

# Humanizing Neonatal Resuscitation: The Contribution of the Kangaroo Method

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Citation: F Tahiri, et al. Humanizing Neonatal Resuscitation: The Contribution of the Kangaroo Method. *J Pediatric Adv Res.* 2026;5(1):1-7.

<https://doi.org/10.46889/JPAR.2026.5106>

Received Date: 25-01-2026

Accepted Date: 16-02-2026

Published Date: 23-02-2026



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## Abstract

The Kangaroo Mother Care Method is a holistic and personalized approach to the neurodevelopmental care of newborns. Its primary goal is to reduce environmental stress by adapting the environment and care practices to protect the developing brain and optimize neurological growth. The Kangaroo Mother Care Method also involves parents, particularly the mother, through prolonged skin-to-skin contact.

Our descriptive analytical study aims to improve and facilitate the practice of the Kangaroo method by all mothers in the neonatal intensive care unit of the Mohammed VI University Hospital Center in Tangier.

This is a survey conducted with 70 mothers of newborns hospitalized in the intensive care unit to determine the benefits and challenges of the Kangaroo method.

The results of our study identified several advantages of this method, with 89% of mothers observing that their newborns became calmer and slept longer during its practice. This was in addition to improvements in physiological parameters (temperature and heart rate). Furthermore, all mothers confirmed that the Kangaroo Mother Care method helps manage stress and anxiety during their baby's hospitalization.

However, our study identified several obstacles to improve for the proper practice of this technique, such as the position of the chairs, respect for privacy; and a quiet environment.

Through our study we concluded that the skin- to -skin or Kangaroo technique is promising thanks to its positive impact on maternal and infant health, not forgetting that it requires more technical and psychosocial support to optimize its adoption in the various maternity services.

**Keywords:** Kangaroo Method; Neurodevelopmental Care; Skin-To-Skin Contact; Maternal and Infant Health; Newborn

## Introduction

Neurodevelopmental care in the neonatal intensive care unit is a comprehensive and personalized approach aimed at supporting the brain and neurological development of newborns, particularly those born prematurely or with significant neurological risks. These newborns, whose nervous system is still immature and fragile, are exposed to an often stressful environment, marked by loud noises, excessive light, frequent handling and repeated medical interventions, all factors that can harm their brain maturation and disrupt their natural biological rhythms.

The main objective of neurodevelopmental care is therefore to reduce these environmental stresses by adapting the environment and care practices, in order to protect the developing brain and optimize neurological growth.

This includes limiting harmful stimuli such as sudden noises and bright lights, reducing the number of unnecessary handling procedures and respecting the baby's sleep and wake cycles, which are essential for its development. Parental involvement is another fundamental pillar of this approach, through skin-to-skin contact, often called the Kangaroo method. This method is closely linked to neurodevelopmental care, as it constitutes an essential component aimed at promoting the optimal development of the newborn. This method is based on prolonged skin-to-skin contact between the baby and its parents, usually the mother, which allows for the establishment of a strong and reassuring emotional bond.

From a neurodevelopmental perspective, this direct contact plays a key role in the baby's physiological regulation, helping to stabilize their body temperature, heart rate, breathing and stress levels. By reducing environmental stressors and providing a gentle and secure sensory environment, the Kangaroo Care method supports the baby's immature nervous system, promoting sleep, growth and brain development. Furthermore, skin-to-skin contact stimulates the mother's production of oxytocin, a hormone linked to well-being, which strengthens the emotional bond and enhances the quality of care provided. This approach is fully aligned with the philosophy of neurodevelopmental care, which seeks to limit excessive stimulation and respect the newborn's biological rhythms, while emphasizing positive interactions with parents.

Within the neonatal intensive care unit, medical staff play a fundamental role in encouraging and implementing the Kangaroo Mother Care method. Their mission is to inform, reassure and support families in this practice, explaining the benefits of skin-to-skin contact for the neurological, physiological and emotional development of the newborn, while also addressing the concerns of parents often weakened by premature birth or medical complications [1-3].

Through our survey of mothers who practiced the Kangaroo method in the neonatal intensive care unit of the Mohammed VI University Hospital in Tangier, we set very specific objectives which are as follows.

1. List the benefits of the Kangaroo method for the mother and her newborn
2. Report the mothers' experiences after practicing this method
3. List the constraints encountered when practicing the Kangaroo method
4. To establish proposals with the aim of improving and facilitating the practice of the Kangaroo method by all mothers

## Material and Methods

Our survey aims to evaluate the benefits and challenges of Kangaroo care, as practiced in the neonatal intensive care unit. It is based on a questionnaire administered to mothers of newborns hospitalized in our unit. To properly answer our research questionnaire, our survey primarily includes any mother who has practiced the Kangaroo method at least once during the hospitalization of her newborn in a neonatal intensive care unit. The anonymity and confidentiality of information from mothers and their newborns were respected during our survey.

## Results

Regarding maternal characteristics, in our survey the majority of mothers were between 20 and 40 years old, with a percentage of 87%. Mothers with an average level of education represented 55% in our survey, compared to 33% with a low level, while a high level was observed in 12% of mothers. The middle socio-economic level was the most frequent with a percentage of 74%. The majority of mothers were married, with a rate of 97%, while single mothers represented only 3%. In our survey, 51% of mothers had 1 to 2 children, while 41% had 3 to 4 children and only 8% had 5 or more. A rate of 78% of mothers received adequate medical monitoring during pregnancy, while 22% received inadequate monitoring.

Cesarean delivery predominated slightly (54%) compared to vaginal delivery (46%). In our questionnaire, nearly 8 out of 10 mothers (77%) had a simple postpartum, compared to 23% who had complicated postpartum situations requiring specialized care. Regarding neonatal characteristics, the majority of newborns who benefited from the Kangaroo method were moderately premature (52%) (between 33-36 weeks of amenorrhea), while extremely premature (29-32 weeks of amenorrhea) represented only 13% of cases. Prematurity (60%) was the main reason for hospitalization of the newborns involved in our study, followed by neonatal respiratory distress (50%) and maternal-fetal infections (48%), while jaundice (20%) and other pathologies (15%) were less frequent.

It should be noted that the combination of several indications for hospitalization was noted in the majority of our patients. Most of the newborns (70%) were hospitalized for a period of between 7 and 30 days. For the Kangaroo method, our survey showed that only 25% of mothers were previously familiar with the Kangaroo method, while the vast majority (75%) were discovering it for the first time in the context of our study.

In our survey, the main source of information was medical staff with a rate of 83%, followed by social media in 14%, while only 3% of mothers were informed by other mothers who had already practiced the Kangaroo method. Prior experience with the Kangaroo method was noted in 18% of mothers, while the vast majority were unfamiliar with this method.

All the mothers interviewed expressed great satisfaction and a relieving effect from the very first practice of the Kangaroo method. In our survey, the constraints of practicing the Kangaroo method were technical in the majority of cases, with a percentage of 73% distributed as follows: 41% related to the presence of an IV drip, 32% because of monitors and alarms, 24% because of the uncomfortable chair position, 13% due to the lack of privacy explained by the presence of another mother and only in 3% was the pathology of the newborn a constraint. The practice of the 30-minute Kangaroo method was noted in 51% of mothers, 36% practiced for 1 hour, while only 13% opted for longer sessions.

The majority of mothers, with a percentage of 56%, judged the duration of the Kangaroo method practice to be insufficient, expressing a desire for longer sessions. Kangaroo care has proven numerous benefits for both newborns and their mothers. In our survey, we observed that most newborns were calm when this method was practiced, with a rate of 89% of cases and sleep improved in 73% of cases. All the mothers reported that practicing this method made it easier to manage their anxiety and stress during their babies' hospitalization and as a result, they recommended it to other mothers.

## Discussion

In 1978, in Colombia, Dr. Rey Edgar proposed an original idea to address the shortage of incubators : an emergency measure to warm premature or low birth weight infants. At the time, there was no systematic implementation or validation of the method. The position was not the same as today: newborns were carried in a hammock, which led to respiratory problems and therefore Sudden Infant Death Syndrome (SIDS). Due to infant mortality, the practice was refined and infants were held in an upright position in direct skin-to-skin contact with the mother or the adult carrying them. During the earthquake that occurred in southern Colombia, the Kangaroo method used in Bogota was applied in the disaster area in southern Colombia and thus spread throughout the territory. The method is based on the proper use of the mother's and family's metabolism, with three essential aspects:

- Maintaining the Kangaroo position
- Skin-to-skin contact
- Maintaining and promoting breastfeeding

Originally, the method was created as an emergency response to address the lack of incubators, which were insufficient in number and quality [4]. In the 1990s, the Kangaroo Mother Care Method was gradually introduced in some Moroccan hospitals, particularly in Rabat and Casablanca, under the impetus of pediatricians and international organizations such as the WHO and UNICEF, with efforts focused on training healthcare professionals and raising awareness among families [5].

During the 2000s and 2010s, the method spread to other hospitals, supported by pilot projects from the Ministry of Health and was partially integrated into the neonatal care protocols of university hospitals [6]. From 2015 onwards, initiatives intensified to generalize the Kangaroo Mother Care method, particularly in rural areas, through collaborations with partners such as UNICEF and Save the Children, in order to promote maternal and neonatal care [7]. It is a simple and inexpensive technique consisting of holding the newborn in an upright position 24 hours a day, directly skin-to-skin on the mother's chest [8].

It is suitable for all newborns, whether stable or unstable. For very premature infants weighing less than 800 g or having less than 26 weeks of gestational age or those requiring assisted ventilation, the Kangaroo method is possible under certain conditions, with increased monitoring by the nurse [9]. The Kangaroo Method comprises all non-pharmacological strategies aimed at improving the comfort of premature or low birth weight newborns and supporting their development in its physiological, neurological, behavioral and relational aspects [10].

It allows for the combination of several elements of developmental care which include: diagonal flexion posture and swaddling, non-nutritive sucking, reduction of the light and noise environment and follow-up and support upon discharge from the hospital [11].

Numerous studies have shown the benefits of this method for the full-term newborn in general and for the premature infant, for parents but also for healthcare staff, it helps with weight gain and the reduction of care-related infections, but also the protection of the newborn from the light and noise environment and the improvement of neurological and psychomotor development, the improvement of sleep quality and behavioral development, the reduction of stress, the improvement of growth [11].

It ensures improved thermoregulation and cardiorespiratory parameters in premature infants [9]. It helps strengthen the parent-newborn bond and reduce postpartum stress and depression in the mother [11]. It also establishes a closer relationship between parents and the healthcare team.

In the Yattara AM, series, the majority of mothers applying the Kangaroo method are aged between 18 and 35 years, while in the "kamo" series selangai, et al., the age of the mothers varied mainly between 20 and over 30 years with a percentage of 84%, this agreed approximately with the results of our study in which the age of the mothers varied between 20 and 40 years with a percentage of 87% [12,13]. Kamo series selangai, et al, the education level of most mothers was low with a percentage of 65% this was consistent with the series of yattara AM, where most mothers had a low education level with a percentage of 56%, but disagreed with our study where most mothers had an average education level of 55% [12,13].

A percentage of 61.3% of mothers who used the Kangaroo method were married, compared to 38.8% of single mothers in the Kamo series Selangai, et al. [13]. However, in Vatelot 's series [14], only 36% of mothers were married, compared to 63% of single mothers. Whereas in our series, 97% of mothers were married, compared to a minimal 3% of single mothers.

Regarding the characteristics of the newborns, in the series by Foong WC, et al., most newborns benefiting from the Kangaroo Mother Care method were born between 27 and 33 weeks of gestation. This was consistent with the study by Yattara AM, where most were premature infants between 28 and 32 weeks [12,15]. In contrast, in the study by Vatelot L, most newborns were born at term; this was consistent with our study, where most newborns were born between 33 and 36 weeks [14].

Our results revealed significantly higher proportions for the main reasons for hospitalization compared to the Vatelot study [14]. In our cohort, prematurity was the main reason in 60% of cases versus 31% in Vatelot , followed by maternal -fetal infections in 48% of cases vs 24%. Our results corroborated those of Yattara AM, regarding the high prevalence of neonatal respiratory distress and jaundice in newborns [12].

In the Yattara AM series [12] the majority of newborns with a percentage of 62% had a stay between 10 and 30 days which was consistent with our study where 70% had a stay between 7 and 30 days. In the study by Foong WC, et al., most mothers practiced the method only once a day, with each session lasting between 30 minutes and two hours. Whereas in our study, most mothers who practiced the Kangaroo method had an average duration of between 30 minutes and 1 hour [15]. Regarding the benefits of the Kangaroo method , according to Mohamed 's meta-analysis Elham, et al., reported that several studies have demonstrated the physiological and behavioral benefits of Kangaroo care, including improved thermoregulation and cardiorespiratory parameters in premature infants [16].

Furthermore, according to the study by Pierrat, et al., the Kangaroo method has proven a significant increase in sleep, with calmer periods of sleep and wakefulness when the newborn is carried in a Kangaroo position rather than placed in an incubator. [17]. This was consistent with the findings of our series where 89% of newborns exhibited an increased state of calm, 73% had improved sleep quality and 50% had better thermoregulation associated with a normal heart rate.

The series by Athanasopoulou, et al., confirmed that this method helped to promote the mother-newborn bond and attachment, to reduce anxiety and depression in the mother and to help parents take care of their baby [18]. This was consistent with our study where all the mothers reported that this practice facilitated the management of their anxiety and stress during their baby's hospitalization.

For the obstacles to practicing the Kangaroo method in the study by Jefferies he cited lack of knowledge, inadequate information, discomfort with the process, lack of time or resources, lack of privacy, the latter point joined our study where 13% of mothers expressed that the presence of other mothers during the application of the method constituted a disturbing obstacle [9]. In the study by Foong mothers reported that medical interventions with their baby, such as the fact that it was in an incubator, the presence of a nasogastric tube, intravenous lines and other medical supplements, had increased their insecurity [15-18].

## Conclusion

The results of our study highlight the many benefits of the Kangaroo method: improved physiological stability of newborns, strengthening of the parent-newborn bond, reduction of neonatal stress, as well as a favorable impact on the length of hospital stay and long-term neurological development. In an environment as technically advanced as neonatal resuscitation, the introduction of the Kangaroo method represents a return to a more humanized form of care, centered on the relationship and physical closeness. It does not replace intensive care, but complements it effectively, provided it is integrated in an appropriate, safe and supervised manner by a trained and committed team. Our work also highlights the organizational, cultural and emotional barriers to its integration into the various neonatal resuscitation services, requiring a comprehensive reflection on care practices, professional training and support for families.

## Recommendations

The effective integration of the Kangaroo method in neonatal resuscitation does not rely solely on equipment or protocols, but on a culture of care centered on human beings, safety and kindness. An informed, trained and committed team is the key to making this method a powerful tool for the well-being and development of premature and vulnerable newborns. Attached is a list of concrete recommendations to be offered to healthcare staff to improve the practice of the Kangaroo method within the neonatal intensive care unit. These recommendations aim to facilitate its integration, ensure the safety of the newborn and strengthen the commitment of care teams and parents.

### 1. Strengthen Training and Awareness

- Organize regular training sessions on the principles, benefits and practical aspects of the Kangaroo method
- Train teams in the safe handling of unstable, intubated or medically equipped newborns.
- To raise staff awareness of the key role of skin-to-skin contact in the development of the parent-newborn bond and the baby's clinical recovery

### 2. Develop Protocols Adapted to the Context of Neonatal Resuscitation

- Develop clear and safe protocols integrating the Kangaroo method into intensive care
- Define inclusion/exclusion criteria to identify newborns who can benefit from the method without compromising their safety
- Standardize the duration and frequency of sessions according to the clinical condition

### 3. Encourage Parental Involvement

- Inform and reassure parents about their active role in the care process through skin-to-skin contact
- Offer personalized interviews to answer their questions and address any concerns they may have
- Create spaces conducive to intimacy, warmth and comfort during babywearing sessions

### 4. Adapt the Service Environment

- Reorganize care stations and incubators to facilitate ergonomic access to the baby for skin-to-skin contact, even under assisted ventilation
- Provide comfortable armchairs, appropriate lighting and curtains to promote a calming atmosphere

### 5. Working in a Multidisciplinary Team

- To promote close collaboration between doctors, nurses, midwives, physiotherapists and psychologists to assess and support each situation
- Create a group of Kangaroo Method referents within the department to promote and support the practice

#### 6. Regularly Evaluate the Practice of the Kangaroo Method

- Implement monitoring of quality indicators related to the practice of the method (number of sessions, family satisfaction, clinical effects)
- Gather feedback from families and staff to adjust practices

#### 7. Train Mothers During Pregnancy on the Practice of the Kangaroo Mother Care Method

- Explain the importance of continuous skin-to-skin contact, exclusive breastfeeding and close medical monitoring for premature or low-weight babies
- Demonstrate how to position the baby skin-to-skin under the mother's clothing, manage thermoregulation and recognize warning signs requiring consultation
- Strengthen confidence and autonomy by encouraging mothers to practice MMK from birth and reassuring them about its effectiveness for the health and growth of the baby

#### Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

#### Funding Statement

This research did not receive any specific grant from funding agencies in the public, commercial or non-profit sectors.

#### Acknowledgement

None

#### Data Availability Statement

Not applicable.

#### Ethical Statement

The project did not meet the definition of human subject research under the purview of the IRB according to federal regulations and therefore, was exempt.

#### Informed Consent Statement

Informed consent was taken for this study.

#### Authors' Contributions

All authors contributed equally to this paper.

#### References

1. WHO Immediate KMC Study Group, Arya S, Naburi H, Kawaza K, et al. Immediate Kangaroo mother care and survival of infants with low birth weight. *N Engl J Med.* 2021;384(21):2028-38.
2. Zengin H, Karakaya Suzan O, Hur G, Kolukisa T, Eroglu A, Cinar N. The effects of Kangaroo mother care on physiological parameters of premature neonates in neonatal intensive care units: A systematic review. *J Pediatr Nurs.* 2023;71:e18-27.
3. Sivanandan S, Sankar MJ. Kangaroo mother care for preterm or low birth weight infants: A systematic review and meta-analysis. *BMJ Glob Health.* 2023;8(6):e010728.
4. Caicedo L. Premature babies and low birth weight: presentation of the Kangaroo program. Presented at: Seminar on the Dream Clinic; Paris, France. 2025.
5. World Health Organization. Care of the preterm and low birth weight newborn. Geneva: WHO. 1998. UNICEF Morocco. Maternal and newborn health report. Rabat. 2001.
6. Ministry of Health Morocco. National neonatal health strategy. Rabat. 2009. Casablanca University Hospital. Neonatal services annual report. Casablanca. 2012.
7. UNICEF Morocco. Newborn care practices in Morocco. Rabat. 2016.

- Save the Children. Preterm birth and newborn survival. London. 2018.
8. Ropars S. Long-term impacts of the Kangaroo mother method on cognitive and attentional functioning of young adults with low birth weight [doctoral thesis]. Quebec: Laval University. 2015.
  9. Jefferies AL. The Kangaroo method for the premature infant and his family. *Paediatr Child Health*. 2012;17(3):144-6.
  10. Ratynski N, Minguy S, Kerleroux B. Developmental care for the premature newborn: nursing practice, prematurity and innovations in neonatology. *Soins PEDIATR Pueric*. 2017;299:1-6.
  11. Nehme R. Implementation of the Kangaroo mother care method in a university hospital in Beirut. Beirut: Saint Joseph University. 2020.
  12. Yattara AM. Characteristics of newborns readmitted after transfer to the Kangaroo unit of Gabriel Touré University Hospital [doctoral thesis]. Bamako: University of Sciences, Techniques and Technologies. 2021.
  13. Selangai KH, Nkwele MI, Puepi DY, Betoko MR, Zenabou T, Zekakom MP, Sap NUS. Knowledge and perceptions of the Kangaroo mother care method among mothers in a regional hospital in Cameroon. 2021.
  14. Vatelot L. Evaluation of the mother-child unit at Angers University Hospital: parent satisfaction survey (June-October 2010) [midwifery thesis]. Angers: University of Angers. 2011.
  15. Foong WC, Foong SC, Hoi JJ, Gautam D, Leong JJ, Tan PY, Baskaran M. Factors influencing the adoption of the Kangaroo mother care method: Interviews with key informants and parents. *BMC Pregnancy Childbirth*. 2023;23(1):706.
  16. Mohamed E, Ngo Niep Ebanda JR. The Kangaroo method in the prevention and treatment of pain in premature infants in neonatology: a literature review [bachelor's thesis]. Fribourg: University of Applied Sciences and Arts. 2015.
  17. Pierrat V, Bomy H, Courcel C, Dumur S, Caussette V, Bouckenhove N, et al. Skin-to-skin contact in the care of low birth weight newborns. *J Pediatr Child Care*. 2004;17:351-7.
  18. Athanasopoulou E, Fox JRE. Effects of Kangaroo mother care on maternal mood and parent-infant interaction in preterm, low birth weight infants: A systematic review. *Infant Ment Health J*. 2014;35(3):245-62.

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