Original Article

Post-discharge home kangaroo mother care follow-up study in rural Gujarat

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Abstract

Background: Continuation of kangaroo mother care (KMC) at home is vital for improved infant survival and development. Hence, it is essential to understand potential enablers and barriers to home KMC provision. **Methodology:** This observational study was conducted in rural Gujarat. KMC was initiated for all low-birth-weight (LBW) neonates during the hospital stay and were advised to continue home KMC on discharge. The mothers of these LBW neonates were interviewed using a structured questionnaire during follow-up visits or via telephone. **Results**: A total of 100 mothers were interviewed, and 98 practiced home KMC. Mothers' mean age was 24.41 (±3.1) years, and infants' mean age was 3.48 (±1.81) months. The mean weight of neonates at discharge was 1.85 (±0.28) kg. Out of the 104 neonates (96 singleton pregnancies and four twins), 76 (73.07%) were pre-term. 31% mothers provided 4–6 hours of daily KMC. 60% provided KMC for less than 1 hour during each session, while 36% of mothers provided each KMC session for 1–3 hours. 74% of mothers received family support, and 62% faced difficulties in home KMC provision. 88% of mothers were homemakers, and 53% had other children to care for. 51% mothers pre-maturely discontinued KMC provision. 83% of the mothers reported fatigue or pain during KMC provision. **Conclusion:** Lack of family support, other household responsibilities, and other children to care for were major barriers leading to pre-mature discontinuation of home KMC.

Keywords: Community KMC, home KMC, kangaroo mother care, low birth weight, neonatology, pre-maturity

Introduction

Kangaroo mother care (KMC) is a low-resource, evidence-based, high-impact intervention and standardized care for low-birth-weight infants, which should be part of routine care.[1] KMC is a beneficial tool in reducing neonatal mortality along with long-term neurodevelopmental benefits. The mortality risk is reduced by 40% in neonates with birth weight <2000 grams if they receive KMC, compared with infants solely cared for in an incubator or radiant warmer, the current standard of care for thermal support of pre-term newborns.[2,3] The benefits of KMC also include physiologic thermoregulation, improved breastfeeding, adequate weight gain, positive mother–infant attachment, and bonding with a reduction in neonatal infections.[3-6]

The global Every Newborn Action Plan has set a target of 90% KMC coverage by 2030 for infants who weigh <2000 grams.[7] Though efforts have been made toward scaling up KMC in some developing country settings, the worldwide coverage of KMC still needs to improve in neonatal intensive care units (NICUs) and at the community level.[2,8-12]

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Mothers often face a variety of barriers that prevent the provision of continuous KMC to their babies. Studies have shown that the most common obstacles to KMC that negatively impact KMC provision include issues with the environment/resources, lack of help for KMC practice and other obligations, lack of proper training/guidelines, lack of privacy, lack of motivation, and others.[13,14]

It is important to understand these socio-cultural barriers to implement community KMC effectively. Hence, this KMC follow-up study was undertaken to measure the prevalence of home KMC, understand the experiences of mothers/other caregivers providing KMC, and acknowledge potential KMC barriers.

Methodology

This observational study was conducted in Gujarat in a rural province. The study included neonates admitted to the NICU or KMC ward of a tertiary care hospital affiliated with a teaching institute in Gujarat from January 2016 to October 2016. The study was conducted after the Institutional Ethics Committee (IEC) approval. The neonates with stable vitals who weighed less than 2500 g were initiated into KMC during the hospital stay per the unit protocols. The gestational age assessment was based on the New Ballard Score, maternal records, and USG findings. Mothers and other caregivers were educated and encouraged regarding the provision of KMC. Trained nurses provided continuous supervision and motivated the mothers to use KMC provisions during their hospital stay. To increase awareness about the benefits of KMC, various posters were placed in the postnatal ward, KMC, and step-down wards. In addition, groups of mothers were shown videos in their vernacular language to improve KMC provision. Mothers and other family members of low-birth-weight (LBW) neonates were advised to continue home KMC during discharge. The mothers were motivated to continue home KMC at every follow-up visit until the infant weighs at least 2500 g. At the subsequent primary vaccination visits, the mothers were interviewed using a structured questionnaire in the local vernacular language for better understanding after prior consent. The questionnaire included questions regarding the duration of KMC provision and other questions about enablers and barriers to KMC provision. For those neonates who did not follow up at our institute, their family members were contacted, and home visits were arranged. The post-graduate residents and neonatology fellows conducted the interviews.

Statistical analysis

Descriptive statistics [mean (SD), frequency (%)] were used to depict the baseline characteristics of the study population. The responses of mothers to the feasibility questionnaire were reported in proportions. STATA 14.2 (Stata Corp, College Station, TX, USA) was used for statistical analysis.

Results

Figure 1 shows the study flowchart.

One hundred mothers with neonates having a birth weight and weight at discharge ≤ 2500 grams were interviewed regarding KMC practices at home using a structured questionnaire during either hospital follow-up visits or home visits. During the survey, the mean age of mothers interviewed was 24.41 (±3.1) years, and that of the infants was 3.48 (±1.81) months, as shown in Table 1. The mean weight of the neonates at discharge was 1.85 (±0.28) kg. Out of the 104 neonates (96 singleton pregnancies and four twins), 76 (73.07%) were pre-term.

The most commonly observed reason for admission was transient tachypnea of newborn (TTNB), followed by respiratory distress syndrome (RDS). Other reasons included perinatal asphyxia, VLBW, pre-maturity, apnea of pre-maturity, neonatal jaundice, neonatal hypoglycemia, neonatal seizures, and congenital malformations.

Table 2 shows the recorded maternal responses regarding the home KMC practices. We observed that KMC was advised to 99% of mothers during discharge, while 98% practiced KMC at home. Most mothers (66%) provided <4 KMC sessions in a day, followed by 31% who provided 4–6 sessions of daily KMC. The majority of the study population (60%) provided KMC less than 1 hour during each KMC session, while 36% of mothers provided each KMC session of 1–3 hours duration. Other family

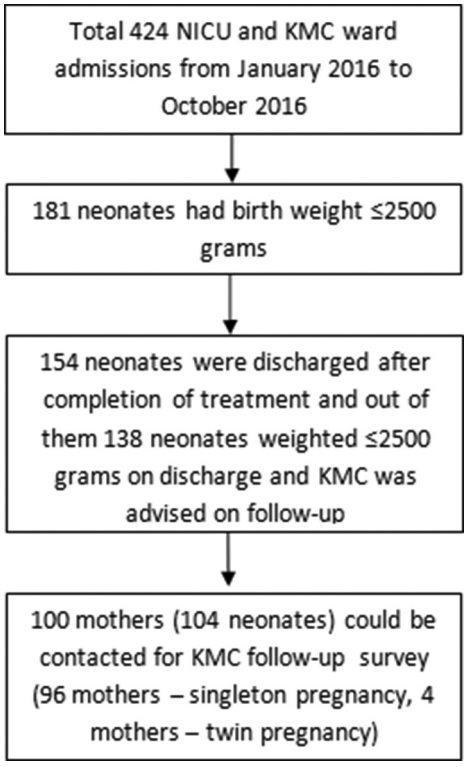

Figure 1: Study flowchart

Table 1: Demographic details of the study population

Variable	Number (N)	Mean (SD)
Age of mother (years)	100	24.41 (3.105)
Age of baby (months)	104	3.48 (1.812)
Weight at discharge	104	1.85 (0.28)

Table 2: Maternal responses to the questionnaire regarding KMC provision

Sr no.	Questions (N=100)	Responses	Frequency/ Percentage
1.	Was KMC advised during discharge?	Yes	99
		No	1
2.	Was KMC practiced at home?	Yes	98
		No	2
3.	Number of times KMC was provided in a day	0	2
		<4	66
		4-6	31
		>6	1
4.	Number of hours for a single "KMC session	0	2
		<1	60
		1-3	36
		>3	2
5.	Were other family members involved in KMC provision?	No	34
		Yes	66
6.	Did the family support the mother for KMC provision?	No	26
		Yes	74
7.	Was house help available to help out with household chores?	No	57
		Yes	43
8.	Did the mother face any difficulties with KMC provision?	No	38
		Yes	62
9.	Did the mother pre-maturely discontinue KMC without a doctor's consultation?	No	49
		Yes	51

members were involved in KMC provision for 66% of mothers, and 74% received family support for KMC provision. House help was unavailable for most mothers (57%) for other household chores. 62% of mothers faced difficulties in KMC provision, and 51% pre-maturely discontinued home KMC practice.

Table 3 shows the maternal responses to the questionnaire for identifying potential barriers and facilitators for home KMC provision. 98% of mothers and family members were explained about and demonstrated KMC during their hospital stay by personal demonstration, videos, or charts. 92% of mothers were motivated to continue KMC during follow-up visits in the OPD. Most mothers (88%) were homemakers, and only 12% worked, out of which five mothers were daily wage workers. Four mothers gave birth to twins and faced difficulty providing KMC to both babies. 83% of mothers experienced fatigue/pain during KMC provision. Forty-seven mothers had other children to care for. 93% of mothers provided exclusive mother's own milk (MOM), while 7% provided mixed feeding to their infants. The majority (90%) of mothers exclusively breastfed their infants. 58% of mothers fed their neonates > 8 times per day, and 99% practiced night feeding. Ninety-nine mothers followed up in the

Table 3: Maternal responses to the questionnaire to identify potential barriers and facilitators for KMC provision

Sr no.	Questions (N=100)	Responses	Frequency/ Percentage
1.	Were the mother/family members explained and demonstrated KMC provision during the hospital stay?	Yes	98
		No	2
2.	Was the mother/family member motivated to continue home KMC provision during follow-up visits?	Yes	92
		No	8
3.	Did the mother work?	Yes	12
		No	88
4.	Was the mother a daily wage worker?	Yes	5
		No	95
5.	Did the mother face difficulties in providing KMC to twins?	Yes	4
		No	96
6.	Did the mother experience fatigue or pain during KMC provision?	No	17
		Yes	83
7.	Other children to care for	Yes	47
		No	53
8.	Did the mothers provide exclusive MOM to the infants?	Yes	93
		No	7
9.	Method of feeding MOM to the infant	Exclusive breast feeding	90
		Katori or spoon feeding	1
		Both	9
10.	Frequency of breastfeeding in a day	<8 times	42
		>8 times	58
11.	Did the mothers breastfeed at night?	Yes	99
		No	1
12.	Did the parents follow up at OPD of the same institute?	Yes	99
		No	1
13.	Were the infants immunized appropriately according to age?	Yes	104
		No	0

OPD of the same institute, and 100% of infants were immunized according to age.

Discussion

We observed that KMC implementation was conducted in 99% of the eligible neonates at the time of hospital discharge, home KMC was continued by 98% of mothers during the neonatal period, and 51% of mothers pre-maturely discontinued KMC provision. Kumar A. *et al.* (2022) conducted a study to design a health system for scaling up KMC in Uttar Pradesh. They observed that KMC was initiated in 93.3% of eligible infants with effective coverages of 52.7% and 64.8% at discharge and 7 days post discharge, respectively.[2] A similar study was conducted in South India. They observed that KMC was initiated at health facilities for 87.6% of LBW babies under 2000 g, and 85.0% received KMC at discharge, while 67.9% continued to receive KMC at home on the 7th day post discharge.[4] A study conducted in North India to achieve effective KMC coverage showed that

KMC was initiated in 87% of eligible babies, continued in 85% at discharge, and in 81% of babies on the 7th post-discharge day.[15] Another study conducted in Ethiopia showed the effective KMC coverage to be 54% at discharge with 38% on the 7th day post discharge.[16]

A study conducted in Ghana to evaluate mother's perceptions, attitudes, and practices of KMC showed that out of 202 mothers, 99.5% of mothers practiced intermittent or continuous KMC during the follow-up visit 1 week post discharge, and 94.3% practiced KMC at the end of 4 weeks. The practice of providing night KMC and KMC outside the home improved from 87.9% to 91.7% and from 58.2% to 90.4%, respectively, during 4-week follow-up visits.[17]

During the study, we observed that KMC demonstration and emphasis on KMC provision at discharge motivation for continuing home KMC during follow-up visits, family support for KMC provision, and other household chores were potent facilitators for home KMC practice. However, the responsibility of other children, twin babies, lack of help for household chores, and lack of family support were possible barriers to effective home KMC provision. A study conducted in New Delhi to identify factors impacting home KMC reported that 13.2% discontinued KMC 4 weeks post discharge. The top two enablers were determined to be family help with household responsibilities and other family members providing KMC. At the same time, lack of privacy and motivation were the top two barriers to effective KMC.[14] A similar study by Raajashri R. *et al.* showed that out of 200 mothers interviewed to evaluate home KMC practices, 82.5% continued home KMC after discharge and support of family members was facilitatory in 70% and lack of privacy at home was hindering in 25%.[18] A recent study using a temperature monitor for discharged newborns showed that using this device in the first month improved KMC rates at home.[19]

Home KMC practices can be improved with KMC demonstration, motivation, and proper advice during hospital stays, discharge, and follow-up visits. Family support in KMC provision and other household responsibilities can help improve home KMC practice, while barriers like lack of help and support for chores and caring for other children can lead to pre-mature discontinuation of home KMC. Increased awareness and community and family involvement are essential for KMC implementation in society and, thus, improvement in infant survival and development.

Involving family practice doctors and general practitioners is important to ensure improved KMC at home. Parents, once discharged, go back into the community, and they approach local practitioners with whom they have confidence.[20] However, a recent study showed that general practitioners need better knowledge of KMC; hence, they could not support KMC at home.[21] General practitioners contribute to the health of their community, and this lack of knowledge will have an important bearing on the ability to support continued KMC at home. Involving general practitioners as KMC champions needs to be tested as a strategy to improve home KMC.

Unlike most other studies conducted in large cities, the current study was conducted in a rural province of Gujarat. Hence, it is more representative of the general population than urban studies in India. In addition, the study helped identify barriers and enablers to home KMC provision and can be used to design interventions for improving KMC implementation.

We are limited by a small sample size (N = 100), but it is unlikely that a study with a larger sample size will change our understanding as this is a finding we encounter in clinical practice. However, large, multi-institutional studies across India would help confirm the current studies' findings.

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Conflicts of interest

There are no conflicts of interest.

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