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Evaluation Pre-Intervention Knowledge on Kangaroo Mother Care Among Postnatal Mothers

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Abstract

Background: Neonatal morbidity and mortality remain major public health challenges, especially in preterm infants and low birth babies. A straightforward, economical, and empirically supported intervention that has been shown to enhance neonatal outcomes is Kangaroo Mother Care (KMC). However, mothers' awareness and comprehension are crucial to its successful implementation. To identify knowledge gaps and develop effective educational interventions, it is crucial to evaluate postnatal mothers' current level of knowledge regarding KMC.

Methodology: A descriptive pre-interventional study was led among 70 mothers admitted to the postnatal ward of a selected hospital. A non-probability convenience sampling method was used to choose the participants. A systematic knowledge questionnaire and a structured sociodemographic proforma were used to gather data in order to evaluate pre-intervention knowledge of KMC. Descriptive statistics with number and percentage distribution, were used to analyse the data.

Results: The findings revealed that most postnatal mothers belonged to the younger age group and had primary-level education. Most mothers were housewives and resided in joint families. Assessment of existing knowledge showed that 66 (94.30%) mothers had inadequate knowledge regarding KMC, while 4 (5.70%) mothers had moderate knowledge. None of the participants demonstrated adequate knowledge prior to the intervention. The results clearly indicate a wide gap in awareness related to the concept, benefits, and practice of KMC among postpartum mothers, emphasizing the need for early identification of knowledge deficits before planning educational interventions.

Conclusion: The study concludes that postnatal mothers had inadequate baseline knowledge regarding KMC. This highlights the need for structured and focused educational programmes during antenatal and postnatal periods. Strengthening maternal education on KMC is crucial for improving awareness, promoting effective practice, and ultimately enhancing neonatal health outcomes.

Keywords: Kangaroo Mother Care, Maternal Knowledge, Postnatal Period, Neonatal Care, Health Education

Introduction

Infant mortality is a major public health concern, particularly in developing nations, where a substantial proportion of neonatal demises occur during the early days of life. Low birth mass

and preterm delivery are major causes of newborn morbidity and death worldwide, and postnatal infants who are unable to adapt effectively to the external environment are at increased risk (1). Infants born prematurely or with low birth weight are highly vulnerable to complications such as hypothermia, infections, respiratory distress, poor feeding, and delayed growth, which significantly increase the risk of death during the neonatal period (2). These risks are further aggravated in low-resource settings where access to advanced neonatal care facilities is limited. Low birth weight infants, especially those weighing less than 2.5 kg at birth, account for a considerable proportion of neonatal deaths worldwide. Evidence suggests that more than 20 million newborns are born with low birth weight every year, and over 96% of these births occur in developing countries (3). Conventional neonatal care for such infants often requires incubators, skilled health professionals, and continuous logistical support, which may not be feasible in many healthcare settings due to financial and infrastructural constraints (1). Therefore, there is a critical need for simple, profitable, and proof-based interventions to improve neonatal survival.

Kangaroo Mother Care (KMC) is one such intervention that has gained global recognition for improving outcomes among preterm and low birth weight infants. KMC is defined as a method of care that involves primary, continuous, and long skin-to-skin contact between the mother and her newborn, along with number and exclusive breastfeeding and early discharge from the hospital when appropriate (4). This approach promotes thermal regulation, supports optimal nutrition, enhances mother and infant bonding, and reduces the risk of infection. Unlike conventional neonatal care, KMC does not rely on sophisticated equipment and can be effectively implemented in resource-limited settings (2). The importance of KMC has been strongly emphasized by the World Health Organization (WHO). According to WHO recommendations, KMC should be initiated as soon as the newborn is clinically stable and is particularly recommended for infants weighing 2000 g or less at birth (3). Since it has been demonstrated to lower infant morbidity and death, increase breastfeeding rates, and encourage early departure from medical institutions, continuous KMC is recommended wherever feasible. Intermittent KMC is advised as a superior substitute for traditional treatment when continuous KMC is not practical. These recommendations highlight KMC as a vital component of newborn care, especially in low- and middle-income countries.

Despite strong proof supporting its effectiveness, the implementation of KMC remains inconsistent. Several studies have reported that knowledge and awareness regarding KMC among mothers are often inadequate, particularly in developing regions (5,6). Limited awareness, cultural beliefs, lack of counselling by health professionals, and insufficient education during antenatal and postnatal periods contribute to poor understanding and practice of KMC among mothers. Since mothers play a main role in the effective application of KMC, their knowledge and acceptance of this method are crucial for its effectiveness (7). Although antenatal education is important in preparing mothers for newborn care, postnatal education is equally essential, especially for mothers of preterm and low birth weight infants. The postnatal period provides a critical opportunity for healthcare providers to educate mothers about this care system, demonstrate proper techniques, and reinforce the benefits of

sustained practice both in the hospital and at home. Studies indicate that mothers who receive structured information and guidance during the postnatal period are more likely to understand and adopt KMC effectively (8).

Given the high burden of neonatal mortality and the proven benefits of KMC, assessing the existing level of knowledge among postnatal mothers becomes imperative. The present study is essential to understand the existing level of knowledge regarding this care system among postpartum mothers. KMC is a tried-and-true, inexpensive, and useful technique for increasing the survival of low birth weight and preterm children, but its practical application mostly depends on the mother's awareness and understanding. Many postpartum mothers may not be adequately informed about the concept, benefits, and correct practice of KMC, particularly in countries with limited resource. Identifying the proportion of mothers with inadequate or limited knowledge helps in recognizing the existing awareness gap. Assessing baseline knowledge is necessary to plan and implement appropriate educational and training interventions. Therefore, this study is important to generate evidence on the need for structured teaching and counselling on KMC during the postnatal period.

Materials and methods

Study Design and Settings

This descriptive pre-interventional research was carried out at a particular Uttar Pradesh hospital's postnatal ward. Our study assessed about postpartum mothers' current understanding of KMC prior to the introduction of a structured educational program. A total of 70 postnatal mothers were selected for the study using a non-probability convenience sampling technique. The study setting provided routine maternity and newborn care services, and data collection was carried out in a hospital-based environment (9).

Inclusion and Exclusion Criteria

The study included postpartum mothers who had given birth to live infants and were admitted to the postnatal ward when the data collected. Mothers who were clinically stable, willing to participate, and able to understand the purpose of the study were included. Mothers who could comprehend the goal of the study, were eager to participate, and were clinically stable were enrolled. Mothers of both normal vaginal delivery and caesarean section were considered eligible. Postnatal mothers whose babies were clinically stable and eligible for KMC were included in the study. Mothers who were critically ill, unwilling to participate, or unable to communicate effectively were excluded from the study. Postnatal mothers whose newborns had major congenital anomalies, severe medical complications, or required admission to intensive neonatal care units were also excluded.

Assessment Tool and Data Collection Procedure

Data were collected using organized demographic proforma designed to gauge the mothers' baseline understanding of KMC which were used to gather data. Age, education, occupation, family type, income, obstetric information, and newborn characteristics were all included in the demographic proforma. Multiple-choice questions about the definition, elements,

advantages, and application of KMC made up the knowledge questionnaire. Each participant gave their well-versed consent before any data was collected. Direct interviews were used for the pre-intervention knowledge assessment. Descriptive statistics, such as frequency and percentage distribution, were used to analyse the gathered data to characterize the demographic factors and current state of knowledge (10). The institutional ethical committee granted ethical approval, and participant confidentiality was always upheld.

Results

The results of the present study was based data collection from 70 postnatal mothers and the findings are organized to describe the socio-demographic features of the participants with their existing level of knowledge regarding KMC prior to the intervention. The data were analysed using descriptive statistics which illustrated the distribution of variables and knowledge levels among the postnatal mothers.

Distribution according to Socio-Demographic Characteristics

The socio-demographic characteristics of the postnatal mothers are presented in **Table 1**. Among 70 postnatal mothers, the majority 47 (67.14%) belonged to the age group of 18–25 years, followed by 19 (27.14%) in the age group of 26–30 years, while only 4 (5.71%) were between 31–40 years. Out of all Parti pants, 42 (60%) mothers were Hindu and 28 (40%) were Muslim. With respect to occupation, all 70 (100%) postnatal mothers were housewives. In relation to family type, 48 (68.57%) mothers belonged to joint families, whereas 22 (31.42%) belonged to nuclear families. Concerning monthly family income, 32 (45.71%) mothers had an income of Rs. 5,001–10,000, while 18 (25.71%) each belonged to income groups below Rs. 5,000 and Rs. 10,001–20,000 respectively. Regarding newborn characteristics, 35 (50%) babies had a birth weight of 1.5–2 kg, followed by 15 (21.42%) babies each in the 1–1.5 kg and 2–2.5 kg categories. Most babies were female 39 (55.71%), while 31 (44.28%) were male. With respect to the type of delivery, 31 (44.28%) mothers had normal delivery with episiotomy, 30 (42.85%) underwent LSCS, and 9 (12.85%) had normal vaginal delivery. The main source of information regarding Kangaroo Mother Care was health workers, as reported by 49 (70%) mothers (**Table 1**).

Table 1: Number and percentage distribution of postpartum mothers according to socio-demographic variables (n = 70)

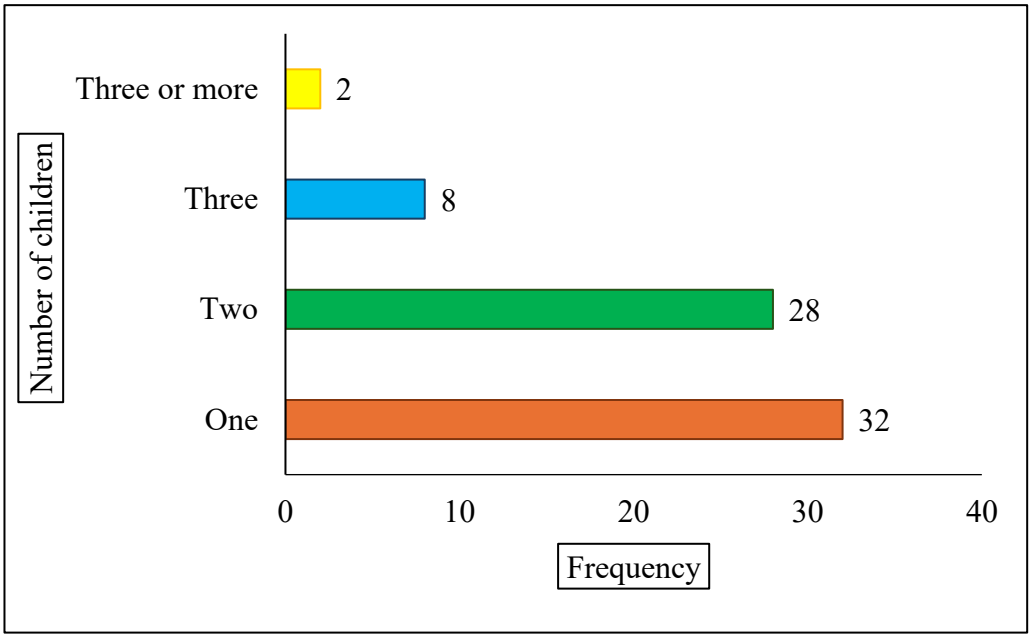
Socio-demographic Variable		Frequency	
		N	F
Age of mother	18–25 years	47	67.14
	26–30 years	19	27.14
	31–40 years	4	5.71
Religion	Hindu	42	60
	Muslim	28	40
Occupation	Housewife	70	100
Family Type	Nuclear	22	31.42
	Joint	48	68.57

Income	Below Rs. 5,000	18	25.71
	Rs. 5,001–10,000	32	45.71
	Rs. 10,001–20,000	18	25.71
Baby weight	1–1.5 kg	15	21.42
	1.5–2 kg	35	50
	2–2.5 kg	15	21.42
	<2.5 kg	5	7.14
Gender	Male	31	44.28
	Female	39	55.71
Delivery	Normal	9	12.85
	LSCS	30	42.85
	Normal with episiotomy	31	44.28
Source	Print media	16	22.85
	Electronic media	3	4.28
	Health workers	49	70
	Family/Relatives	2	2.85

Distribution of Mothers According to Parity

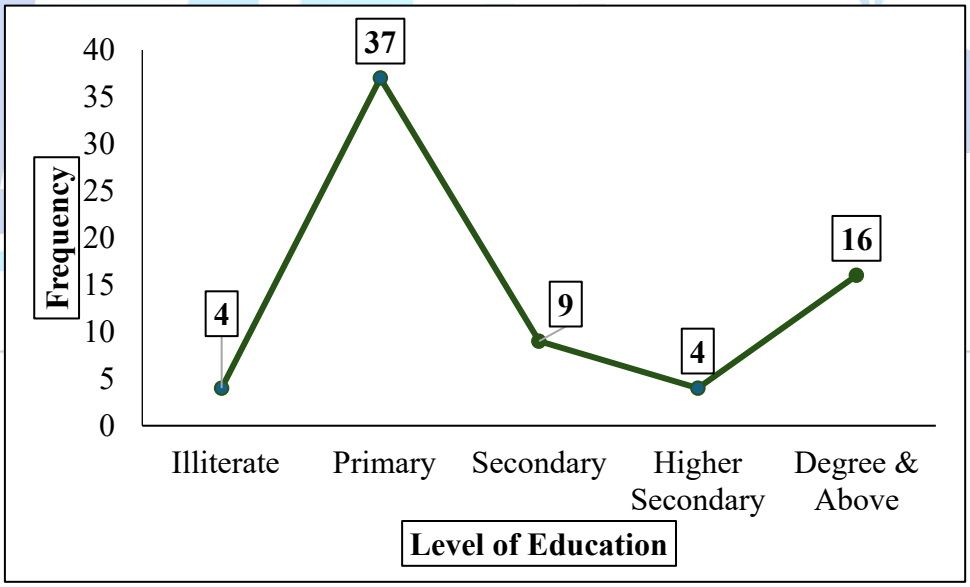
Our study also studied the pattern of postnatal mothers based on the parity they had. Our study showed most mothers had one child, indicating that most participants were primiparous **(Figure.1)**. This was followed by 28 mothers who had two children, had three children, while only 2 mothers reported having three or more children. The distribution suggests that most mothers were in the early stages of motherhood, which may influence their level of exposure and experience regarding newborn care practices such as Kangaroo Mother Care (**Figure 1**).

Figure 1: Distribution of postpartum moms according on the quantity of children



Educational Profile of Postpartum Mothers

Our study also illustrated the educational status of postnatal mothers included in the study. The graph indicates that the highest number of mothers had completed primary education, forming the largest educational group **(Figure.2)**. This was followed by mothers (16) who had degree level and above education. A smaller proportion of mothers (9) had completed secondary education, while only 4 mothers had higher secondary education. Additionally, 4 mothers were illiterate. The figure highlights that the majority of mothers had basic or primary-level education, which may contribute to limited awareness and understanding of



KMC (**Figure 2**).

Figure 2: Distribution of Postnatal Mothers by Educational Status

Baseline Knowledge of Kangaroo Mother Care among Postpartum Mothers

We showed the existing level of knowledge regarding KMC among postnatal mothers and this is presented in **Table 2**. The findings reveal that most postnatal mothers 66 (94.30%) had inadequate knowledge regarding this c system. Only 4 (5.70%) mothers were found to have moderate knowledge, while none of the mothers demonstrated adequate knowledge. This distribution clearly indicates a significant lack of awareness and understanding of KMC among the study participants prior to the intervention. The predominance of inadequate

knowledge highlights the limited exposure of postnatal mothers to structured information on KMC. The results emphasize the need for effective educational and counselling strategies to improve maternal knowledge and promote the practice of KMC (**Table 2**).

Table 2: Frequency and percentage distribution of postnatal mothers according to their existing level of knowledge regarding Kangaroo Mother Care (n = 70)

Level of Knowledge	Frequency (f)	Percentage (%)
Inadequate knowledge	66	94.30
Moderate knowledge	4	5.70
Adequate knowledge	0	0.00

Discussions

Our study revealed that a substantial proportion of postnatal mothers had inadequate knowledge about KMC prior to the intervention. Among the 70 postnatal mothers included in the study, the majority belonged to the younger age group and had primary level education. Most of the mothers were housewives and belonged to joint families. The findings further showed that nearly all mothers demonstrated limited awareness about the concept, components, and benefits of KMC. Only a small proportion of mothers had moderate knowledge, while none exhibited adequate knowledge. These results indicate a clear baseline knowledge gap among postnatal mothers regarding KMC. The predominance of inadequate knowledge highlights the need for focused educational interventions during the postnatal period.

This result is reliable with several studies conducted in developing countries, which have reported poor baseline awareness of KMC among postnatal women. A systematic review and meta-analysis conducted in Ethiopia reported wide variations in maternal knowledge of KMC, with a substantial proportion of women demonstrating poor or inadequate knowledge, particularly in hospital-based postnatal settings (11). Similarly, a hospital-based study conducted in South Asia found that only a small proportion of postnatal mothers were aware of the kangaroo method for thermoregulation, indicating significant gaps in newborn care knowledge (12). In the present study, most mothers belonged to the younger age group and had primary level education, which may have influenced their level of knowledge regarding KMC. This finding aligns with earlier studies which reported that lower educational status is significantly associated with reduced awareness and understanding of KMC practices (13). Studies from low- and middle-income countries have consistently shown that mothers with limited formal education are less likely to receive or retain information related to specialized newborn care practices such as KMC (1). Parity also appears to play an important role in maternal knowledge. In the present study, a large proportion of mothers had one or two children, suggesting limited prior experience with newborn care. Similar observations were reported by Sinha et al., who found that primiparous

mothers often lacked adequate exposure to essential newborn care practices, including KMC (14). First-time mothers may depend heavily on health professionals for guidance, and in the absence of structured counselling, their knowledge remains insufficient.

Another important aspect highlighted by the present findings is the limited role of antenatal and postnatal counselling in promoting awareness of Kangaroo Mother Care. Bergh et al. (2012), in their evaluation of KMC services, reported that KMC education was included in antenatal care in only a small number of facilities, resulting in missed opportunities for maternal education (13). Similarly, Gebeyehu et al. (2022) emphasized that despite national and international recommendations, inadequate counselling during antenatal and postnatal periods remains a major barrier to effective KMC practice (11). The predominance of inadequate knowledge observed in the present study also reflects broader systemic gaps in newborn care education. Evidence suggests that while this care system is widely recognized as a cost-effective and lifesaving intervention, its implementation is often limited by insufficient awareness among mothers and inconsistent counselling by healthcare providers (1,13). Studies have highlighted that mothers who do not receive clear explanations and demonstrations during the postnatal period are less likely to understand or practice KMC effectively (11). Another study by Charpak et al. also reported that insufficient maternal knowledge and lack of structured education significantly limit the adoption and continuation of KMC practices (15).

Our findings are agree with existing literature, which consistently reports low baseline knowledge of KMC among postnatal mothers in resource-limited settings. These comparisons strongly support the need for structured and focused educational interventions targeting mothers during both antenatal and postnatal periods to improve awareness and facilitate the adoption of this care practices. The findings of the present study showing a high proportion of postnatal mothers with inadequate knowledge regarding KMC are comparable with reports from several hospital- and community-based studies. Ramanathan and Paul (2001) emphasized that although KMC is simple and effective, its successful implementation depends largely on maternal understanding and acceptance. Their study observed that mothers required repeated counselling and demonstrations to fully comprehend and practice KMC, indicating that baseline knowledge alone is often insufficient (16). This supports the present study findings, where most mothers lacked basic awareness of KMC prior to any structured education.

Similarly, Bergh and colleagues (2012) reported that limited maternal knowledge and poor counselling were major barriers to KMC implementation in low-resource settings. Their evaluation highlighted that many mothers had never heard of KMC before delivery, particularly those with low educational backgrounds. This observation closely aligns with the present study, in which many mothers had only primary-level education and demonstrated inadequate knowledge regarding the concept, components, and benefits of KMC. The predominance of inadequate knowledge observed in the present study is also consistent with findings reported by Boundy et al. (2016) in their meta-analysis. While their review primarily focused on neonatal outcomes, it emphasized that lack of awareness among mothers and caregivers remains a critical challenge in scaling up KMC services. The authors noted that

despite strong evidence supporting KMC, its uptake is often limited due to insufficient education and counselling of mothers during antenatal and postnatal periods (2). This supports the present study's implication that knowledge gaps may hinder effective utilization of KMC.Studies evaluating KMC implementation at institutional levels further reinforce these findings. Jegannathan et al. (2022) demonstrated that even in tertiary care settings, the duration and quality of KMC practice were suboptimal until focused education and motivation strategies were introduced. Their study showed that structured counselling, visual aids, and continuous support significantly improved maternal participation in KMC (17). This comparison highlights that the inadequate baseline knowledge observed in the present study may be attributed to the absence of systematic education and reinforcement strategies for postnatal mothers.

Maternal-related factors such as parity and exposure to antenatal care also appear to influence KMC awareness. Sinha et al. (2021) reported that mothers who received continuous guidance and support were more likely to understand and practice KMC effectively. Their findings suggest that maternal education and support not only improve neonatal outcomes but also enhance maternal confidence and mental well-being (14). In contrast, the present study revealed that most mothers, particularly primiparous women, lacked adequate knowledge, indicating missed opportunities for education during both antenatal and postnatal care. The results of this study are consistent with national and international research that shows postpartum mothers have low baseline knowledge of KMC. The comparison with earlier research makes it abundantly evident that insufficient maternal knowledge is a widespread and enduring problem in a variety of contexts. These results highlight the critical need for organized, nurse-led educational interventions during the postpartum phase in order to close the knowledge gap and encourage successful KMC practices.

CONCLUSION

The present study provides important insight into the existing level of knowledge regarding KMC among postpartum mothers and reveals that a substantial proportion of mothers had inadequate knowledge prior to any educational intervention. Despite strong proof supporting the role of KMC in improving neonatal survival, thermoregulation, breastfeeding, and maternal–infant bonding, awareness regarding its concept, components, and importance remained limited among the study participants. The socio-demographic profile indicated that most mothers were young, had primary-level education, were housewives, and belonged to joint families, factors that may influence exposure to accurate newborn care information. The predominance of inadequate knowledge highlights gaps in maternal education and counselling during antenatal and postnatal care, despite healthcare facilities being key platforms for maternal learning. The findings emphasize the importance of assessing baseline maternal knowledge to identify deficiencies and guide the development of targeted educational interventions. The postnatal period offers a critical opportunity for nurses and healthcare professionals to educate mothers through counselling, demonstrations, and continuous support. Overall, inadequate maternal knowledge remains a significant barrier to the effective utilization of KMC, and strengthening structured maternal education during both

antenatal and postnatal periods is essential to enhance awareness, promote correct practice, and improve neonatal outcomes, particularly in resource-limited settings.

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