



Knowledge and Practice Regarding Kangaroo Mother Care Among Staff Nurses Working in Paediatric and Obstetric Hospitals of Anand, Gujarat: A Cross-Sectional Study

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Abstract: Background - Kangaroo Mother Care (KMC) is an evidence-based intervention recommended by the World Health Organization to improve the survival and health outcomes of preterm and low-birth-weight infants. Despite national initiatives promoting KMC, inconsistent implementation persists, often due to inadequate knowledge and practice among nursing professionals. Assessing nurses' knowledge is essential for planning effective educational interventions and improving the quality of neonatal care.

Aim - To assess the knowledge regarding Kangaroo Mother Care among staff nurses working in selected paediatric and obstetric hospitals and clinics of Anand City and to determine their association with selected demographic variables.

Methodology - A quantitative exploratory survey was conducted among 177 staff nurses working in selected private paediatric and obstetric hospitals and clinics of Anand City using a convenience sampling technique. Data were collected using a validated, self-administered structured questionnaire comprising demographic characteristics and knowledge and practice items related to KMC. Descriptive statistics, independent samples t-test, and one-way analysis of variance (ANOVA) were used for data analysis, with statistical significance set at $p < 0.05$.

Results - The participants achieved a mean knowledge score of 13.03 ± 3.54 (range: 2–19), indicating an overall moderate level of knowledge regarding Kangaroo Mother Care. Staff nurses who had received formal KMC training demonstrated significantly higher knowledge scores than those without formal training (13.87 ± 3.45 vs. 12.39 ± 3.50 ; $t = 2.81$, $p = 0.006$). Educational qualification was also significantly associated with knowledge scores (ANOVA: $F = 15.22$, $p < 0.001$), with General Nursing and Midwifery (GNM) nurses achieving the highest mean scores.

Conclusion - The study demonstrated that formal KMC training and higher educational qualification were significantly associated with better knowledge regarding Kangaroo Mother Care. These findings emphasize the need for regular competency-based training, continuing nursing education, and strengthened integration of KMC into nursing curricula to enhance evidence-based neonatal care.

Keywords: Kangaroo Mother Care; Knowledge; Nursing Practice; Staff Nurses; Neonatal Care; Low Birth Weight; Preterm Infant.

1.1 INTRODUCTION:

Neonatal survival remains a major global public health priority, particularly among preterm and low-birth-weight (LBW) infants, who are at the highest risk of morbidity and mortality. According to recent UNICEF and United Nations estimates, approximately 2.3 million newborns die annually worldwide, with the majority of these deaths being preventable through timely implementation of evidence-based interventions. Although substantial progress has been made in reducing under-five mortality, neonatal deaths continue to account for nearly half of all deaths among children younger than five years, highlighting the urgent need to strengthen newborn care services.

India has achieved considerable improvements in newborn survival over the past two decades; however, it continues to bear one of the largest burdens of preterm birth and low-birth-weight infants. Prematurity, low birth weight, birth asphyxia, and neonatal infections remain the leading causes of neonatal mortality in the country. Every year, approximately 3.5 million babies are born preterm in India, and nearly one million newborns are discharged from Special Newborn Care Units (SNCUs) requiring continued essential newborn care and follow-up. These infants remain vulnerable to mortality, growth failure, and neurodevelopmental impairment if appropriate postnatal care is not provided.

Kangaroo Mother Care (KMC) is a simple, low-cost, and evidence-based intervention that includes prolonged skin-to-skin contact, exclusive breastfeeding whenever possible, and early discharge with appropriate follow-up. The World Health Organization (WHO) 2022 recommendations advocate KMC as routine care for all preterm and low-birth-weight infants and recommend initiating KMC as soon as possible after birth, even in healthcare facilities, for as many hours per day as feasible. Strong evidence demonstrates that KMC reduces neonatal mortality, hypothermia, severe infections, and hospital stay while improving breastfeeding, weight gain, parent–infant bonding, and long-term neurodevelopmental outcomes.

Recognizing its effectiveness, the Government of India, under the National Health Mission, has incorporated KMC into national newborn care strategies through operational guidelines and the establishment of KMC units in healthcare facilities. Updated operational guidelines emphasize strengthening facility-based implementation, standardizing clinical practice, and improving competency among healthcare providers. Despite these initiatives, studies have reported inconsistent implementation of KMC due to inadequate knowledge, insufficient practical training, lack of confidence among healthcare professionals, and variability in institutional practices.

Nurses play a pivotal role in the successful implementation of KMC by initiating skin-to-skin care, educating and counselling mothers and families, monitoring neonatal progress, and ensuring continuity of care during hospitalization and after discharge. Consequently, their knowledge and practical competence directly influence the quality and effectiveness of KMC services. Previous studies have reported variable levels of knowledge and practice among nursing professionals, indicating the need for continuous education and competency-based training.

Although several studies have evaluated healthcare professionals' knowledge and attitudes towards Kangaroo Mother Care, most have been conducted in tertiary care hospitals or have focused on specific categories of healthcare providers. Limited evidence is available regarding the knowledge and practice of staff nurses working across both pediatric and obstetric hospitals and clinics in Gujarat, particularly in Anand City. Furthermore, few studies have examined the influence of formal KMC training and educational qualification on nurses' knowledge. Therefore, the present study was undertaken to assess the knowledge and practice regarding Kangaroo Mother Care among staff nurses and to determine their association with selected demographic characteristics.

1.2 PROBLEM STATEMENT:

A study to assess knowledge and practice of KMC among the staff nurse of paediatric and obstetrics hospital/clinic of Anand city.

1.3 OBJECTIVE:

- I. To determine level of knowledge and practice of KMC among the staff nurse.
- II. To find out the association between knowledge and practice & demographic variables.

1.4 REVIEW OF LITERATURE:

Previous studies have reported varying levels of knowledge, attitude, and practice regarding Kangaroo Mother Care (KMC) among healthcare professionals and mothers. Aditey et al. (2017) found that although nurses demonstrated a positive attitude towards KMC, they lacked adequate knowledge regarding its benefits. Kumar and Sheela (2016) reported poor knowledge of KMC among postnatal mothers, emphasizing the need for educational interventions. Similarly, Shah et al. (2016) observed that most doctors and nurses had good knowledge and positive attitudes towards KMC; however, the implementation of KMC practices remained inconsistent across healthcare settings.

Despite these findings, previous studies have primarily focused on knowledge or attitudes among nurses, doctors, or postnatal mothers in different geographical regions. Limited evidence is available regarding the combined assessment of knowledge and practice of Kangaroo Mother Care among staff nurses working in both pediatric and obstetric hospitals and clinics in Gujarat, particularly in Anand City. Furthermore, the influence of demographic characteristics such as educational qualification, clinical experience, and formal KMC training on nurses' knowledge has not been adequately explored in the local context. Therefore, the present study was undertaken to assess the knowledge and practice regarding Kangaroo Mother Care among staff nurses and to determine their association with selected demographic variables.

2 METHODOLOGY:

Study Design - A quantitative exploratory survey design was adopted to assess the knowledge and practice regarding Kangaroo Mother Care (KMC) among staff nurses working in selected pediatric and obstetric hospitals and clinics of Anand City. The design was considered appropriate for describing the existing level of knowledge and practice and examining their association with selected demographic variables.

Study Setting - The study was conducted in selected private pediatric and obstetric hospitals and clinics located in Anand City, Gujarat, India. Prior permission for data collection was obtained from the respective hospital authorities before commencement of the study.

Study Population - The target population comprised staff nurses employed in private pediatric and obstetric hospitals and clinics.

Sample Size and Sampling Technique - A total of 177 staff nurses participated in the study. Participants were selected using a convenience sampling technique based on their availability during the data collection period and their willingness to participate. Although the proposal estimated a larger sample, the final study included 177 participants.

Eligibility Criteria - Eligible participants included registered staff nurses working in selected private pediatric and obstetric hospitals and clinics of Anand City who had at least one year of clinical experience and voluntarily agreed to participate by providing written informed consent. Nursing personnel working in government healthcare institutions, Auxiliary Nurse Midwives (ANMs), nursing aides, and other non-nursing personnel were excluded from the study.

Study Instrument - Data were collected using a self-developed structured questionnaire, prepared after an extensive review of the literature and expert consultation. The instrument consisted of two sections: Section I: Demographic characteristics including age, gender, educational qualification, clinical experience, type of healthcare facility, and previous formal KMC training. Section II: A structured questionnaire comprising 20 items designed to assess knowledge and practice regarding Kangaroo Mother Care. The questionnaire was originally developed in English and subsequently translated into the local language to facilitate participant comprehension. The translated version was reviewed to ensure conceptual equivalence.

Validity of the Instrument - The questionnaire underwent content validation by 10 experts, including six nursing experts and four subject specialists. Their suggestions were incorporated to improve the clarity, relevance, and comprehensiveness of the instrument before final administration.

Data Collection Procedure - Ethical approval was obtained from the Institutional Ethics Committee prior to data collection. Administrative permission was subsequently obtained from the selected hospitals and clinics. The researcher approached eligible participants individually, introduced the study, explained its objectives, and provided a Participant Information Sheet. Written informed consent was obtained before enrolment. Participants completed the structured questionnaire independently in the workplace during their available time. The researcher remained available to clarify any queries without influencing participants' responses. Upon completion of the questionnaire, educational pamphlets regarding Kangaroo Mother Care were distributed, and a brief educational discussion was conducted whenever requested by the participants.

Ethical Considerations - Ethical approval was obtained (*IEC/ HMPCMCE/ 108/ Faculty/ 8*) from the Institutional Ethics Committee before initiation of the study. Written informed consent was obtained from each participant prior to data collection. Participation was voluntary, and participants were informed of their right to withdraw from the study at any stage without any consequences. Confidentiality and anonymity were maintained by not recording participants' personal identifiers on the questionnaire. Data were used solely for research purposes and stored securely throughout the study.

Statistical Analysis - The collected data were entered into Microsoft Excel and analysed using IBM SPSS Statistics. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize demographic characteristics and knowledge scores. Inferential statistics were applied to examine the association between knowledge scores and selected demographic variables. Independent samples t-test was used for dichotomous variables, while one-way analysis of variance (ANOVA) followed by appropriate post hoc tests was used for variables with more than two categories. A p-value of less than 0.05 was considered statistically significant.

3 RESULT:

Finding 1: Participant Characteristics

Table 1. Sociodemographic Characteristics of Participants

Characteristic	Category	n	%
Age (years)	20–30	134	75.7
	30–40	25	14.1
	40–50	15	8.5
	50–60	3	1.7

Table 1. Sociodemographic Characteristics of Participants

Characteristic	Category	n	%
Gender	Female	174	98.3
	Male	3	1.7
Educational Qualification	ANM	67	37.9
	GNM	92	52.0
	Basic B.Sc. Nursing	16	9.0
	Post Basic B.Sc. Nursing	2	1.1
Clinical Experience	<1 year	40	22.6
	1–5 years	89	50.3
	5–10 years	22	12.4
	≥10 years	26	14.7
Healthcare Facility	Pediatric Hospital	98	55.4
	Pediatric Clinic	6	3.4
	Obstetric Hospital	71	40.1
	Obstetric Clinic	2	1.1
Formal KMC Training	Yes	77	43.5
	No	100	56.5

A total of 177 nurses participated in the study. The majority were aged 20–30 years (75.7%), followed by 30–40 years (14.1%). Most participants were female (98.3%). Regarding educational qualification, 52.0% had completed Diploma in General Nursing and Midwifery (GNM), while 37.9% were Auxiliary Nurse Midwives (ANM). Approximately half (50.3%) had 1–5 years of clinical experience. Most respondents worked in pediatric healthcare facilities (58.8%), and 43.5% had received formal training in Kangaroo Mother Care (KMC).

Finding 2: Overall Knowledge Score

Table 2. Descriptive Statistics of Knowledge Score

Variable	N	Mean ± SD	Minimum	Maximum
Knowledge score	177	13.03 ± 3.54	2	19

The participants obtained a mean knowledge score of 13.03 ± 3.54 , with scores ranging from 2 to 19, indicating a moderate level of knowledge regarding Kangaroo Mother Care among the respondents.

Finding 3: Formal KMC Training and Knowledge Score

Table 3. Comparison of Knowledge Scores According to Formal KMC Training

Formal KMC Training	n	Mean ± SD	Mean Difference	t-value	p-value
Yes	77	13.87 ± 3.45	1.48	2.81	0.006
No	100	12.39 ± 3.50			

Independent samples t-test; $p < 0.05$ considered statistically significant.

Participants who had received formal KMC training demonstrated a significantly higher mean knowledge score (13.87 ± 3.45) compared with those who had not received formal training (12.39 ± 3.50). Independent samples t-test revealed that this difference was statistically significant ($t = 2.81, p = 0.006$), suggesting that formal KMC training was associated with improved knowledge scores.

Finding 4: Educational Qualification and Knowledge Score

Table 4. Comparison of Knowledge Scores According to Educational Qualification

Educational Qualification	n	Mean $\pm$ SD
ANM	67	11.37 ± 3.91
Diploma in General Nursing and Midwifery (GNM)	92	14.28 ± 2.71
Basic & Post Basic B.Sc. Nursing	18	12.83 ± 3.47

Test	Value
F-value	15.22
p-value	<0.001

A statistically significant difference in knowledge scores was observed among participants with different educational qualifications (ANOVA: $F = 15.22, p < 0.001$). Nurses holding a Diploma in General Nursing and Midwifery (GNM) achieved the highest mean score (14.28 ± 2.71), followed by Basic/Post Basic B.Sc. Nursing (12.83 ± 3.47) and ANM (11.37 ± 3.91). Post hoc analysis showed that GNM-qualified nurses scored significantly higher than ANM nurses ($p < 0.001$).

4. DISCUSSION:

The present study assessed the knowledge and practice regarding Kangaroo Mother Care (KMC) among staff nurses working in pediatric and obstetric healthcare facilities in Anand city. Overall, the findings demonstrated that most participants possessed good to excellent knowledge and practice regarding KMC. Formal KMC training and educational qualification were significantly associated with higher knowledge scores, whereas age, gender, clinical experience, and type of healthcare facility were not significantly associated with knowledge levels. These findings suggest that professional education and structured KMC training play a more important role in improving KMC-related competencies than demographic or workplace characteristics.

Knowledge and Practice Regarding KMC - The majority of staff nurses demonstrated good or excellent knowledge and practice regarding KMC, indicating satisfactory awareness of its principles and clinical application. This finding may reflect the increasing emphasis placed on neonatal care within nursing education programmes and institutional policies promoting evidence-based newborn care. Nevertheless, a small proportion of participants exhibited average or poor knowledge and practice, highlighting the continuing need for regular educational interventions and competency-based training. Similar findings have been reported by previous studies, which observed that although healthcare professionals generally possess satisfactory knowledge of KMC, important gaps remain in practical implementation and adherence to standard protocols.

Formal KMC Training - One of the most important findings of the present study was that staff nurses who had received formal KMC training achieved significantly higher knowledge scores than those without formal training. This finding reinforces the importance of structured educational programmes in improving healthcare professionals' understanding and implementation of KMC. Formal training provides opportunities for updating evidence-based knowledge, improving clinical skills, and enhancing confidence in counselling parents regarding KMC. Similar observations have been reported by several national and international studies, which demonstrated that regular in-service education and competency-based training significantly improve healthcare providers' knowledge, confidence, and compliance with KMC guidelines.

The present findings therefore support the integration of regular refresher training and continuing nursing education programmes to strengthen KMC implementation across healthcare settings.

Educational Qualification - Educational qualification was significantly associated with knowledge scores. Participants possessing Diploma in General Nursing and Midwifery (GNM) qualifications achieved significantly higher scores than ANM-qualified participants. This difference may be attributed to the broader curriculum, greater clinical exposure, and increased emphasis on maternal and neonatal care within diploma-level nursing education. Higher educational preparation enables nurses to better understand evidence-based neonatal interventions and apply current clinical recommendations in practice. Similar associations between educational qualification and knowledge of neonatal care have been reported in previous studies, suggesting that professional education remains an important determinant of clinical competence. These findings highlight the importance of strengthening neonatal care and KMC components across all nursing education programmes.

Demographic Variables Not Associated with Knowledge - The present study found no statistically significant association between knowledge scores and participants' age, gender, clinical experience, or type of healthcare facility. These findings indicate that demographic characteristics alone do not necessarily influence KMC knowledge and practice. Although experienced nurses may have greater clinical exposure, updated knowledge appears to depend more on continuing professional education and formal training than on years of service. Similarly, nurses working in pediatric and obstetric healthcare facilities demonstrated comparable knowledge levels, possibly reflecting standardized institutional policies and clinical guidelines regarding newborn care.

4.1 NURSING IMPLICATION:

The findings of the present study have important implications for nursing education, clinical practice, and healthcare policy. Regular competency-based KMC training programmes should be incorporated into continuing nursing education to ensure that all healthcare professionals maintain current knowledge and skills. Nursing curricula should strengthen practical teaching of KMC through simulation, supervised clinical practice, and evidence-based learning approaches. Healthcare institutions should establish standardized KMC protocols, conduct periodic competency assessments, and promote supportive supervision to improve adherence to recommended practices. Furthermore, hospital administrators should facilitate continuous professional development opportunities to enhance the quality of neonatal care and improve newborn outcomes.

4.2 STRENGTHS AND LIMITATIONS:

The present study has several strengths. It included staff nurses from both paediatric and obstetric hospitals and clinics, providing a comprehensive assessment of Kangaroo Mother Care (KMC) knowledge and practice across different clinical settings. The inclusion of an adequate sample size ($n = 177$) enhanced the reliability and representativeness of the findings. Furthermore, data were collected using a validated structured questionnaire, which improved the content validity and consistency of the assessment.

However, certain limitations should be acknowledged while interpreting the findings. The study employed a convenience sampling technique, which may have introduced selection bias and limited the representativeness of the sample. Knowledge and practice were assessed using a self-reported questionnaire, making the findings susceptible to response and social desirability bias. As the study was conducted in selected private hospitals and clinics within a single city (Anand), the findings may not be generalizable to other geographical regions or government healthcare settings. Additionally, the cross-sectional design limited the ability to establish causal relationships between demographic characteristics and knowledge or practice regarding KMC. Future multicentre studies using probability sampling and longitudinal or interventional designs are recommended to strengthen the generalizability and applicability of the findings.

4.3 RECOMMENDATION:

The findings of this study support the need for regular competency-based KMC training, continuing nursing education, and standardized institutional protocols to strengthen evidence-based KMC practice. Nursing curricula should incorporate more practical and simulation-based KMC training to enhance competency among future nurses. Healthcare institutions should conduct periodic competency assessments and clinical

audits to ensure adherence to KMC guidelines. Future multicentre and interventional studies are recommended to evaluate the long-term impact of educational programmes on KMC practice and neonatal health outcomes.

5 CONCLUSION:

The present study demonstrated that the majority of staff nurses possessed good to excellent knowledge and practice regarding Kangaroo Mother Care. Formal KMC training and higher educational qualification were significant predictors of better knowledge, whereas age, gender, clinical experience, and healthcare facility type were not associated with knowledge levels. These findings emphasize the importance of structured educational programmes and continuing professional development in strengthening evidence-based KMC practice. Regular in-service training, standardized institutional protocols, and enhanced integration of KMC into nursing curricula are recommended to improve the quality of neonatal care and promote optimal newborn health outcomes.

CONFLICT OF INTEREST:

The authors declare that they have no known financial, professional, or personal conflicts of interest that could have influenced the work reported in this study.

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