Barriers to the Introduction of Kangaroo Mother Care by Nurses and Midwives at Hospitals of Kirkuk City

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Abstract
Background: Kangaroo mother care is an evidence-based intervention for preterm and low-birth-weight infants with proven effects in reducing neonatal mortality and morbidity. Despite the evidence-based benefits of kangaroo mother care, it is not widely implemented. In many cases, routine practices obstruct their consistent application, with barriers at the institutional, healthcare worker, maternal, and family levels.
Aim: This study aimed to identify the barriers to the implementation of Kangaroo Mother Care among nurses and midwives in Kirkuk City hospitals.
Methods: A descriptive cross-sectional study was conducted in hospitals of Kirkuk City. A purposive non-probability sampling technique was used to recruit 163 nurses and midwives. Data were collected using a self-administered structured questionnaire. Data were analyzed using SPSS version 26, applying both descriptive and inferential statistical analyses.
Results: The findings indicated that nurses and midwives experienced a high level of perceived barriers to implementing KMC (70.6%). The most frequently reported barrier is the lack of experience or professional expertise (86.5%). System-related barriers such as insufficient support (81%) and high workload (80.4%) were also reported. A weak positive correlation was found between knowledge and perceived barriers (r =.214, p =.006), indicating that nurses and midwives with high knowledge perceive slightly fewer barriers.
Conclusion: Nurses and midwives encounter significant barriers in the implementation of kangaroo mother care, with 70.6% reporting a "high" level of perceived barriers.

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Introduction

Preterm birth and low birth weight (LBW and PTB) continue to be major global public health concerns, contributing significantly to the overall incidence of disease (Liu *et al*., 2024) [9]. Premature births account for about 15% of all pregnancies globally and 70% of neonatal deaths (Darghiyan *et al*., 2023) [7].

However, recent statistics indicate that Iraq's neonatal mortality rate improved from 14 deaths per 1,000 live births in 2021 to 13 deaths per 1,000 live births in 2022. In comparison, the global average stands at 12 deaths per 1,000 live births. These figures underscore the urgent need for advancements in newborn healthcare. (UNICEF, 2022) [16].

Kangaroo Mother Care (KMC) is a clinically validated approach that has demonstrated efficacy in improving the health and survival rates of these vulnerable infants. Additionally, infants who received KMC—which involves direct contact between mother and infant—showed better weight gain and strengthened the mother-infant bond (Chamhene & Moshi, 2023) [6]. Kangaroo Mother Care also enhances maternal health in high-income, middle-income, and low-income countries. Compared to standard care, it significantly reduces neonatal mortality, sepsis, hypothermia, hypoglycemia, and duration of hospital stay (Gebeyehu *et al*., 2021) [17]. Kangaroo Mother Care (KMC) was a program established in Colombia to enable families to care for their low-birth-weight and premature infants (Abadía-Barrero, 2018) [1].

Although these principles are broadly acknowledged in clinical settings, their implementation within practical policies faces professional and administrative challenges (Maniago *et al*., 2020) [11]. To ensure that infants and their families receive thorough, patient-centered, and compassionate care, effective nursing practices are essential (Sales *et al*., 2018) [14].

Even though kangaroo mother care has demonstrated benefits, it is not commonly used. Routine procedures frequently make it difficult to apply it consistently, with barriers at the institutional, healthcare worker, maternal, and family levels. The majority of these barriers have more to do with established routines than with health issues (Alenchery *et al*., 2018) [3]. Institutional barriers include a lack of beds, space, and staff trained to provide clinical care, counseling, and family support. However, only a limited number of countries have successfully expanded the application of kangaroo mother care beyond the designated areas. (Calibo *et al*., 2021) [5]. According to previous studies, medical professionals and caregivers often report several reasons for their resistance to participating in KMC, including time constraints, cultural barriers, a lack of support from nursing staff, and a lack of understanding of the technique (Mala & Abdul-Sahib, 2022) [10].

However, despite their potential significance in this understudied research environment, barriers to the application of Kangaroo Mother Care (KMC) in Kirkuk City have not yet been fully investigated. Due to regional variations in healthcare systems and cultural influences, there is a significant knowledge gap in this context.

Methodology

Study design and setting

A descriptive cross-sectional study was conducted. The study was conducted on the nurses and midwives who work in the maternity department (delivery rooms) and the Intensive Care Unit of the three hospitals under the Kirkuk Health Directorate: Kirkuk Teaching Hospitals, Azadi Teaching Hospitals, and AL-Naser Maternity and Child Hospital. The study sample A purposive non-probability sampling technique was used to recruit 163 nurses and midwives in the maternity unit (delivery room) and the intensive care unit.

Inclusion Criteria

Nurses and midwives are responsible for providing direct care in the delivery room and in the Neonatal Intensive Care Unit (NICU). Nurses and midwives from all educational levels.

Nurses and midwives with at least six months of experience in the delivery room and Neonatal Intensive Care Unit (NICU).

Exclusion Criteria

Nurses and midwives who held administrative positions only, such as head nurses, nurses, and midwives, were not present or on leave during the data collection period, and nurses and midwives who refused to participate in the study

Method of Data Collection

The data were gathered using a structured questionnaire.

The questionnaire was developed based on a comprehensive review of the literature and previous studies relevant to the study topic (Al-Shehri & Binmanee, 2021; Chan *et al*., 2017) [19, 18].

The questionnaire consisted of four parts:

Part (1): Sociodemographic Characteristics of Nurses and Midwives.

It consisted of five questions about the research participants' sociodemographic characteristics, including their age, marital status, level of education, place of residence, and socioeconomic status.

Part (2): Professional Characteristics:

It consisted of five questions that addressed the professional characteristics of midwives and nurses. These included their length of service, the number of years they worked in the intensive care unit and delivery room, participation in training related to Kangaroo Mother Care, their work area, and their work shift.

Part (3): Knowledge of Nurses and Midwives Regarding Kangaroo Mother Care: It consisted of sixteen questions that covered physiological regulation in neonates, breastfeeding, immunity, and the clinical benefits of KMC.

Part (4): Barriers to the Implementation of Kangaroo Mother Care: It consisted of seventeen questions that included institutional and healthcare worker-related barriers and environmental or clinical barriers.

The Tool of Validity and Reliability

A panel of ten experts assessed the content validity of the instructional questionnaire. The panel included three faculty members from the College of Nursing, University of Kirkuk; two from the College of Nursing, University of Mosul; two from the University of Baghdad; two pediatricians from Kirkuk and Tikrit hospitals; and one faculty member from the College of Health Sciences, Hawler Medical University. Cronbach's alpha was used to assess internal consistency, while Pearson's correlation coefficient was applied to examine item relationships.

Data Analysis

Data and results were analyzed and interpreted using the Statistical Software for Social Sciences (SPSS), version 26.0. The computation of mean (M), standard deviation (SD), frequency (f), and percentage (%) is a basic component of descriptive data analysis. Statistical methodologies utilized in inferential data analysis include Cronbach's alpha (α), the Pearson correlation coefficient, Spearman's rank correlation coefficient, the Wilcoxon signed-rank test, and the Shapiro-Wilk test.

The result

Table 1: Description of Participants' Sociodemographic Variables (SDVs) (N=163)

SDVs	Categories	No	%
Age (Years) M±SD = 30 ± 9.8	20–29	94	57.7
	30–39	51	31.3
	40–49	12	7.3
	50+	6	3.7
Marital status	Single	52	31.9
	Married	106	65
	Divorced	3	1.8
	Widowed	2	1.2
Level of education in nursing	Secondary school	10	6.1
	Midwifery Secondary sch.	22	13.4
	High Health Institution	93	57.1
	Diploma	26	16
	Bachelor	12	7.4
Residency	Urban	156	95.7
	Rural	7	4.3
Perceived Socioeconomic status	Sufficient	86	52.8
	Barely sufficient	59	36.2
	Insufficient	18	11

No: Number, %: Percentage, M: Mean, SD: Standard deviation

Table 1 describes sociodemographic variables of nurses and midwives who participated in the study (N=163); the findings indicate that the average age is 30±9.8 years, and more than half (57.7%) of them fell within the age group of 20 – 29 years. The marital status reveals that a higher proportion (65%) were married. Regarding the level of education in nursing, more than half (57.4%) of nurses and midwives graduated from high-quality institutions. The residency indicates that the majority (95.7%) of nurses and midwives were residing in urban areas. Concerning socioeconomic status, 52.8% of nurses and midwives perceive their socioeconomic status as sufficient.

Table 2: Description of Participants' Professional Variables (N = 163)

Variables	Categories	No	%
Years of experience M±SD = 7 ± 6	1–5	80	49.1
	6–10	50	30.7
	11–15	24	14.7
	16–20	2	1.2
	21+	7	4.3
Current unit years of experience M±SD = 5 ± 5.5	>1	6	3.7
	1–5	100	61.3
	6–10	33	20.2
	11–15	18	11
	16–20	2	1.2
	21+	4	2.5
Participation in training courses	None	90	55.2
	1–3	55	33.7
	4–6	14	8.6
	7–10	4	2.5
Current workplace	Delivery room	106	65
	NICU	57	35
Duty shift	Morning	57	35
	Evening	44	27
	Night	62	38

No.: Number, %: Percentage, M: Mean, SD: Standard deviation

Table 2 presents the description of professional variables for nurses and midwives; the findings reveal 7±6 years of experience in general, with 49.1% having 1 – 5 years of experience. The average years of experience in the current unit refer to ***±5.5,*** and 61.3% have 1 – 5 years, indicating that nurses and midwives have moderate experience. Regarding participation in training courses about Kangaroo Mother Care, less than half participated, with most participants attending 1 – 3 training courses. The current workplace shows that 65% of nurses and midwives work in the delivery room and 35% work in the Neonate Intensive Care Unit (NICU). Concerning duty shifts, 38% of nurses and midwives work during the night.

Table 3: Assessment of Nurses and Midwives' Knowledge Items about Implementation of Kangaroo Mother Care (KMC) (N=163)

List	Knowledge	Don't know f (%)	Know f (%)	Mean score	Assess.
1	KMC promotes emotional bonding between the mother and the newborn	12 (7.4)	151 (92.6)	.93	Good
2	KMC facilitates the stabilization of the newborn's body temperature (thermoregulation)	12 (7.4)	151 (92.6)	.93	Good
3	The application of skin-to-skin contact (SSCC) helps stabilize the newborn's oxygen saturation levels	19 (11.7)	144 (88.3)	.88	Good
4	KMC promotes and supports exclusive breastfeeding	19 (11.7)	144 (88.3)	.88	Good
5	KMC enhances the newborn's immunity and reduces the risk of neonatal morbidity	33 (20.2)	130 (79.8)	.80	Good
6	It is preferable to defer KMC if the newborn is connected to mechanical ventilation	60 (36.8)	103 (63.2)	.63	Moderate
7	It is preferable to delay KMC for newborns weighing less than 1,000 grams until clinical stability is achieved	56 (34.4)	107 (65.6)	.66	Moderate
8	Newborns exhibit signs of comfort and satisfaction during the practice of KMC	19 (11.7)	144 (88.3)	.88	Good
9	KMC can be implemented for newborns undergoing phototherapy	63 (38.7)	100 (61.3)	.61	Moderate
10	KMC assists in stabilizing the newborn's heart rate and regulating cardiac rhythm	21 (12.9)	142 (87.1)	.87	Good
11	KMC can be safely applied to newborns with intravenous (IV) infusion sets	43 (26.4)	120 (73.6)	.74	Good
12	The application of KMC regulates the respiratory rate of the neonate	27 (16.2)	136 (83.4)	.83	Good
13	It is preferable to avoid KMC for neonates born at less than 28 weeks' gestation until their health status stabilizes	55 (33.7)	108 (66.3)	.66	Moderate
14	KMC is safe for medically stable preterm infants	31 (19)	132 (81)	.81	Good
15	KMC contributes to the reduction of stress and infant crying	17 (10.4)	146 (89.6)	.90	Good
16	KMC promotes physiological weight gain in preterm infants	35 (21.5)	128 (78.5)	.79	Good

M: Mean, f: Frequency, %: Percentage assessment: Assess
Poor = 0.00 – 0.33, Moderate = 0.34 – 0.67, Good= 0.68 – 1.00

Table 3 presents the assessment of knowledge items among nurse midwives about Kangaroo Mother Care (KMC). The nurses and midwives demonstrated a good level of knowledge regarding KMC's role in reducing infant stress (89.6%), stabilizing heart rate (87.1%), and promoting exclusive breastfeeding (88.3%). However, a knowledge gap was found in aspects related to complex clinical scenarios, as indicated by a moderate level of knowledge in items related to implementing KMC during phototherapy (61.3%), managing newborns on mechanical ventilation (63.2%), and the care of extremely low-birth-weight infants under 1,000 grams (65.6%).

Table 4: Assessment of Perceived Barrier by Nurses and Midwives Regarding Implementation of Kangaroo Mother Care (KMC) (N=163)

List	Barriers	No f (%)	Yes f (%)	Mean score	Assess.
1	Lack of training or professional knowledge	22 (13.5)	141 (86.5)	.87	High
2	Shortage of equipment or inadequate space	36 (22.1)	127 (77.9)	.78	High
3	Absence of health system support for KMC implementation	31 (19)	132 (81)	.81	High
4	Shortage of healthcare staff in the delivery and Neonatal Intensive Care Units (NICU).	47 (28.8)	116 (71.2)	.71	High
5	High workload and excessive duties assigned to a single nurse-midwife	32 (19.6)	131 (80.4)	.80	High
6	Absence of clear hospital policies or clinical guidelines regarding KMC application	40 (24.5)	123 (75.5)	.75	High
7	Lack of motivation among healthcare staff to practice KMC	36 (22.1)	127 (77.9)	.78	High
8	Parental refusal or hesitation to participate in KMC.	43 (26.4)	120 (73.6)	.74	High
9	Difficulty in ensuring maternal privacy during KMC sessions	29 (17.8)	134 (82.2)	.82	High
10	The belief that conventional incubators are more beneficial than KMC	58 (35.6)	105 (64.4)	.64	Moderate
11	Fear of accidental ex-tubation or displacement of medical devices during KMC	31 (19)	132 (81)	.81	High
12	Fear of accidental dislodgement of intravenous (IV) cannulas or infusion sets during KMC.	32 (19.6)	131 (80.4)	.80	High
13	Time constraints faced by nurses and midwives for KMC implementation	44 (27)	119 (73)	.73	High
14	Clinical instability of the newborn or excessive crying, limiting KMC feasibility	43 (26.4)	120 (73.6)	.74	High
15	Traditional newborn care practices (e.g., early bathing or swaddling) hinder KMC	43 (26.4)	120 (73.6)	.74	High
16	Poor communication and interpersonal dynamics between nurse-midwives and parents	38 (23.3)	125 (76.7)	.77	High
17	Frequent visitors are limiting the mother's ability to practice KMC.	25 (15.3)	138 (84.7)	.85	High

M: Mean, f: Frequency, %: Percentage assessment: Assess
Low = 0.00 – 0.33, Moderate = 0.34 – 0.67, High= 0.68 – 1.00

The findings in Table 4 depict that nurses and midwives perceive significant barriers to the implementation of Kangaroo Mother Care (KMC). The biggest barrier is the lack of experience or professional expertise (86.5%, mean = 0.87), which is closely followed by external factors like regular visitor attendance (84.7%) and worries about maternal privacy (82.2%).

Systemic issues also weigh heavily, with a lack of support from health systems (81%) and high workloads (80.4%) cited as having an impact, as well as the fear of dislodgement of medical devices such as IV cannulas or accidental discharge from ventilators being reported (81% and 80.4%, respectively). While most barriers were rated high, the belief that conventional incubators are superior to KMC was the

only item rated as "Moderate" (64.4%), suggesting that while staff values KMC in theory, practical concerns regarding safety, staffing, and facility infrastructure create a substantial gap between evidence-based knowledge and clinical practice.

Table 5: Overall Assessment of Perceived Barriers regarding Implementation of Kangaroo Mother Care among Nurses and Midwives (N = 163)

Perceived Barriers	f	%	M ± SD	Assessment
Low	1	0.6		
Moderate	47	28.8	13.13 ± 3.289	High perceived barriers
High	115	70.6		
Total	163	100		

f: Frequency, %: Percentage
M: Mean for total score, SD: Standard deviation for total score
Low = 0.00 – 5.66, Moderate = 5.67 – 11.33, High = 11.34 – 17.00

Table 5 exhibits that 70.6% of nurses and midwives perceive a "high" level of barriers to the implementation of kangaroo mother care, with a mean score of 13.13 ± 3.289. Only 0.6% of them perceived a "low" level of barriers, while 28.8% perceived a "moderate" level of barriers.

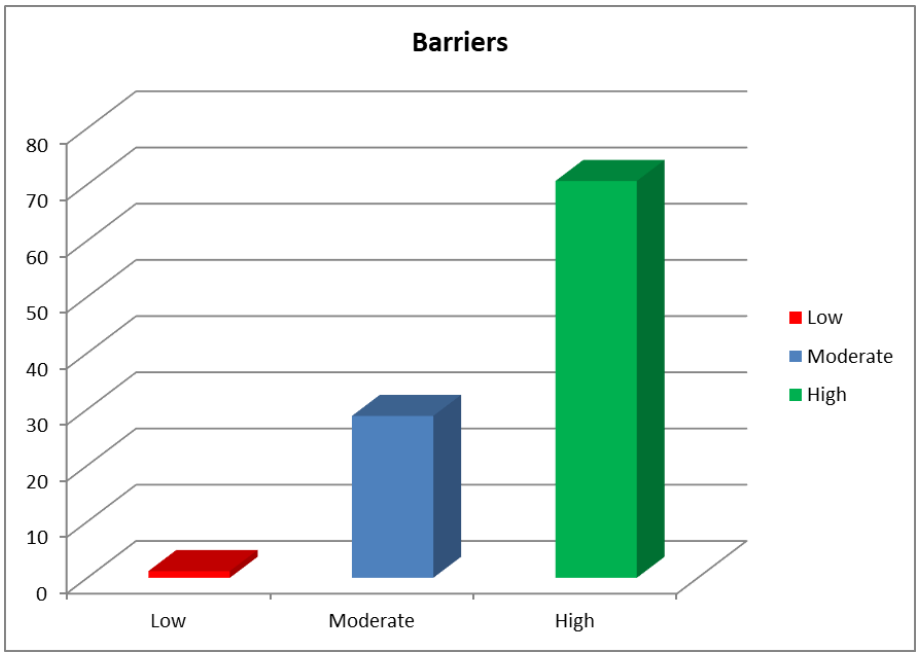

Fig 1: Levels of Perceived Barriers Regarding Implementation of Kangaroo Mother Care among Nurses and Midwives (N = 163)

This figure shows that 70.6% of nurse midwives perceive high barriers regarding the implementation of kangaroo mother care.

Discussion

Socio-Demographic Characteristics

The analysis of the findings shows the overall demographic characteristics of the 163 nurses and midwives who participated in the study. The finding reveals that the highest percentage of nurses and midwives is young. More than half of the nurse-midwives (57.7%) fell within the 20–29 age group, followed by those aged 30–39 years (31.3%).

The current results show a similar pattern to that reported by Ridha and Hanon (2025), who evaluated the effect of an educational program on nurses' and midwives' knowledge of the use and barriers of skin-to-skin contact in hospitals in Kirkuk City. The study found that over 40% of all nurse-midwives were in the 20–29 age range.

Regarding marital status, nurses and midwives showed that nearly two-thirds were married (65%), while 31.9% were single. Only a small proportion were divorced (1.8%) or widowed (1.2%). The predominance of married participants may be related to the age distribution of the sample, as this age group is commonly considered appropriate for marriage within the local community.

Regarding residency, it indicates that the majority (95.7%) of nurses and midwives reside in urban areas, while only 4.3% reside in rural areas. Regarding socioeconomic status, more than half of nurses and midwives reported that their income was sufficient, while a considerable proportion reported it as barely sufficient, and a small proportion reported it as insufficient.

Professional Characteristics

The findings reveal a range of years of experience as a general; 49.1% have 1 – 5 years.

of experience. The years of experience in the current unit are as follows: 61.3% have 1–5 years, indicating that nurse midwives have moderate experience. These findings are in agreement with the study by Kaynat *et al*. (2024) [8].

professional experience (42.8%), indicating a moderately experienced workforce.

Regarding participation in Kangaroo Mother Care training courses, less than half of the participants reported attending such programs, with most of them having participated in only one to three training sessions.

In contrast, a study conducted in Saudi Arabia by Almutairi (2022) reported that a considerable proportion of nurses did not receive adequate training on skin-to-skin contact during their orientation, and many, 42.5%, perceived existing guidelines as unclear or insufficient.

Surveying the current workplace reveals that 65% of nurse midwives work in the delivery room, and 35% work in the Neonatal Intensive Care Unit (NICU).

Regarding duty shift, 38% of nurse midwives work during the night, 35% work during the day (morning), and 27% work during the day (evening).

Knowledge about the Implementation of Kangaroo Mother

Nurses and midwives demonstrate a good level of knowledge on the implementation of Kangaroo Mother Care (KMC), according to an assessment of knowledge items among nurses and midwives. Understanding emotional bonding and thermoregulation was found to be highly understood. These results align with the research conducted by Omer (2021) [13].

A cross-sectional descriptive study by Al-Shehri & Binmanee (2021) [19], among NICU nurses in Riyadh, Saudi Arabia, examined the level of the nurses' knowledge about KMC in healthcare facilities. NICU nurses were found to have adequate knowledge. 92.6% of nurse midwives had demonstrated strong knowledge in this regard.

However, a knowledge gap was found in aspects related to complex clinical scenarios, as indicated by a moderate level of knowledge in items related to implementing KMC during phototherapy (61.3%), managing newborns on mechanical ventilation (63.2%), and the care of extremely low-birth-weight infants under 1,000 grams (65.6%).

This data indicated that there is a need for targeted educational programs regarding the proper execution of KMC for infants who are medically vulnerable or reliant on technology to achieve completeness.

Perceived Barriers

The biggest barrier is the lack of experience or professional expertise (86.5%), closely followed by external factors such as regular visitor attendance (84.7%) and worries about maternal privacy (82.2%).

Systemic issues also weigh heavily, with a lack of support from health systems (81%) and high workloads (80.4%) cited as having an impact.

These findings are congruent with the study by Tumukunde *et al*. (2024) [15], highlighting significant obstacles such as insufficient space for KMC beds in the neonatal unit and a lack of engagement from hospital management.

The study by Cai *et al*. (2022) found several barriers that hinder the implementation of kangaroo mother care, primarily focusing on the absence of privacy. Furthermore, inadequate leadership, a lack of professional expertise among staff, and insufficient training posed additional challenges for KMC.

Although most barriers were rated high, the perception that conventional incubators are better than KMC scored "Moderate" (64.4%), indicating that, as much as staff believe in KMC in theory, practical factors related to safety, staffing, and facility are such that there is a gap between evidence-based information and its application in clinical care at this NICU.

Conclusion

The study revealed that nurses and midwives face multiple barriers that hinder the implementation of kangaroo mother care. The main challenges at the individual level include limited clinical competence. Although nurses and midwives understand the importance of KMC, environmental and organizational challenges, such as a lack of privacy for the mother, frequent visitor disruptions, and inadequate institutional support, limit its consistent use.

Recommendation

1. Integrate Kangaroo Mother Care into policies, protocols, and routine clinical practice to ensure its consistent and sustainable implementation.
2. Implement regular training programs for nurses and midwives to improve their knowledge and skills regarding Kangaroo Mother Care (KMC).
3. Improve the hospital environment by ensuring adequate privacy for mothers during KMC practic***e.*** Regulating visiting hours within neonatal units, providing appropriate seating and equipment to support skin-to-skin contact sessions
4. Encourage continuous monitoring and evaluation of KMC practices to ensure adherence and quality of care.

Conduct further research on kangaroo mother care to evaluate its implementation in complex clinical cases like neonates receiving mechanical ventilation or phototherapy, to assess its sustainability, and to identify the organizational barriers to effectiveness within healthcare institutions and diverse communities.

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