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Kangaroo Mother Care: Its Effects on Neonates & Barriers to Practice in A Tertiary Level NICU

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Abstract

Background: Kangaroo Mother Care (KMC) is a low-cost, effective neonatal intervention involving continuous skin-to-skin contact and exclusive breastfeeding. It is particularly beneficial for preterm and low birth weight (LBW) infants, promoting thermal regulation, weight gain, bonding, and reducing neonatal morbidity and mortality.

Methods: A prospective observational study was conducted on 220 neonates admitted to a tertiary-level NICU. Of these, 176 neonates received KMC. Baseline characteristics were recorded. Neonatal outcomes including weight gain, length, head circumference, and hospital stay were assessed. Barriers to KMC were identified through caregiver interviews.

Results: Among the neonates, 80% received KMC and 50.56% received ≥8 hours/day. The KMC group demonstrated significantly greater weight gain after one week ($p = 0.03$). No significant differences were observed in length or head circumference. Major barriers included poor family support (38.63%), lack of trained staff (11.36%), and cesarean-related limitations (8.63%).

Conclusion: KMC effectively promotes early neonatal weight gain and stability. Addressing key barriers through education, infrastructure, and staff training is essential to improve its adoption and outcomes.

Keywords: Kangaroo Mother Care; Low Birth Weight; Preterm Infant; Skin-to-Skin Contact; NICU; Neonatal Outcome

Introduction

Kangaroo Mother Care (KMC) is an evidence-based, low-cost intervention involving continuous skin-to-skin contact between the mother and the newborn, with promotion of exclusive breastfeeding. Originally developed in Bogotá, Colombia in 1978 and endorsed by WHO in 2003, KMC has proven especially beneficial for preterm and low birth weight infants. It improves thermal regulation, supports weight gain, reduces hospital-acquired infections, strengthens emotional bonding, and decreases neonatal mortality.

Globally, preterm births and LBW contribute to over one million neonatal deaths annually. In countries like India, where resource constraints exist, the adoption of KMC offers an effective alternative to incubator care, especially in tertiary care settings. However, implementation faces multiple barriers such as insufficient infrastructure, cultural perceptions, lack of training, and poor family support.Despite

national guidelines and inclusion in programs like the Every Newborn Action Plan, KMC adoption remains limited. Studies show that only a minority of mothers practice KMC for more than 8–12 hours daily. Enhancing KMC practice requires understanding both its benefits and challenges in specific settings. This study aims to evaluate the effects of KMC on neonatal outcomes and to identify institutional and caregiver-level barriers hindering its optimal use in a tertiary care NICU.

Materials and Methods

This prospective observational study was conducted in the Neonatal Intensive Care Unit (NICU) of KD Medical College, Mathura. A total of 220 neonates admitted over a defined study period were included. Inclusion criteria were stable neonates with birth weight <2500 g, suitable for KMC. Neonates with congenital anomalies or requiring mechanical ventilation were excluded.

Data Collection: Baseline variables such as gestational age, sex, and birth weight were recorded. Of the 220 neonates, 176 received KMC. The duration of daily KMC, caregiver providing KMC, and outcome measures including weight gain, length, head circumference, and duration of hospital stay were noted.

Grouping: Participants were grouped into KMC and non-KMC groups. Outcomes were compared using appropriate statistical tests.

Barriers to KMC were assessed using structured interviews with caregivers, and responses were categorized.

Ethical Considerations: As this study was conducted as part of MD Paediatrics thesis work, formal ethics approval was not required.

Results

Among 220 neonates, 120 (54.5%) were male, and 100 (45.5%) were female. A total of 122 neonates (55.45%) were born at <32 weeks gestation, and 98 (44.55%) were ≥32 weeks. Regarding birth weight, 82 (37.27%) were <1500g and 138 (62.73%) were between 1500–2499g.

176 neonates (80%) received KMC, with 89 (50.56%) receiving ≥8 hours/day. Mothers provided KMC in 61.82% of cases, fathers in 10.91%, and other family members in 7.27%. A total of 44 neonates (20%) did not receive KMC due to various limitations.

Weight gain after 1 week was significantly higher in the KMC group ($p = 0.03$). No significant differences were found in head circumference or length. Hospital stay was slightly longer in the KMC group (mean 9.43 ± 4.35 days) than in the non-KMC group (8.90 ± 4.11 days), which was statistically significant ($p = 0.04$).

Barriers to KMC included poor family support (38.63%), lack of skilled staff (11.36%), cesarean-related issues (8.63%), early discharge (6.36%), lack of privacy (5.91%), and insufficient KMC beds (7.73%).

Discussion

This study reinforces the beneficial impact of Kangaroo Mother Care (KMC) on neonatal health, particularly among preterm and low birth weight infants. With an 80% adoption rate in the NICU, the findings indicate a growing awareness and institutional effort towards implementing KMC.The present study demonstrated significantly higher weight gain in neonates receiving KMC, particularly among those who received it for ≥8 hours daily. This aligns with previous studies such as Kalita et al. (2024) and Bhatt et al. (2021), which reported improved weight gain and physiological stability in neonates practicing KMC.No statistically significant improvement was noted in head circumference or length, which mirrors

other observational studies suggesting that while KMC primarily influences early weight gain, its effect on linear growth may take longer to manifest.

Contrary to expectations, the KMC group had a slightly longer hospital stay. This finding might reflect increased caution and closer monitoring of infants receiving KMC rather than any delay in stabilization.

Barriers to KMC identified in this study, including poor family support and lack of trained staff, are consistent with those reported by Seidman et al. (2015) and Lewis et al. (2019). Addressing these barriers requires targeted training of healthcare workers, improved infrastructure for privacy, and robust community engagement.

The active participation of fathers and family members in KMC—although limited—highlights the importance of expanding KMC responsibilities beyond mothers, especially in the case of postoperative recovery or early maternal discharge.

Conclusion

Kangaroo Mother Care is a simple yet effective intervention that promotes early weight gain, bonding, and physiological stability among neonates. Its implementation in this tertiary NICU showed high feasibility and significant clinical benefits. However, barriers such as family-related constraints and inadequate training continue to limit its universal practice. Institutional initiatives, caregiver education, and infrastructure improvements are critical for broader adoption and better neonatal outcomes.

Limitations

- Single-center study; findings may not be generalizable
- Short follow-up period; long-term outcomes were not measured
- Observational design limits causal inference
- Barriers reported by caregivers may have recall or social desirability bias

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