





## SCOPING REVIEW PROTOCOL

### The Kangaroo Method as a supporter of milk production for breastfeeding premature newborns: A scoping review protocol

### Método Canguru como apoiador da produção láctea para amamentação de recém-nascidos prematuros: protocolo *scoping review*

### Método Canguro como apoyo a la producción de leche para la lactancia de recién nacidos prematuros: protocolo de revisión del alcance

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#### ABSTRACT

**Objective:** To map and describe the studies available in the scientific literature on the effect of the kangaroo method as a supporter of milk production for breastfeeding hospitalized premature babies. **Methodology:** This is a scoping review protocol, developed in accordance with the recommendations of the Joanna Briggs Institute and the Preferred Reporting Items for Systematic and Meta-Analyses - Extension for Scoping Reviews (PRISMA-ScR). The search will be carried out in the databases PubMed, Scopus, Web of Science, Excerpta Medica data BASE, SciELO, COCHRANE, American Psychological Association and the portal of the Virtual Health Library and Theses and Dissertations of the Coordination for the Improvement of Higher Education Personnel. The data will be searched and analyzed by two independent researchers, without time or language limits. **Conclusion:** The protocol will guide the systematization of the development of the scoping review that will map and describe studies on the effect of the kangaroo method as a supporter of milk production.

**DESCRIPTORS:** Premature; Mothers; Kangaroo-mother Care Method; Breastfeeding.

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## RESUMO

**Objetivo:** Mapear e descrever os estudos disponíveis na literatura científica acerca do efeito do método canguru como apoiador da produção láctea para amamentação de bebês prematuros hospitalizados. **Metodologia:** Refere-se a um protocolo de *scoping review*, desenvolvido conforme às recomendações do Instituto Joanna Briggs, e do *Preferred Reporting Items for Systematic and Meta-Analyses – Extension for Scoping Reviews* (PRISMA-ScR). A pesquisa será realizada nas bases de dados PubMed, Scopus, Web of Science, Excerpta Medica data BASE, SciELO, COCHRANE, *American Psychological Association* e no portal da Biblioteca Virtual em Saúde e Teses e Dissertações da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior. A busca e análise dos dados será realizada por dois pesquisadores independentes, sem limite de tempo e idioma. **Conclusão:** O protocolo orientará a sistematização do desenvolvimento da revisão de escopo que irá mapear e descrever estudos sobre o efeito do método canguru como apoiador da produção láctea.

**DESCRIPTORES:** Recém-nascido Prematuro; Mães, Método Canguru; Aleitamento Materno.

## RESUMEN

**Objetivo:** Mapear y describir los estudios disponibles en la literatura científica sobre el efecto del método canguro como apoyo a la producción de leche materna en prematuros hospitalizados. **Metodología:** Protocolo de revisión exploratoria, desarrollado de acuerdo con las recomendaciones del Instituto Joanna Briggs y *Preferred Reporting Items for Systematic and Meta-Analyses – Extension for Scoping Reviews* (PRISMA-ScR). La investigación se realizará en las bases de datos PubMed, Scopus, Web of Science, Excerpta Medica data BASE, SciELO, COCHRANE, *American Psychological Association* y el portal de la Biblioteca Virtual de Salud y Tesis y Disertaciones de la Coordinación para el Perfeccionamiento del Personal de Educación Superior. La búsqueda y el análisis de datos se realizará por dos investigadores independientes, sin límites de tiempo ni de idioma. **Conclusión:** El protocolo orientará la sistematización del desarrollo de la revisión de alcance que mapeará y describirá estudios sobre el efecto del método canguro como apoyo a la producción de leche.

**DESCRIPTORES:** Recien Nacido Prematuro; Madres; Método Madre-canguro; Lactancia Materna.

## INTRODUCTION

Prematurity is an urgent public health problem worldwide. Every year, around 15 million newborns (NBs) are premature and more than 20 million NB have low birth weight worldwide, making prematurity the leading mortality cause in children under five years of age<sup>(1)</sup>. Babies born before the 37<sup>th</sup> gestational week are considered premature<sup>(2)</sup>, extreme premature (when born before 28 weeks), very premature (28 to 31 weeks and 6 days) and moderately to late premature (32 to 36 weeks and 6 days of gestation)<sup>(3)</sup>.

In this context, the World Health Organization (WHO) published new recommendations implementing the Kangaroo Care Method (KCM) as a strategy for caring for preterm NB (PTNB) in 2022, in order to possibly reduce mortality rates in this age group<sup>(1)</sup>. KCM is a strategy used and already implemented in Brazil. It is a model of perinatal care aimed at humanized care and improving the quality of this care, which aims to reduce the costs of perinatal care and promote, through early skin-to-skin

contact between mother and NB, a greater emotional bond, greater thermal stability and better development<sup>(4)</sup>.

The kangaroo position is used with low-weight NBs, in skin-to-skin contact, in an upright position, on the chest of their parents or other family members. It must be carried out in a guided, safe manner and accompanied by care support from appropriately trained healthcare staff<sup>(4)</sup>.

PTNBs have many developmental characteristics: little energy reserve, greater cerebral and hepatic metabolism, greater need for glucose for energy and cerebral metabolism, greater insensible water loss, limited production of enzymes in the gastrointestinal tract (GIT). They also frequently experience stressful events such as hypoxia, respiratory discomfort, sepsis, among others. These needs and characteristics can be met by breast milk<sup>(5)</sup>.

Human milk provides newborns with nutrients for growth and development, but it also offers bioactive modulators for neonatal development. The changes that PTNBs will face in order to adapt to life outside the womb mean that they need a lot of the nutrition offered by breast milk<sup>(6)</sup>, i.e. proteins, lipids, carbohydrates, minerals, vitamins, enzymes and living cells. In addition to providing nutrients, it contributes immunological, psychological and economic benefits<sup>(7)</sup>. The breastfeeding (BF) recommendation for PTNBs has been advocated because of the immunological properties of milk, its role in GIT maturation, the bond developed between mother and child and the improvement in neurobehavioral performance demonstrated by breastfed infants<sup>(8)</sup>. Performing KCM with the mother during the PTNB's hospitalization significantly reduces the incidence of serious infections when compared to newborns who undergo the traditional method<sup>(9)</sup>.

Construction of this protocol took place against this backdrop, as it is justified by the need to delve deeper into the benefits of the kangaroo position for milk production. In order to meet this need, it is considered necessary to map the available evidence on this subject matter, as there is a knowledge gap regarding research studies addressing the effect of the kangaroo position on milk production.

## **OBJECTIVE**

To map and describe the studies available in the scientific literature on the effect of the Kangaroo Method as a supporter of milk production for breastfeeding hospitalized premature newborns.

## **METHODOLOGY**

### **Type of study**

It refers to a scoping review protocol, based on the recommendations of the Joanna Briggs Institute (JBI) and according to the guidelines set forth in the Preferred Reporting Items for Systematic and Meta-Analyses - Extension for Scoping Reviews (PRISMA-ScR)<sup>(10-11)</sup>. This protocol has been

registered in the Open Science Framework (OSF), identified by DOI: 10.17605/OSF.IO/6E3PD and available at [https://osf.io/6e3pd/?view\\_only=e0deca4983b44c019399d0386ff56c98](https://osf.io/6e3pd/?view_only=e0deca4983b44c019399d0386ff56c98).

The following sequence will be adopted to develop this scoping review: 1) Identification of the topic and selection of the study question, discussed and defined by the authors; 2) Definition of criteria for eligibility and non-eligibility of the studies that will make up the results of this research; 3) Definition of the elements to be extracted from the studies selected; 4) Qualitative assessment of the studies included in the scoping review; 5) Interpretation of the results; and 6) Synthesized presentation of the information extracted from the studies<sup>(12)</sup>.

### **Formulating the research question**

The review question was drawn up using the Population, Concept and Context (PCC) strategy: P - Premature newborns; C - Effects of the Kangaroo Method on milk production; C - Hospitalization in neonatal units. With this in mind, the following guiding question was formulated: Which is the effect of the Kangaroo Method as a supporter of milk production for breastfeeding hospitalized premature newborns?

### **ELIGIBILITY CRITERIA**

The eligibility criteria to select the materials found in the databases will be as follows: scientific articles originating from descriptive or analytical, quantitative or qualitative studies; mixed-methods studies and systematic reviews; studies meeting the review objective; material available in full; in electronic media; with no time or language limits. Studies from the Gray Literature (dissertations and theses) will also be included in order to broaden the results.

The ineligibility criteria will be the following: articles in editorial settings; letters to the editor; opinion articles and advertorials. Other reasons that may arise during the analysis that need to be excluded will be recorded and reported in the scoping review.

### **Search strategy and identification of studies**

The information sources will be searched using the descriptors selected from DeCS and MeSH and using the AND and OR Boolean operators. The keywords and search expressions used will be "kangaroo-mother", "lactation", "breast", "feeding", "infant, premature", "premature birth" with variations between descriptors and alternative terms. The databases and portals to be consulted are PubMed, Scopus, Web of Science (WoS), Excerpta Medica data BASE (EMBASE), SciELO, COCHRANE, American Psychological Association (PsycInfo) and the portal of the Virtual Health Library (*Biblioteca Virtual em Saúde*, BVS) and Theses and Dissertations of the Coordination for the Improvement of Higher Education Personnel (*Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*, CAPES). In order to identify the relevant studies through standardized collection, the search will be carried out through the

CAPES Platform via the Federal Academic Community (*Comunidade Acadêmica Federal*, CAFE), logged in to the university to which this study is linked (Chart 1).

Chart 1. Development of the search strategies. Londrina, PR, Brazil, 2024.

Database / Portal	Search strategy
PubMed	#1 "kangaroo-mother" AND lactation AND breast AND feeding" #2 "Kangaroo-Mother Care Method" AND "Breast Feeding" AND "Infant, Premature" AND "Premature Birth" #3 "Kangaroo-Mother Care Method" AND "Breast Feeding" AND "Infant, Extremely Premature" or "Infant, Extremely Low Birth Weight" #4 "Kangaroo-Mother Care Method" AND "Breast Feeding" or "Milk Human" or "Breast Milk Expression" #5 "Kangaroo-Mother Care Method" AND "Breast Feeding" or "Milk Ejection" AND "Intensive Care Units, Neonatal" #6 "Maternal Behavior" AND "Kangaroo-Mother Care Method" AND "Breast Feeding"
PsycInfo	#1 Kangaroo-Mother Care Method AND Breast Feeding #2 "Kangaroo-Mother Care Method" AND "Breast Feeding" AND "Infant, Premature" and "Premature Birth" #3 "Kangaroo-Mother Care Method" AND "Breast Feeding" or "Infant, Extremely Premature" or "Infant, Extremely Low Birth Weight" #4 "Kangaroo-Mother Care Method" AND "Breast Feeding" AND "Milk Human" and "Breast Milk Expression"
Scopus	#1 kangaroo-mother AND lactation AND breast AND feeding #2 Kangaroo-Mother Care Method AND Breast Feeding AND "Infant, Premature" and "Premature Birth" #3 Kangaroo-Mother Care Method AND Breast Feeding AND "Infant, Extremely Premature" or "Infant, Extremely Low Birth Weight" #4 "Kangaroo-Mother Care Method" AND "Breast Feeding" or "Milk Human" or "Breast Milk Expression" #5 "Kangaroo-Mother Care Method" AND "Breast Feeding" or "Milk Ejection" AND "Intensive Care Units, Neonatal" #6 "Maternal Behavior" AND "Kangaroo-Mother Care Method" and "Breast Feeding"
EMBASE	#1 kangaroo-mother AND lactation AND breast AND feeding #2 ('kangaroo-mother care method') AND ('breast feeding') AND ('infant, premature') AND ('premature birth') #3 "Kangaroo-Mother Care Method" AND "Breast Feeding" AND "Infant, Extremely Premature" OR "Infant, Extremely Low Birth Weight" #4 "Kangaroo-Mother Care Method" AND "Breast Feeding" OR "Milk Human" or "Breast Milk Expression"
SciELO	#1 Método Canguru AND Aleitamento Materno AND Recém-Nascido Prematuro or Nascimento Prematuro #2 Método Canguru AND Aleitamento Materno or Leite humano or Extração de Leite
BVS	#1 "Método Canguru" AND "Aleitamento Materno AND "Recém-Nascido Prematuro" or "Nascimento Prematuro" #2 "Método Canguru" AND "Aleitamento Materno" AND "Lactente Extremamente Prematuro" or "Recém-Nascido de Peso Extremamente Baixo ao Nascer" #3 "Método Canguru" AND "Aleitamento Materno" or "Leite humano" or "Extração de Leite" #4 "Método Canguru" AND "Aleitamento Materno" or "Ejeção Láctea" AND "Unidades de Terapia Intensiva Neonatal" #5 "Comportamento Materno" AND "Método Canguru" AND "Aleitamento Materno"
WoS	#1 "Kangaroo-Mother Care Method" AND "Breast Feeding" AND "Infant, Extremely Premature" or "Infant, Extremely Low Birth Weight" #2 kangaroo-mother AND lactation AND breast AND feeding #3 "Kangaroo-Mother Care Method" AND "Breast Feeding" or "Milk Human" or "Breast Milk Expression" #4 "Kangaroo-Mother Care Method" AND "Breast Feeding" or "Milk Ejection" AND "Intensive Care Units, Neonatal"
CAPES	#1 ("Método Canguru") AND ("Unidades de Terapia Intensiva Neonatal") #2 ("Aleitamento Materno") AND ("Unidades de Terapia Intensiva Neonatal")
COCHRANE	#1 kangaroo-mother AND lactation AND breast AND feeding #2 Kangaroo-Mother Care Method AND Breast Feeding AND Infant, Premature AND Premature Birth #3 Kangaroo-Mother Care Method AND Breast Feeding AND Infant, Extremely Premature OR Infant, Extremely Low Birth Weight #4 Kangaroo-Mother Care Method AND Breast Feeding or Milk Human or Breast Milk Expression #5 Kangaroo-Mother Care Method AND Breast Feeding or Milk Ejection and Intensive Care Units, Neonatal #6 Maternal Behavior AND Kangaroo-Mother Care Method AND Breast Feeding

Source: Prepared by the authors

## Data organization

The process of searching for materials in the information sources selected will take place independently and the studies will be exported to a spreadsheet. For this stage, we will use the State of the Art through Systematic Review (StArt)® software, a tool developed by the Software Engineering Research Laboratory of the IT Department at the Federal University of São Carlos<sup>(13)</sup>. This software helps detect duplicate studies and to identify studies according to the eligibility criteria.

## Data extraction process

This stage will be carried out by two reviewers, using a data extraction form that will contain the information shown in Table 2. This phase requires the readers to have a coherent and detailed orientation of what has been found in the literature, in line with the research objective and question. If one of the readers disagrees, a third reviewer will be called in<sup>(14)</sup>. The studies that pass the first selection will be read in full and new exclusion cases may be made. All references of the studies selected will be read and new studies may be selected after applying the inclusion criteria. The studies selected will be read again to be included in the results.

It should be noted that before this stage begins, a pilot test will be carried out with five articles read at random to test the form. If changes are necessary, they will be detailed in the full scoping review. The objective of this stage is to identify the studies that met the inclusion criteria (Chart 2).

Chart 2. Instrument developed for data extraction, Londrina, PR, 2024

Details and characteristics of the evidence sources	
Identification of the studies selected	Authors Publication year Study country
Methodological design	Type of study Study sample Study duration Population: characterization of the newborns (delivery type, gestational age, age, weight, number of Kangaroo Method sessions).
Main study results	Effects of the kangaroo position on breast milk production

Source: Prepared by the authors

## Data presentation and analysis

The results will be presented descriptively and qualitatively in the form of tables, graphs, images or in a descriptive manner according to need, with the purpose of answering the review question and objective, along with a narrative process. The PRISMA-ScR flowchart<sup>(11)</sup> (Figure 1) will be used to describe the entire selection process.

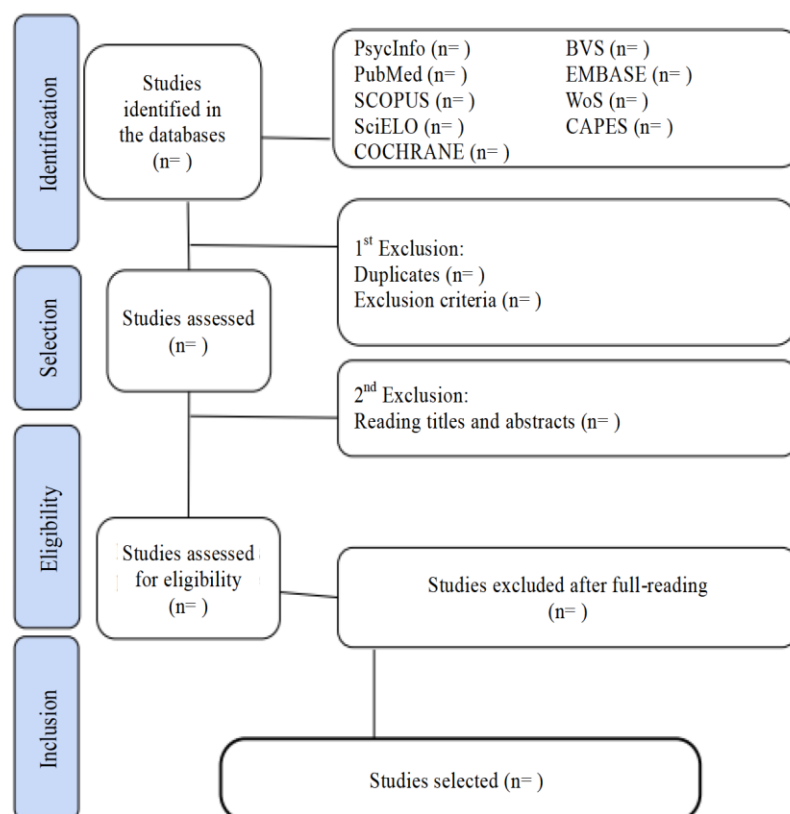


Figure 1. Flowchart that will be adopted in the review, 2024

## Ethical aspects

For being a review study, it is not necessary to obtain approval from any Human Research Ethics Committee. However, it should be noted that all ethical aspects will be preserved and the authors of the studies selected will be cited in the text.

## CONCLUSION

The protocol will guide development of the scoping review that will map and describe the studies available in the scientific literature on the effect of the Kangaroo Method as a supporter of milk production for breastfeeding hospitalized premature newborns. It should be emphasized that breastfeeding is important for the development of premature infants, as well as for enhancing the mother-child bond. A supporting component for breastfeeding is KCM, a humanized care strategy aimed at reducing the perinatal care costs and promoting a deeper emotional bond, greater thermal stability and better development through early skin-to-skin care between mother and NB. Thus, integrating these two types of care can contribute many benefits to mothers and newborns alike.

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