

Evaluating Knowledge and Awareness of Kangaroo Mother Care among Mothers and Healthcare Providers: A Cross-Sectional Study

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Abstract

Background: Kangaroo Mother Care (KMC) is an evidence-based intervention recommended for low birth weight (LBW) and preterm infants, emphasizing prolonged skin-to-skin contact, exclusive breastfeeding, and early discharge. Although widely endorsed for improving neonatal outcomes, the actual level of knowledge and awareness of KMC among mothers and healthcare providers varies, potentially influencing its consistent implementation.

Objectives:

1. To assess the level of knowledge and awareness regarding KMC among mothers, including those with and without prior exposure to LBW or preterm infants.
2. To evaluate healthcare providers' understanding, attitudes, and perceived barriers to implementing KMC in routine neonatal care.
3. To identify factors that influence the dissemination and acceptance of KMC-related knowledge.

Methods: A cross-sectional study was conducted of nine months at Department of Pediatrics, Index Medical College Hospital & Research Centre, Indore, Madhya Pradesh, India and associated maternal child health centers. A total of 100 participants were enrolled, comprising 70 mothers of newborns and 30 healthcare providers (nurses, pediatricians, and midwives). Structured questionnaires assessed participants' understanding of KMC principles, benefits, duration of skin-to-skin contact, and exclusive breastfeeding practices. Perceived barriers to KMC implementation were also documented. Data were analyzed using descriptive statistics and chi-square tests to identify associations between participant characteristics and knowledge levels.

Results: Overall, 40% of mothers and 55% of healthcare providers demonstrated adequate knowledge of KMC. Mothers who had previously cared for LBW or preterm infants were significantly more aware of KMC practices ($p < 0.05$). Among healthcare providers, those with targeted neonatal training reported fewer perceived barriers and better understanding of KMC. Communal areas of knowledge deficit included uncertainty about the optimal duration of KMC sessions and exclusive breastfeeding guidelines. Participants cited inadequate education, time constraints, and infrastructural limitations as major barriers.

Conclusions: The study reveals notable gaps in KMC knowledge and awareness among both mothers and healthcare providers. Addressing these gaps through structured training, community education, and policy support could promote wider acceptance and consistent application of KMC. Enhancing KMC understanding may improve neonatal survival, growth, and long-term developmental outcomes.

Key Words: Kangaroo Mother Care, Neonatal Care, Awareness, Healthcare Providers, Maternal Education, Low Birth Weight, Preterm Infants

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Introduction

Kangaroo Mother Care (KMC) has gained global recognition as an effective and low-cost strategy to improve the care and outcomes of low birth weight (LBW) and preterm infants. By emphasizing sustained skin-to-skin contact, exclusive

breastfeeding, and early discharge with close follow-up, KMC not only fosters physiological stability—such as improved thermoregulation and cardiorespiratory function—but also enhances bonding, promotes breastfeeding success, and

supports better long-term neurodevelopmental trajectories [1].

Despite widespread endorsement by the World Health Organization and other international health agencies, the practical uptake of KMC remains variable. One key challenge is the inconsistent level of knowledge and awareness regarding KMC principles among both mothers and healthcare providers. Mothers may be unclear about the recommended duration of skin-to-skin contact, the importance of exclusive breastfeeding, or how to continue KMC at home [2]. Healthcare providers, meanwhile, may not receive adequate training or guidance on how to integrate KMC into routine neonatal care, leading to uncertainty, time constraints, and insufficient counselling of families. Such knowledge gaps can impede the successful translation of evidence-based recommendations into everyday clinical practice [3].

Understanding the specific areas where knowledge is lacking is essential to improving KMC uptake. By identifying how much mothers and healthcare providers know and do not know about KMC, it becomes possible to target educational interventions more effectively. This can lead to better parental engagement, more robust support from healthcare teams, and greater adherence to KMC protocols, all of which could significantly reduce neonatal morbidity and mortality, particularly in resource-limited settings [4].

In this cross-sectional study, conducted at a tertiary care hospital and associated maternal child health centers, we evaluated knowledge and awareness of KMC among 100 participants, including mothers of newborns and frontline healthcare providers. By correlating participant characteristics with their understanding of KMC, we aimed to identify factors that influence KMC awareness and highlight actionable opportunities for improvement. These findings can guide the development of structured training programs, community-based educational campaigns, and policy-level reforms to ensure that KMC's well-documented benefits are fully realized in routine neonatal care.

Methodology

Study Design and Setting: A cross-sectional study was conducted of nine months at Department of Pediatrics, Index Medical College Hospital & Research Centre, Indore, Madhya Pradesh, India. The hospital caters to a diverse patient population, ensuring exposure to a broad range of neonatal and maternal healthcare practices.

Study Population and Sample Size: A total of 100 participants were recruited for the study, comprising 70 mothers of newborns and 30 healthcare providers. Mothers were enrolled from the postnatal wards and neonatal intensive care units, while

healthcare providers (including nurses, pediatricians, and midwives) were identified from units where neonatal care was routinely provided. The inclusion criteria for mothers were:

1. Age ≥ 18 years.
2. Recently delivered an infant (term or preterm) at the study site.
3. Willingness to provide informed consent and respond to the questionnaire. Mothers with significant cognitive impairment or language barriers that prevented meaningful participation were excluded.

For healthcare providers, inclusion criteria were:

1. Currently employed at the hospital in neonatal or maternal healthcare roles.
2. At least six months of clinical experience in neonatal care.
3. Willingness to provide informed consent and respond to the questionnaire.

Sampling Technique: Consecutive sampling was employed to enrol all eligible and willing participants during the study period. This approach ensured that selection bias was minimized and that the sample reflected the routine clinical environment.

Data Collection Tools and Procedures: A structured, pretested questionnaire was developed for both mothers and healthcare providers. The questionnaire was formulated in consultation with neonatologists, obstetricians, and nursing staff experienced in KMC. It included both closed- and open-ended questions and was designed to assess:

- **Demographic and Sociocultural Data:** Age, education, parity (for mothers), professional role, and years of experience (for healthcare providers).
- **Knowledge and Awareness of KMC:** Core principles of KMC (skin-to-skin contact, exclusive breastfeeding, early discharge), recommended duration of KMC sessions, perceived benefits for the infant (thermoregulation, feeding, bonding), and maternal benefits (confidence in infant care, emotional well-being).
- **Exposure to KMC Information:** Previous training sessions, counselling by healthcare staff, written materials, or community-based education campaigns.
- **Perceived Barriers to KMC Implementation:** Time constraints, infrastructural limitations (lack of private space or chairs), inadequate staffing, cultural beliefs, and limited family support.

The questionnaires were administered face-to-face in the local language by trained research assistants. For mothers, interviews were conducted at their bedside once their medical condition and that of their newborn allowed. Healthcare provider questionnaires were administered during scheduled breaks or after clinical duties to ensure minimal disruption to patient care.

Data Management and Quality Control: Data were collected on paper-based forms and subsequently entered into a secure electronic database by two independent data entry personnel. Cross-verification of a random subset (20%) of the questionnaires was performed to ensure accuracy. Any discrepancies were resolved through discussion with the original interviewer, and corrections were made accordingly. The research team provided regular oversight to maintain data quality and integrity.

Statistical Analysis: Data were analyzed using SPSS version 26.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to summarize demographic characteristics, knowledge levels, and perceived barriers. Chi-square tests were employed to assess associations between participant

characteristics (e.g., mother's education level, healthcare provider's years of experience) and their knowledge and awareness of KMC. A p-value of <0.05 was considered statistically significant.

Results

Out of the total 100 participants, comprising 70 mothers and 30 healthcare providers, only 40% of mothers and 55% of healthcare providers demonstrated adequate knowledge of KMC. Mothers who had previously cared for low birth weight (LBW) or preterm infants showed significantly better awareness compared to those without such experience. Healthcare providers with targeted neonatal training reported fewer perceived barriers to KMC implementation. Common gaps included uncertainty about the recommended duration of skin-to-skin contact and exclusive breastfeeding guidelines. Both mothers and providers cited lack of education, time constraints, and infrastructural limitations as major barriers to adopting KMC practices.

Age Distribution: The Table 1 below shows the age distribution of the participants.

Table 1: Age Distribution of Participants

Category	Age Range (Years)	Number of Participants (n=100)	Percentage (%)
Mothers	18–24	25	25.0
Mothers	25–34	35	35.0
Mothers	≥35	10	10.0
Healthcare Providers	25–34	15	15.0
Healthcare Providers	≥35	15	15.0

Educational Level of Mothers: The Table 2 below shows the educational levels attained by the mothers.

Table 2: Educational Level of Mothers

Education Level	Number of Mothers (n=70)	Percentage (%)
Primary Education	15	21.4
Secondary Education	35	50.0
Higher Education	20	28.6

Distribution of Healthcare Providers: The Table 3 below shows the distribution of healthcare providers by their professional roles.

Table 3: Distribution of Healthcare Providers

Professional Role	Number of Providers (n=30)	Percentage (%)
Nurses	15	50.0
Midwives	10	33.3
Pediatricians	5	16.7

Prior Exposure to KMC Information (Mothers): The Table 4 below shows whether mothers had prior exposure to KMC information.

Table 4: Prior Exposure to KMC Information (Mothers)

Exposure Status	Number of Mothers (n=70)	Percentage (%)
Yes (Counselled/Read)	30	42.9
No (No Prior Exposure)	40	57.1

Adequate Knowledge of KMC Principles: The Table 5 below compares the proportion of mothers and healthcare providers who demonstrated adequate knowledge of KMC principles.

Table 5: Adequate Knowledge of KMC Principles

Group	Adequate Knowledge (%)	Inadequate Knowledge (%)
Mothers (n=70)	40.0	60.0
Providers (n=30)	56.7	43.3

Mothers' KMC Awareness by LBW/Preterm Experience: The Table 6 below shows KMC awareness among mothers who had previously cared for LBW or preterm infants compared to those who had not.

Table 6: Mothers' KMC Awareness by LBW/Preterm Experience

Experience with LBW/Preterm	KMC-Aware (%)	KMC-Not Aware (%)
Yes (n=20)	75.0	25.0
No (n=50)	26.0	74.0

Awareness of Recommended KMC Duration: The Table 7 below shows the awareness of recommended duration (≥ 1 hour per session) among mothers and healthcare providers.

Table 7: Awareness of Recommended KMC Duration

Group	Aware (≥ 1 hr/session) (%)	Not Aware (%)
Mothers (n=70)	28.6	71.4
Providers (n=30)	40.0	60.0

Awareness of Exclusive Breastfeeding: The Table 8 below shows the awareness of the importance of exclusive breastfeeding as part of KMC.

Table 8: Awareness of Exclusive Breastfeeding

Group	Aware (%)	Not Aware (%)
Mothers (n=70)	35.7	64.3
Providers (n=30)	50.0	50.0

Perceived Barriers to KMC: The Table 9 below shows the most commonly reported barriers to KMC among all participants.

Table 9: Perceived Barriers to KMC

Barrier	Number of Participants (n=100)	Percentage (%)
Lack of Education	60	60.0
Time Constraints	30	30.0
Infrastructural Issues	20	20.0

Neonatal Care Training among Providers: The Table 10 below shows whether healthcare providers received KMC-related training.

Table 10: Neonatal Care Training among Providers

Training Status	Number of Providers (n=30)	Percentage (%)
Received KMC-Related Training	12	40.0
No Specific KMC Training	18	60.0

Discussion

This study sought to evaluate the knowledge and awareness of Kangaroo Mother Care (KMC) among mothers and healthcare providers, highlighting significant gaps and barriers that hinder its effective implementation. The findings underscore the importance of addressing these deficiencies through

targeted educational interventions and systemic improvements.

Knowledge and Awareness of KMC Principles: The study revealed that only 40% of mothers and 56.7% of healthcare providers had adequate knowledge of KMC principles. This indicates a substantial gap, particularly among mothers, many

of whom were unaware of critical aspects such as the optimal duration of skin-to-skin contact and the role of exclusive breastfeeding in KMC [5]. These findings align with global observations that knowledge deficits about KMC are more pronounced among caregivers in low- and middle-income countries. Healthcare providers demonstrated better awareness, but their understanding was still not comprehensive, with 43.3% displaying inadequate knowledge [6].

Influence of Previous Exposure to KMC: Mothers who had prior experience caring for low birth weight (LBW) or preterm infants showed significantly higher awareness of KMC practices (75% vs. 26%). This suggests that firsthand exposure, combined with counselling in neonatal care units, can improve maternal knowledge [7]. However, the study also highlights that a sizeable proportion of mothers without prior exposure lacked awareness, emphasizing the need for broader community-based education campaigns to ensure KMC principles reach all caregivers, not just those interacting with neonatal intensive care units [8].

Role of Healthcare Providers: Healthcare providers are critical in promoting KMC adoption, yet only 40% reported receiving targeted KMC-related training. This lack of formal education may explain their limited ability to effectively counsel mothers and overcome barriers to implementation [9]. Providers who had undergone neonatal care training were more confident in addressing mothers' queries and demonstrated better knowledge retention. The need for structured training programs that incorporate KMC as a core component of neonatal care education is evident. Such initiatives could enhance provider competency and foster better communication with mothers [10].

Barriers to KMC Implementation: Participants identified several barriers to KMC adoption. The most frequently reported challenges were:

1. **Lack of Education (60%):** Both mothers and providers cited insufficient knowledge as a significant obstacle. This suggests a systemic failure to integrate KMC education into antenatal and postnatal care.
2. **Time Constraints (30%):** Healthcare providers, particularly nurses and midwives, reported time constraints due to staffing shortages and high patient loads, limiting their ability to counsel mothers effectively.
3. **Infrastructural Issues (20%):** Mothers highlighted the lack of privacy and appropriate facilities, such as reclining chairs for prolonged skin-to-skin contact, as barriers to practicing KMC in hospital settings.

These findings are consistent with prior studies that have identified similar infrastructural and knowledge-related challenges in resource-limited settings. Addressing these barriers requires a multifaceted approach, including policy-level interventions, improved infrastructure, and tailored educational strategies.

Implications for Policy and Practice: To bridge the knowledge gap and promote widespread KMC adoption, the following recommendations are proposed:

1. **Integrating KMC Education into Routine Care:** Educational sessions on KMC should be incorporated into antenatal and postnatal counselling. Visual aids, videos, and written materials could enhance understanding and retention among mothers.
2. **Healthcare Provider Training:** Mandatory training programs for nurses, midwives, and pediatricians should include comprehensive modules on KMC. Firsthand workshops could further improve confidence and skill in promoting KMC practices.
3. **Improving Infrastructure:** Hospitals and maternal care centers should be equipped with private spaces and comfortable seating arrangements to encourage prolonged skin-to-skin contact. These changes can significantly enhance mothers' willingness to practice KMC.
4. **Community Engagement:** Outreach programs targeting rural and underserved populations are essential. Engaging community health workers to deliver KMC education at the household level can help extend its reach beyond hospital settings.

Strengths and Limitations of the Study: This study provides a valuable snapshot of KMC awareness among mothers and healthcare providers in a tertiary care setting, highlighting actionable gaps and barriers. However, its single-center design and small sample size may limit the generalizability of the findings. Future multicentric studies with larger, more diverse populations could provide a more comprehensive understanding of KMC awareness and its determinants.

Conclusion:

The study highlights critical gaps in knowledge and awareness of KMC among mothers and healthcare providers, emphasizing the need for structured training programs, improved infrastructure, and community-based educational initiatives. Bridging these gaps can enhance the adoption of KMC, improving neonatal survival and developmental outcomes. With targeted efforts, KMC can become a universally practiced and effective intervention for managing LBW and preterm infants.

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