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KNOWLEDGE, ATTITUDE AND PRACTICE TOWARDS KANGAROO MOTHER CARE AMONG HEALTHCARE WORKERS IN A TERTIARY CARE SETTING

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Kangaroo Mother Care, knowledge, attitude, practice, healthcare workers, neonatal care, Pakistan.

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Abstract

Background: *Kangaroo Mother Care (KMC) is a simple, low-cost, evidence-based intervention that improves survival and health outcomes among preterm and low-birth-weight infants. Despite its proven effectiveness, KMC implementation remains limited in many low- and middle-income countries, including Pakistan, where neonatal mortality remains high. Healthcare workers' knowledge, attitudes, and practices (KAP) are essential to successfully integrating KMC into routine neonatal care.*

Objective: *To assess knowledge, attitudes, and practices regarding Kangaroo Mother Care among healthcare workers in a tertiary care setting in Hyderabad, Pakistan.*

Methods: *A descriptive cross-sectional study was conducted from December 2024 to March 2026 at Liaquat University Hospital, Hyderabad/Jamshoro. A total of 200 healthcare workers were recruited using convenience sampling. Data were collected using a structured, self-administered questionnaire. Descriptive and inferential statistics were analyzed using IBM SPSS version 26.0. A p-value of <0.05 was considered statistically significant.*

Results: *Among 200 healthcare workers, 67.0% were female, 50.0% were nurses, and 65.0% had not received formal KMC training. Good knowledge was observed in 22.0% of participants, while 65.0% had moderate knowledge. Positive attitudes toward KMC were reported by 54.0%; however, only 9.0% demonstrated good KMC practice. Formal KMC training was significantly associated with better knowledge (p<0.001), and higher knowledge was associated with improved practice (p<0.001). The main barriers to KMC implementation were high workload (74.5%), lack of institutional guidelines (47.5%), safety concerns (45.0%), and inadequate dedicated space (42.5%).*

Conclusion: *Healthcare workers had moderate knowledge and positive attitudes toward KMC, but practice remained inadequate. Strengthening competency-based training, standardized protocols, and institutional support is essential to improve routine KMC implementation and neonatal outcomes.*

Introduction

Neonatal survival remains a major global public health priority, as the neonatal period (the first 28 days of life) is the most vulnerable stage for child survival. Approximately 2.4 million newborns die each year, primarily due to complications of preterm birth, low birth weight (LBW), birth asphyxia, and neonatal infections, particularly in low- and middle-income countries (1). Although global under-five mortality has

declined substantially, reductions in neonatal mortality have been slower, with neonatal deaths accounting for nearly half of all deaths among children under five years of age (1). To address this challenge, Sustainable Development Goal (SDG) 3.2 aims to reduce neonatal mortality to fewer than 12 deaths per 1,000 live births by 2030 (2). Kangaroo Mother Care (KMC) is a simple, low-cost, evidence-based intervention recommended for improving outcomes among preterm and low-birth-weight infants (3). KMC consists of continuous skin-to-skin contact, exclusive breastfeeding whenever possible, and early discharge with appropriate follow-up (3,4). Extensive evidence demonstrates that KMC significantly reduces neonatal mortality, hypothermia, severe infections, and hospital stay while improving breastfeeding, weight gain, mother–infant bonding, and neurodevelopmental outcomes (3–6). Based on this evidence, the World Health Organization recommends KMC as a routine component of neonatal care for clinically stable preterm and low-birth-weight infants and has recently advocated its early initiation to further improve neonatal survival (3,4). Pakistan continues to have one of the highest neonatal mortality rates globally, exceeding 40 deaths per 1,000 live births, with prematurity and low birth weight remaining major contributors to neonatal deaths (7,8). In Sindh Province, maternal malnutrition, inadequate antenatal care, and early marriage further increase the burden of adverse neonatal outcomes (8). Tertiary care hospitals manage a large number of high-risk newborns, highlighting the importance of cost-effective interventions such as KMC to improve neonatal survival and reduce dependence on intensive technological care (9). Despite strong evidence supporting KMC, its implementation remains inconsistent in many healthcare settings. Successful implementation depends largely on healthcare workers' knowledge, attitudes, and clinical practices, as well as institutional support (10). Studies from Pakistan, Ethiopia, Indonesia, and Uganda have reported that inadequate training, heavy workload, lack of standardized clinical guidelines, insufficient infrastructure, and limited organizational support are major barriers to KMC implementation (11–14). Evidence also indicates that healthcare workers who receive formal KMC training demonstrate significantly better knowledge, confidence, and adherence to recommended KMC practices than untrained staff (12,15). Although several international studies have evaluated healthcare workers' knowledge, attitudes, and practices regarding KMC, evidence from Pakistan remains limited, particularly in tertiary care hospitals in Sindh Province. Understanding healthcare workers' preparedness and the barriers affecting KMC implementation is essential for developing targeted training programs and strengthening neonatal care services. Therefore, this study aimed to assess the knowledge, attitudes, practices, and perceived barriers regarding Kangaroo Mother Care among healthcare workers in a tertiary care hospital in Hyderabad, Pakistan.

MATERIALS AND METHODS

A descriptive cross-sectional study was conducted from December 2024 to March 2026 at Liaquat University Hospital, Hyderabad/Jamshoro. The study population comprised healthcare workers, including doctors, nurses, paramedics, and midwives, working in the Neonatal Intensive Care Unit (NICU), Special Care Baby Unit (SCBU), labor room, and postnatal ward. A sample size of 200 healthcare workers was calculated using OpenEpi version 3.01, assuming a 50% prevalence of good knowledge, a 95% confidence interval, and a 7% margin of error. Participants were recruited using a non-probability convenience sampling technique. Registered healthcare professionals with at least six months of clinical experience in neonatal or maternity care who provided written informed consent were included, while administrative staff, student nurses, interns, healthcare workers on long-term leave, and those who declined participation or submitted incomplete questionnaires were excluded. Data were collected using a structured, self-administered questionnaire adapted from the World Health Organization (WHO) Kangaroo Mother Care guidelines and previously validated KAP instruments (9,12,13). The 41-item questionnaire comprised four sections: demographics (6 items), knowledge (15 items),

attitude (10 Likert-scale items), and practice (10 items). Content validity was established through expert review by three senior neonatologists and two nursing educators, and a pilot study involving 15 healthcare workers demonstrated good internal consistency (Cronbach's $\alpha = 0.84$). Completed questionnaires were checked for completeness, coded, and securely stored. Data were entered into Microsoft Excel and analyzed using IBM SPSS version 26.0. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize participants' demographic characteristics and KAP levels. Associations between categorical variables were assessed using the Chi-square test, while Pearson correlation was used to examine relationships between continuous KAP scores. A p-value of <0.05 was considered statistically significant. Permission for data collection was obtained from the Medical Superintendent, Liaquat University Hospital, Hyderabad/Jamshoro. Written informed consent was obtained from all participants before data collection. Confidentiality and anonymity were maintained by assigning unique identification codes and securely storing all study data with restricted access. Participation was voluntary, and participants were informed of their right to withdraw from the study at any stage without any consequences.

RESULTS

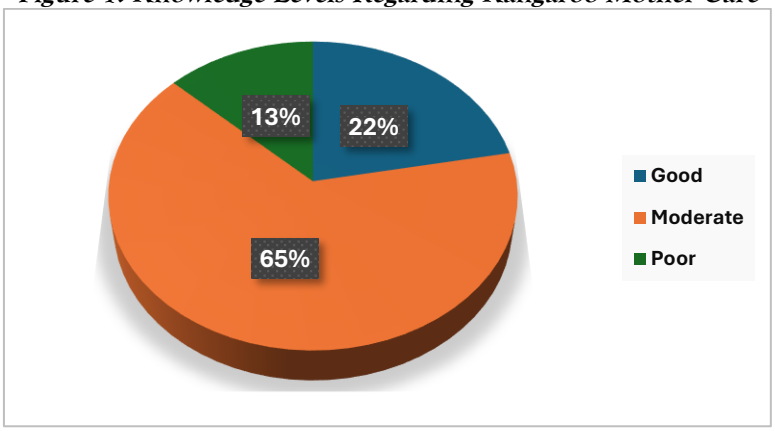
A total of 200 healthcare workers participated in the study. Most participants were aged 22–30 years (45.0%) and were female (67.0%). Nurses constituted the largest professional group (50.0%). Regarding clinical experience, 40.0% had less than five years of experience. Only 35.0% of participants had received formal Kangaroo Mother Care (KMC) training, whereas 65.0% had not received formal training (Table 1).

Table 1. Demographic characteristics of participants (N=200)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	22–30	90	45.0
	31–40	70	35.0
	>40	40	20.0
Gender	Male	66	33.0
	Female	134	67.0
Profession	Doctors	60	30.0
	Nurses	100	50.0
	Paramedics/Midwives	40	20.0
Years of experience	<5 years	80	40.0
	5–10 years	60	30.0
	>10 years	60	30.0
Formal KMC training	Received training	70	35.0
	No formal training	130	65.0

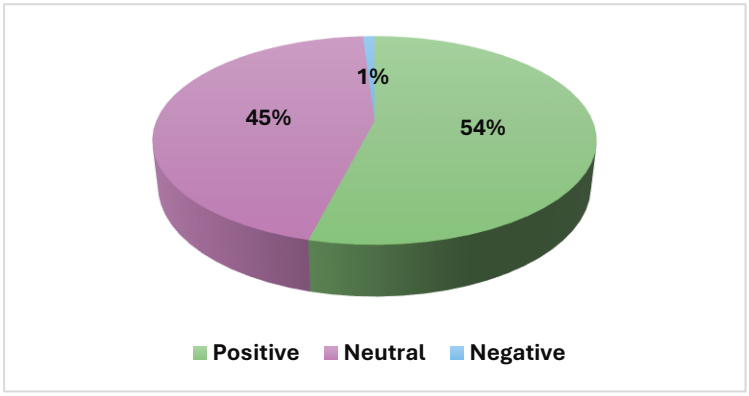
Most participants (65%) demonstrated moderate knowledge regarding Kangaroo Mother Care, while 22% had good knowledge and 13% had poor knowledge **(Figure 1).**

Figure 1. Knowledge Levels Regarding Kangaroo Mother Care



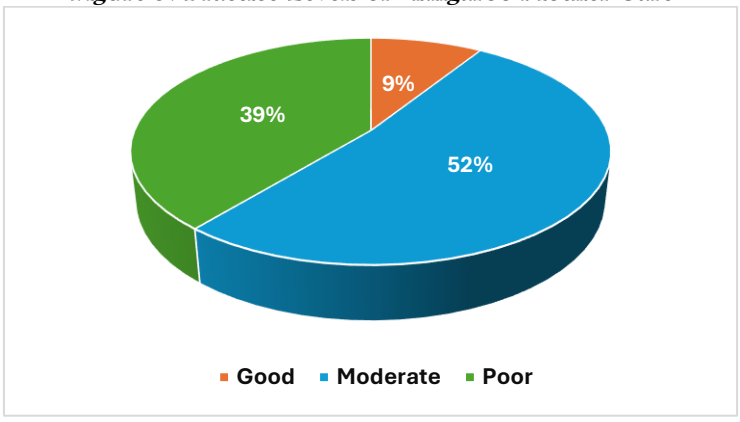
More than half (54%) of the participants demonstrated a positive attitude toward Kangaroo Mother Care, whereas 45% had a neutral attitude and only 1.0% had a negative attitude **(Figure 2).**

Figure 2. Attitude Towards Kangaroo Mother Care



Good Kangaroo Mother Care practice was observed in only 9% of participants, while 52% demonstrated moderate practice and 39% had poor practice **(Figure 3).**

Figure 3. Practice Levels of Kangaroo Mother Care



High workload (74.5%) was the most frequently reported barrier to KMC implementation, followed by lack of institutional guidelines (47.5%), safety concerns (45.0%), and lack of

dedicated space (42.5%). Maternal reluctance (15.0%) was the least frequently reported barrier **(Table 2).**

Table 2: Perceived Barriers to KMC Implementation

Perceived barrier	Frequency (n)	Percentage (%)
High workload	149	74.5
Lack of guidelines	95	47.5
Safety concerns	90	45.0
Lack of dedicated space	85	42.5
Maternal reluctance	30	15.0

Formal KMC training was significantly associated with knowledge level ($\chi^2 = 50.86$, $p < 0.001$). Good knowledge was observed in 51.4% of trained healthcare workers compared with 6.2% of untrained participants, indicating that formal training significantly improved KMC knowledge **(Table 3).**

Table 3: Association between Formal KMC Training and Knowledge Level (N = 200)

Training Status	Good Knowledge n (%)	Moderate/Poor Knowledge n (%)	Total	χ^2	p-value
Trained	36 (51.4)	34 (48.6)	70	50.86	<0.001*
Untrained	8 (6.2)	122 (93.8)	130		

Knowledge level was significantly associated with KMC practice ($\chi^2 = 41.96$, $p < 0.001$). Good KMC practice was observed in 31.8% of participants with good knowledge compared with 2.6% of those with moderate or poor knowledge, indicating that higher knowledge was associated with better KMC practice **(Table 4).**

Table 4: Association between Knowledge Level and KMC Practice (N = 200)

Knowledge Level	Good Practice n (%)	Moderate/Poor Practice n (%)	Total	χ^2	p-value
Good	14 (31.8)	30 (68.2)	44	41.96	<0.001*
Moderate/Poor	4 (2.6)	152 (97.4)	156		

No significant association was found between professional category and KMC practice ($\chi^2 = 16.76$, $p = 0.078$). Good KMC practice was reported by 10.0% of doctors, 10.0% of nurses, and 5.0% of paramedics/midwives, indicating no significant difference across professional groups **(Table 5).**

Table 5: Association between Profession and KMC Practice (N = 200)

Profession	Good Practice n (%)	Moderate/Poor Practice n (%)	Total	χ^2	p-value
Doctors	6 (10.0)	54 (90.0)	60	16.76	0.078
Nurses	10 (10.0)	90 (90.0)	100		
Paramedics/Midwives	2 (5.0)	38 (95.0)	40		

DISCUSSION

The present study assessed the knowledge, attitude, practice, and perceived barriers

regarding Kangaroo Mother Care (KMC) among 200 healthcare workers. Most participants were young (45.0% aged 22–30 years), female (67.0%), and nurses (50.0%), while only 35.0% had received formal KMC training. This low training coverage is concerning, as competency-based provider training is essential for effective KMC implementation and improved neonatal outcomes (16). Most participants (65%) demonstrated moderate knowledge, whereas only 22% had good knowledge, indicating that KMC knowledge remains suboptimal. Similar findings have been reported in Pakistan, where healthcare professionals demonstrated predominantly moderate knowledge because of limited formal education (17). Likewise, an Ethiopian systematic review reported considerable variation in KMC knowledge and emphasized the continued need for education and training (18). More than half (54%) of participants had a positive attitude toward KMC, while only 1% reported a negative attitude. This finding is consistent with the Ethiopian systematic review, which reported a pooled positive attitude of 61.6%, suggesting that healthcare workers generally accept KMC despite knowledge and implementation gaps (18). Despite moderate knowledge and positive attitudes, only 9% of participants demonstrated good KMC practice, indicating a clear knowledge–practice gap. Similar findings have been reported in Pakistan, where KMC implementation remained inconsistent despite favorable perceptions (19). Likewise, a study from Indonesia found that although nursing staff had adequate knowledge and positive attitudes, KMC practice remained limited because of inadequate training, heavy workload, and insufficient institutional support (20). High workload (74.5%) was the most frequently reported barrier, followed by lack of institutional guidelines, safety concerns, and inadequate dedicated space. Similar barriers have been identified in Uganda, including staff shortages, heavy workload, limited infrastructure, inadequate funding, and weak managerial support (21). The World Health Organization also recognizes inadequate health-system capacity, insufficient provider training, limited infrastructure, and lack of institutional policies as major barriers to scaling up KMC (22). Formal KMC training was significantly associated with knowledge ($\chi^2 = 50.86$, $p < 0.001$). More than half (51.4%) of trained healthcare workers demonstrated good knowledge compared with only 6.2% of untrained participants. This finding is consistent with evidence from Pakistan showing that formal education and in-service training are key determinants of KMC knowledge and readiness for implementation (23). Knowledge was also significantly associated with KMC practice ($\chi^2 = 41.96$, $p < 0.001$). Healthcare workers with good knowledge were more likely to demonstrate good KMC practice than those with moderate or poor knowledge. Similar findings from Ethiopia and Indonesia indicate that better knowledge improves KMC practice, although sustained implementation also depends on institutional support and adequate resources (18,20). No significant association was observed between professional category and KMC practice ($p = 0.078$). Doctors, nurses, and paramedics demonstrated similarly low levels of good practice, suggesting that KMC implementation is influenced more by institutional factors than professional discipline. Similar evidence indicates that organizational barriers, including inadequate staffing, limited infrastructure, insufficient resources, and lack of standardized protocols, affect KMC implementation across all healthcare professional groups (24). Formal KMC training was associated with better knowledge, and higher knowledge translated into improved KMC practice. However, institutional barriers, particularly high workload, inadequate infrastructure, and the absence of standardized guidelines, continue to hinder effective KMC implementation. These findings emphasize the need for regular competency-based training together with stronger organizational support to improve KMC practice.

CONCLUSION

Healthcare workers showed moderate knowledge and positive attitudes toward Kangaroo Mother Care; however, actual practice remained inadequate. Formal training significantly improved KMC knowledge, which was associated with better practice. Major barriers included high workload, lack of

guidelines, safety concerns, and limited space. Regular competency-based training, standardized protocols, and institutional support are essential to strengthen KMC implementation and improve neonatal outcomes.

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