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COMPARISON OF KANGAROO MOTHER CARE (KMC) IN HOSPITAL AND POST DISCHARGE: ENABLERS AND INHIBITORS

Original Research

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ABSTRACT

Background: Kangaroo Mother Care (KMC), involving skin-to-skin contact and exclusive breastfeeding, is a cost-effective and evidence-based strategy to improve survival and health outcomes among low-birth-weight (LBW) and preterm neonates. While hospitals provide a structured environment to initiate KMC, continuity at home plays a vital role in long-term adherence. However, enablers and inhibitors influencing KMC vary significantly across care settings. Identifying these factors is essential to optimize its practice both in clinical and community environments.

Objective: To compare the enablers and inhibitors of Kangaroo Mother Care (KMC) implementation in hospital and post-discharge home settings to improve neonatal care outcomes.

Methods: This prospective observational study was conducted in the Department of Neonatal Medicine at Services Hospital, Lahore, from January 2024 to August 2024. A total of 200 mothers of LBW neonates (<2.5 kg) practicing KMC were enrolled—100 during hospital stay and 100 at home post-discharge. Data were collected using a structured questionnaire assessing enablers and inhibitors, along with demographic and clinical details. Analysis was performed using SPSS version 27, applying descriptive and inferential statistics including independent t-tests.

Results: The mean maternal age was 28.4 ± 4.6 years; 162 (81%) neonates were preterm and 38 (19%) were full-term. The mean gestational age was 34.8 ± 1.99 weeks, and the average birth weight was 1.76 ± 0.34 kg. The mean enabler score was significantly higher at home (77.75 ± 4.33) compared to hospital settings (69.1 ± 10.3, P = 0.047). Conversely, the mean inhibitor score was significantly higher in hospitals (30.8 ± 10.3) than at home (22.2 ± 4.33, P = 0.045).

Conclusion: Home settings offer a more supportive environment for KMC, with significantly greater enablers and fewer inhibitors compared to hospital settings. Strengthening post-discharge support and minimizing hospital-related barriers are critical for sustaining KMC practices.

Keywords: Breastfeeding, Home Care Services, Infant, Low Birth Weight, Kangaroo-Mother Care Method, Neonatal Care, Skin-to-Skin Contact.

INTRODUCTION

Premature birth affects an estimated 15 million newborns annually and remains a major global health concern, contributing to over one million deaths each year. Alarmingly, complications arising from prematurity account for approximately 35% of all neonatal deaths worldwide (1). Among the many strategies explored to combat this critical issue, Kangaroo Mother Care (KMC)—a practice that involves exclusive breastfeeding and continuous skin-to-skin contact—has emerged as a highly effective, evidence-based intervention for reducing mortality and improving outcomes in low birth weight (LBW) infants. The benefits of KMC extend beyond survival, influencing a spectrum of physical, behavioral, and psychosocial parameters in both the short and long term (2,3). Despite its proven efficacy, the widespread implementation of KMC faces several challenges. At the individual level, medical complications, time constraints, limited family support, and sociocultural acceptance pose significant barriers to consistent practice. From a broader health system perspective, gaps in service delivery, organizational limitations, and financing issues further restrict KMC accessibility and continuity (4). Cultural norms also play a crucial role in shaping parental attitudes and behaviors toward KMC, ultimately influencing its acceptance and sustainability.

Recognizing the life-saving potential of KMC, the World Health Assembly introduced the "Every Newborn Action Plan," with a global target to provide KMC to 75% of newborns weighing less than 2000 grams by 2025 (5). Supporting this vision, recent literature has reaffirmed KMC's effectiveness as a low-cost, equipment-free intervention capable of reducing neonatal mortality, improving breastfeeding outcomes, and promoting maternal-infant bonding (6,7). Additional evidence highlights its physiological benefits, such as reduction in apnea, enhanced oxygenation, improved latching, increased milk production, and reduced neonatal stress, all of which positively influence neurodevelopmental trajectories (8). However, a major shift occurs in the transition from hospital-based KMC—where trained healthcare professionals offer structured support—to post-discharge care at home, which relies heavily on familial resources, socioeconomic stability, and cultural frameworks. This shift may compromise the quality and consistency of care due to insufficient support mechanisms outside the clinical setting (9). Given these disparities, it becomes imperative to explore the dynamic interplay of enabling and inhibiting factors that influence KMC implementation across hospital and home environments. This study, therefore, aims to compare the facilitators and barriers associated with KMC practice in institutional versus domestic settings, with the objective of identifying context-specific strategies to optimize continuity of care for vulnerable neonates.

METHODS

This prospective observational study was carried out in the Department of Neonatal Medicine at Services Hospital, Lahore, from January 2024 to August 2024. The study enrolled 200 neonates to investigate the enablers and inhibitors of Kangaroo Mother Care (KMC) in both hospital and home settings. The study population consisted of low-birth-weight neonates (birth weight <2.5 kg), both term and preterm, whose mothers practiced KMC during hospitalization. To gain a broader understanding of the influencing factors, healthcare providers and family members who supported KMC practices were also included. Participants were recruited using purposive sampling. Inclusion criteria comprised neonates with birth weight under 2.5 kg who were clinically stable and eligible for KMC, and mothers who agreed to continue KMC at home. Neonates with congenital anomalies, severe medical conditions requiring intensive care, or whose parents declined participation were excluded. Ethical approval was obtained from the Institutional Review Board of Services Institute of Medical Sciences, Lahore (IRB/2025/1527/SIMS). Written informed consent was obtained from all participants, and confidentiality and anonymity were ensured. Participants were informed of their right to withdraw from the study at any time without facing any consequences.

Data collection involved a structured, pre-validated questionnaire designed to assess barriers and facilitators of KMC. The questionnaire captured demographic information, including maternal age, neonatal gender, gestational age, and birth weight, as well as detailed questions exploring medical, social, cultural, and logistical factors that influenced KMC practice. Two primary settings were defined: (1) the hospital setting, where mothers practiced KMC in the established unit at Services Hospital, and (2) the home setting, where mothers continued KMC after discharge. For home-setting participants, data were collected through structured telephonic interviews to ensure accessibility and to minimize loss to follow-up. This approach allowed the researchers to reach participants regardless of

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geographic or transportation constraints. It also minimized the potential recall bias by ensuring timely follow-up soon after discharge, although it inherently lacked the observational depth of in-person visits. All data were entered and analyzed using the Statistical Package for Social Sciences (SPSS), version 27. Descriptive statistics summarized demographic and clinical data. Comparative analyses, including independent t-tests, were conducted to assess statistically significant differences in perceived support and challenges experienced during hospital-based versus home-based KMC. This multi-perspective and dual-setting methodology aimed to generate a well-rounded understanding of the factors affecting KMC adoption and continuity. The inclusion of telephonic interviews for post-discharge participants enhanced the study's feasibility and follow-up reliability, while acknowledging some inherent limitations in observational depth.

RESULTS

A total of 200 mothers of low-birth-weight (LBW) neonates participated in the study, with 100 mothers practicing Kangaroo Mother Care (KMC) in the hospital and 100 continuing the practice at home post-discharge. The mean age of participating mothers was 28.4 years (SD = 4.6), and the majority, 156 (78%), resided in urban areas. The neonates had a mean gestational age of 34.8 weeks (SD = 1.99), ranging from 30 to 39 weeks. Most neonates, 162 (81%), were delivered preterm (<37 weeks), while 38 (19%) were full-term (>37 weeks). The average birth weight recorded was 1.76 kg (SD = 0.34). Family participants providing support were primarily grandmothers and aunts, accounting for 18 (9%) of the supportive roles. Analysis of enablers revealed that mothers practicing KMC at home reported significantly higher support in several domains compared to those in the hospital. These included more comfortable seating (77 vs. 60), greater emotional support (80 vs. 70), and enhanced knowledge about KMC benefits (76 vs. 57). However, family member assistance was slightly higher in hospital settings (85 vs. 75), and proper breastfeeding support was similar across both groups (77 vs. 74). The overall mean enabler score was significantly higher in the home setting at 77.75 (SD = 4.33) compared to 69.1 (SD = 10.3) in the hospital setting (P = 0.047). In contrast, analysis of inhibitors indicated a higher prevalence of barriers in the hospital environment. Noise or distractions (40 vs. 23), misinformation about KMC (43 vs. 24), uncomfortable clothing (32 vs. 21), and lack of essential KMC items (22 vs. 13) were more frequently reported in the hospital group. The mean inhibitor score was significantly higher among hospital-based participants at 30.8 (SD = 10.3) compared to 22.2 (SD = 4.33) among those at home (P = 0.045).

These findings highlight that while hospital settings provide clinical safety, they pose more environmental and informational barriers to KMC practice. In contrast, the home environment appears more supportive, with fewer obstacles and stronger enabling factors favoring the continuity and sustainability of KMC. Subgroup analysis revealed additional insights into how demographic and clinical characteristics influenced the experiences of KMC enablers and inhibitors. Mothers aged ≤30 years demonstrated a significantly higher enabler score at home (mean = 78.3) compared to hospital (mean = 68.2, P = 0.041), with a corresponding lower inhibitor score at home (mean = 21.8) than in hospital (mean = 31.2, P = 0.039). Similarly, participants residing in urban areas showed a marked improvement in enabler scores post-discharge (78.2 vs. 69.5, P = 0.038), with fewer inhibitors reported at home (21.9 vs. 30.6, P = 0.036). Mothers of preterm neonates also benefitted more from home-based KMC, with higher enabler means (77.9 vs. 68.7, P = 0.045) and lower inhibitor means (22.0 vs. 30.9, P = 0.041). These findings suggest that age, residence, and gestational age are important determinants of the effectiveness and sustainability of KMC practices, underlining the need for targeted strategies tailored to specific maternal and neonatal profiles to enhance KMC support across both settings.

Table 1: Comparison of Enablers and Inhibitors of Kangaroo Mother Care in Hospital and Home Settings

	Group 1 (In Hospital)	Group 2 (At Home)	P value
	Mean SD	Mean SD	
Enablers	69.1 +10.3	77.75+ 4.33	2.15(0.047)
Inhibitors	30.8 +10.3	22.2 +4.33	2.25(0.045)

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Table 2: Subgroup Analysis of Enablers and Inhibitors

Subgroup	Enablers Mean (Hospital)	Enablers Mean (Home)	P-Value (Enablers)	Inhibitors Mean (Hospital)	Inhibitors Mean (Home)	P-Value (Inhibitors)
Maternal Age ≤ 30	68.2	78.3	0.041	31.2	21.8	0.039
Maternal Age > 30	70.4	76.5	0.053	30.3	22.6	0.057
Urban Residence	69.5	78.2	0.038	30.6	21.9	0.036
Rural Residence	68.3	75.8	0.062	31.1	23.0	0.061
Preterm (<37 weeks)	68.7	77.9	0.045	30.9	22.0	0.041
Full-term (≥37 weeks)	70.6	76.8	0.067	30.4	22.8	0.060
Gestational Age ≤ 34 weeks	67.9	78.1	0.043	31.0	21.7	0.038
Gestational Age > 34 weeks	70.9	77.4	0.051	30.5	22.6	0.054

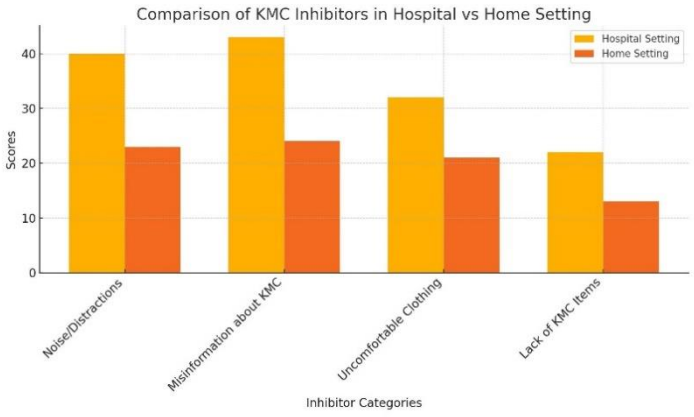


Figure 1Comparison of KMC Inhibitors in Hospital vs Home Setting

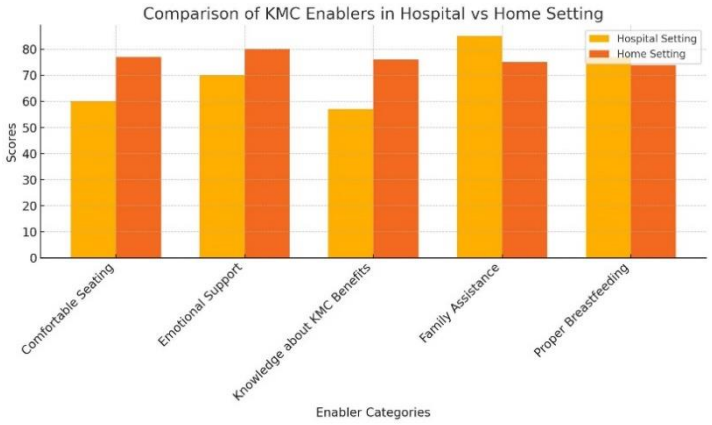
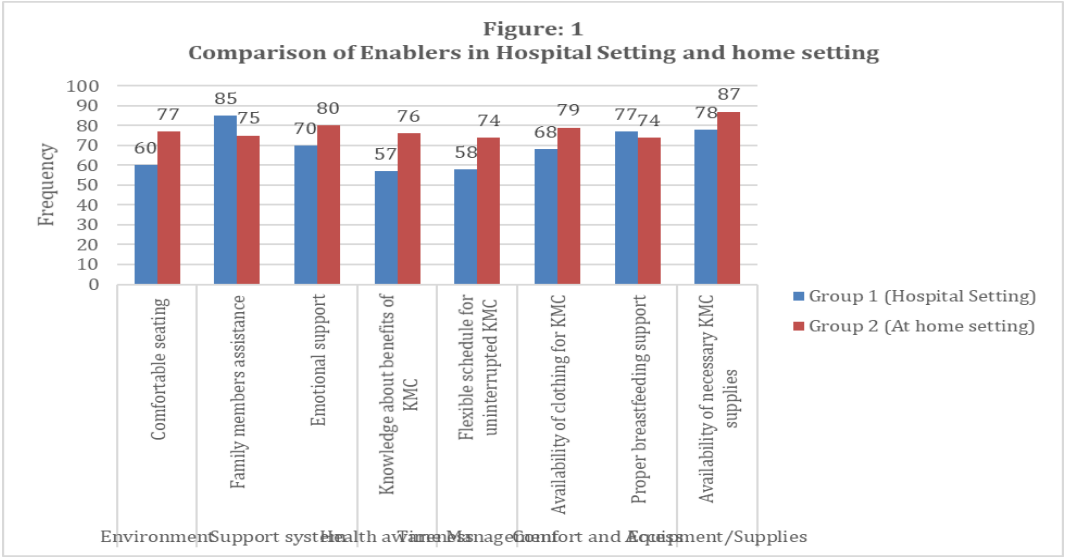


Figure 2 Comparison of KMC Enablers in Hospital vs Home Setting



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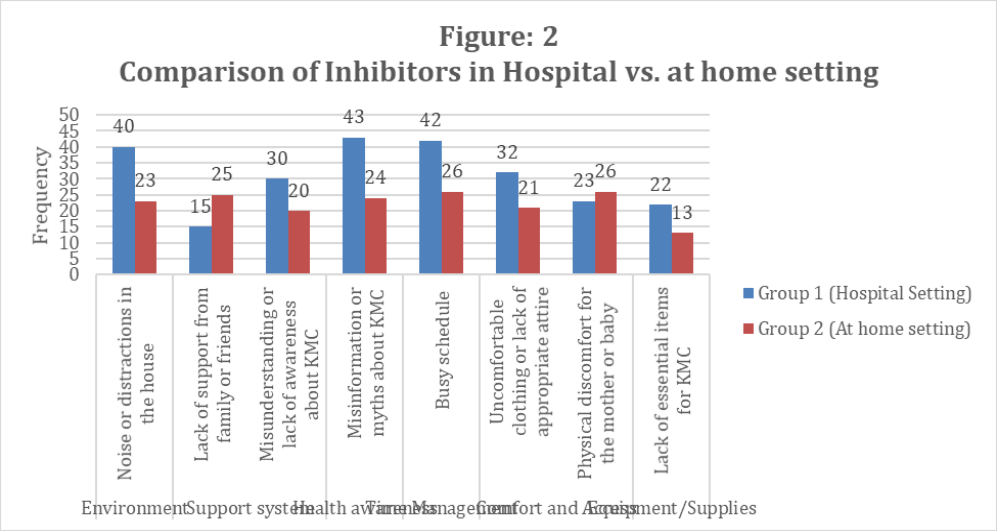

DISCUSSION

Kangaroo Mother Care (KMC) has been globally acknowledged as an effective, low-cost intervention to improve neonatal outcomes, especially among preterm and low-birth-weight infants. This study found that while hospital settings provide the necessary infrastructure and clinical supervision to initiate KMC, the home environment appeared to offer stronger enablers such as emotional support, maternal comfort, and improved understanding of KMC benefits. These findings support earlier research demonstrating the positive impact of family support and maternal confidence on KMC adherence in community settings (10,11). The enhanced enabler scores at home highlight the value of a nurturing and flexible environment in sustaining KMC beyond hospital discharge. Structured hospital environments, bolstered by trained healthcare professionals and designated KMC units, have consistently been shown to enhance the initiation and quality of KMC practices. Institutional support, ongoing education, and continuous monitoring significantly contribute to maternal confidence and neonatal health outcomes (12). However, despite these strengths, hospital settings in this study revealed higher inhibitor scores, suggesting that environmental constraints such as noise, lack of privacy, rigid routines, and inadequate staffing may hinder continuous KMC implementation. These observations are consistent with literature identifying overcrowding, limited privacy, and lack of institutional flexibility as persistent barriers to effective KMC delivery in hospitals (13-15).

The transition to post-discharge KMC was marked by notable benefits, especially in maternal empowerment and adaptability. Participants practicing KMC at home reported greater autonomy, increased comfort, and stronger emotional connections, leading to improved continuity of care. Previous studies have similarly emphasized the role of family encouragement and the freedom to integrate KMC into daily routines as key facilitators of adherence after hospital discharge (16,17). However, the absence of structured follow-up and professional supervision in the community emerged as a significant barrier. The lack of continued healthcare provider engagement and peer support left some mothers vulnerable to misinformation and inconsistent practices, particularly when faced with competing household responsibilities or societal misconceptions (18,19). Institutional protocols that promote skin-to-skin contact and exclusive breastfeeding play a dual role as both enablers and potential inhibitors, depending on their implementation. While integration of KMC into hospital policy enhances adoption, inconsistencies in training and infrastructural limitations reduce its effectiveness. The presence of trained healthcare workers, motivational counseling, and use of simple privacy measures such as screens have shown to facilitate maternal adherence (20). These findings underscore the need for targeted improvements within hospital environments, including the strengthening of privacy, resource availability, and staff support systems.

The strength of this study lies in its mixed-methods approach, which allowed for the integration of statistical data with qualitative insights, providing a comprehensive view of KMC practices across hospital and home settings. The inclusion of both environments enabled the identification of context-specific enablers and barriers, offering valuable evidence for policy refinement and program development. However, the study was limited to a single geographic location, which may restrict the generalizability of its findings.

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Additionally, reliance on self-reported data raises the possibility of recall and social desirability bias, potentially influencing the accuracy of maternal responses regarding KMC adherence. Future research should aim to explore multi-regional comparisons and assess the impact of structured community-based follow-up programs on long-term KMC sustainability. Evaluating the role of caregiver education, peer-led support networks, and telehealth follow-ups could offer innovative solutions for bridging post-discharge care gaps. Moreover, integrating KMC promotion into maternal and child health strategies at both institutional and community levels would help create a continuum of care critical for improving neonatal survival and development. The findings of this study reinforce the importance of culturally sensitive, resource-appropriate, and family-centered approaches to ensure the success and longevity of KMC practices in diverse healthcare settings.

CONCLUSION

This study concludes that while hospitals offer the structural foundation and clinical support necessary to initiate Kangaroo Mother Care (KMC), they also present considerable barriers that may hinder its consistent implementation. Environmental factors such as noise, misinformation, rigid routines, and limited maternal comfort were found to be key challenges within hospital settings. In contrast, the home environment emerged as a more nurturing space for continuing KMC, with enhanced emotional support and maternal comfort, albeit with less professional guidance. These findings emphasize the need for health systems to strengthen post-discharge support and address institutional barriers, ensuring that both hospital and home settings can work in synergy to optimize KMC outcomes for vulnerable neonates.

AUTHOR CONTRIBUTION

Author	Contribution
Shagufta Niazi*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Sikandar Hayat	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Wasim Salim	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Azhar Farooq	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Farrukh Saeed	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Tahira Bukhari	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published

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