675](https://doi.org/10.1111/apa.14675)
- 7 - Charpak N, Ruiz-Pelaez JG, Figueroa de CZ, Charpak Y. Kangaroo mother versus traditional care for newborn infants ≤ 2000 grams: A randomized, controlled trial. *Pediatrics* 1997;100(4):682-8. DOI: [10.1542/peds.100.4.682](https://doi.org/10.1542/peds.100.4.682)
- 8 - Yismaw AE, Gelagay AA, Sisay MM. Survival and predictors among preterm neonates admitted at University of Gondar comprehensive specialized hospital neonatal intensive care unit, Northwest Ethiopia. *Ital J Pediatr.* 2019;45(1):1-11. DOI: [10.1186/s13052-018-0597-3](https://doi.org/10.1186/s13052-018-0597-3)
- 9 - Basso CSD, Arroyo MAS, Saes MABF, Beani L, Maia AB, Lourenção LG. Breastfeeding rate and speech-language therapy in the Kangaroo Method. *Rev CEFAC* 2019;21(5):1-9. DOI: [10.1590/1982-0216/201921511719](https://doi.org/10.1590/1982-0216/201921511719)
- 10 - Boundy EO, Dastjerdi R, Spiegelman D, Fawsi WW, Missmer SA, Lieberman E, et al. Kangaroo mother care and neonatal outcomes: A meta-analysis. *Pediatrics* 2016;137(1): 1-18. DOI: [10.1542/peds.2015-2238](https://doi.org/10.1542/peds.2015-2238)
- 11 - Lamy Filho F, Silva AA, Lamy ZC, Gomes MA, Moreira ME. Evaluation of the neonatal outcomes of the kangaroo mother method in Brazil. *J Pediatr.* 2008;84(5):428-35. DOI: [10.2223/JPED.1821](https://doi.org/10.2223/JPED.1821)
- 12 - Souza AKCM, Tavares ACM, Carvalho DGL, Araújo VC. Ganho de peso em recém-nascidos submetidos ao contato pele a pele. *Rev CEFAC* 2018;20(1):53-60. DOI: [10.1590/1982-021620182018317](https://doi.org/10.1590/1982-021620182018317)
- 13 - Nobre RG, Azevedo DV, Almeida PC, Almeida NM, Feitosa FE. Weight-gain velocity in newborn infants managed with the kangaroo method and associated variables. *Matern Child Health J* 2017;21(1):128-35. DOI: [10.1007/s10995-016-2101-2](https://doi.org/10.1007/s10995-016-2101-2)
- 14 - Maia C, Brandao R, Roncalli A, Maranhao H. Length of stay in a neonatal intensive care unit and its association with low rates of exclusive breastfeeding in very low birth weight infants. *J Matern Fetal Neonatal Med.* 2011;24(6):774-7. DOI: [10.3109/14767058.2010.520046](https://doi.org/10.3109/14767058.2010.520046)
- 15 - Balamint T, Sousa MI, Gomes ALM, Christoffel MM, Leite AM, Scochi CGS. Aleitamento materno em prematuros egressos de hospitais amigos da criança do Sudeste. *Rev Eletrônica Enferm.* 2018 [citado em 28 nov 2020]; 20:1-14. Acesso em: <https://revistas.ufg.br/fen/article/view/50963>
- 16 - Sousa DS, Sousa Júnior AS, Santos ADR, Melo EV, Lima SO, Almeida-Santos MA, et al. Morbidity in extreme low birth weight newborns hospitalized in a high risk public maternity. *Rev Bras Saúde Mater Infant.* 2018;17(1):139-47. DOI: [10.1590/1806-93042017000100008](https://doi.org/10.1590/1806-93042017000100008)
- 17 - Cavallo MC, Gugistti A, Gerzeli S, Bsrbieri D, Zanini R. Cost of care and social consequences of very low birth weight infants without premature-

related morbidities in Italy. Ital J Pediatr. 2015;41(59):1-12. DOI: [10.1186/s13052-015-0165-z](https://doi.org/10.1186/s13052-015-0165-z)

18 - Cattaneo A, Davanzo R, Worku B, Surjono A, Echeverria M, Bedri A, et al. Kangaroo mother care for low birth weight infants: a randomised controlled trial in different settings. Acta Paediatr. 1998;87:976-85. DOI: [10.1111/j.1651-2227.1998.tb01769](https://doi.org/10.1111/j.1651-2227.1998.tb01769)

19 - Conde-Agudelo A, Díaz-Rossello JL. Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. Cochrane Database Syst Rev. 2014; 22(4):CD002771. DOI: [10.1002/14651858.CD002771.pub3](https://doi.org/10.1002/14651858.CD002771.pub3)

20 - Silva TR, Rossetto EG, Souza SNDH, Baena JA. A incidência de reinternações entre prematuros de muito baixo peso e suas associações. Rev Varia Scientia 2015;2(1):119-29. DOI: [10.48075/vscs.v1i2.12912](https://doi.org/10.48075/vscs.v1i2.12912)

21 - Araújo CL, Rios CTF, Santos MH, Gonçalves APF. Método Mãe Canguru: Uma investigação da prática domiciliar. Cienc Saude Coletiva 2010;15(1):301-7. DOI: [10.1590/S1413-81232010000100035](https://doi.org/10.1590/S1413-81232010000100035)

22 - Reichert APS, Soares AR, Bezerra ICS, Guedes ATA, Pedrosa RKB, Vieira DS. Terceira etapa do método canguru: Experiência de mães e profissionais da atenção primária. Esc Anna Nery 2021;25(1): 1-7. DOI: [10.1590/2177-9465-ean-2020-0077](https://doi.org/10.1590/2177-9465-ean-2020-0077)

23 - Braga DF, Machado MM, Bosi ML. Achieving exclusive breastfeeding of premature babies: The perceptions and experience of women from public health services. Rev Nutr 2008;21(3):293-302. DOI: [10.1590/S1415-52732008000300004](https://doi.org/10.1590/S1415-52732008000300004)

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