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Experience and expression of postnatal mothers practicing kangaroo mother care: A qualitative study

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Abstract

Introduction: Kangaroo Mother Care is a valuable technique recognized for its impact on bonding, breastfeeding, and thermoregulation in newborn infants, transcending considerations of weight, gestational age, or clinical condition.

Objective: This study aimed to assess mothers' feelings and perceptions regarding the implementation of the Kangaroo Mother Care procedure.

Method: In this qualitative investigation, individual interviews were conducted with 25 postnatal mothers who had experienced Kangaroo Mother Care with their infants. While, 12 unique responses were acquired. These interviews served as a means to explore and document the mothers' perspectives on Kangaroo Mother Care. The analysis of field notes identified four themes and one subtheme, which were coded into categorical distinctions.

Results: A total of 25 postnatal mothers, along with their newborns participated in this study. The majority of postnatal mothers fall within the age range of 20–30 years (48%), followed by 30–40 years (40%), Regarding newborn, majority were full-term (64%), followed by premature (28%) The findings revealed several significant outcomes. Mothers reported a marked improvement in their perception of Kangaroo Mother Care, describing reduced pain, enhanced comfort, and an overall positive sentiment. Many expressed that practicing KMC was a novel and delightful experience, marking their first engagement in this procedure. Moreover, a majority expressed a willingness to continue Kangaroo Mother Care in the future, hoping for its continued implementation within hospital settings. This enthusiasm aligns with recognizing Kangaroo Mother Care as a priority in nursing mother care.

Conclusion: In conclusion, the study underscores the potential benefits and positive impact of Kangaroo Mother Care on mother's experience. The findings advocate for the broad implementation of Kangaroo Mother Care as a valuable strategy in neonatal care, offering a holistic approach to improving the well-being of both mothers and newborns. These insights emphasize the importance of promoting and integrating Kangaroo Mother Care into neonatal care protocols, contributing to enhanced neonatal health and maternal satisfaction.

Keywords

Mother, Kangaroo mother care, NICU, mother's feeling, motherhood

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Introduction

The practice of kangaroo mother care (KMC), which involves close skin-to-skin contact between the baby and the mother, is a secure and cost-effective approach with substantial benefits for both mothers and infants compared to traditional incubator care methods.[1]

KMC has a significant impact on the survival and neurodevelopment of newborns, while also fostering a strong bond between mothers and their infants.[2] It is recommended to initiate "KMC" immediately after birth, following the drying, examination, and cutting of the umbilical cord. While traditionally provided to low-birth-weight infants, even full-term newborns can benefit from "KMC" in the initial hours

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post-delivery, promoting bonding, supporting breastfeeding, and reducing the risk of hypothermia.[3]

Skin-to-skin contact during "KMC" is crucial for fostering bonding, promoting breastfeeding, and regulating body temperature in all newborns, regardless of their weight, gestational age, or clinical condition. Studies have demonstrated that "KMC" reduces the severity of infections and promotes peaceful sleep in infants. Furthermore, implementing "KMC" can shorten the duration of hospitalization required for newborns.[4]

Mothers who have practiced "KMC" for their premature infants in the neonatal unit have reported reduced levels of depression and a greater sense of comfort and responsibility in caring for their infants. It is therefore essential to prioritize and promote "KMC" as a means of humanizing parenthood, emphasizing the importance of family needs and the crucial role of parents in infant care. Practical support can alleviate parental stress and enhance their comfort and confidence in caring for their newborns.[5]

Maternal emotions and perceptions regarding "KMC" are closely tied to the challenges faced when a premature child is born and the demands of fulfilling social roles while remaining in a hospital environment. Engaging in "KMC" increases mothers' confidence in caring for their infants, influenced by interactions with the multidisciplinary team.[6] Mothers' experiences with daily infant care foster a sense of love and connection, as they recognize the direct contribution of breastfeeding to their child's growth and development.[7]

From the mothers' perspective, there is a better understanding of the advantages of breastfeeding through "KMC," the growth of their children, and the specific needs of preterm newborns. Therefore, it is crucial for the multidisciplinary team to consider the family as a system when planning care, implementing strategies, and relying on the kangaroo method to support the mother-baby dyad.[8]

KMC is particularly beneficial for low-birth-weight (LBW) babies, helping them maintain warmth and stability, leading to increased growth, reduced severe infections, and fewer episodes of apnea. During "KMC," it is recommended for the baby to be dressed in a cap, socks, diapers, and a front-open sleeveless shirt or soft natural fabric, which not only ensures comfort but also strengthens bonding, reduces stress, and enhances milk supply. Empowering mothers to take an active role in their infant's care through KMC promotes breastfeeding and reduces the risk of neglect and abandonment.[9]

KMC has been demonstrated to be safer than traditional incubator care for stable and small infants. During "KMC," infants are kept warm, and their heart and respiratory rates are monitored, leading to fewer episodes of apnea, bradycardia, and cyanosis. However, it is crucial that "KMC" is demonstrated and supervised by well-trained staff to ensure its safety and effectiveness. Mothers should also be educated about the warning signs to watch for, such as breathing difficulties and cyanosis, to promptly address any potential issues that may arise during "KMC."[1]

Newborn babies who experience illness at birth should be introduced to "KMC" once they have recuperated and their clinical condition has stabilized. Meanwhile, if a small infant remains unstable and requires treatment in an incubator, efforts should be made to provide the infant with breast milk as soon as possible. It is essential for all women who prefer to breastfeed, particularly those engaging in "KMC," to learn how to express breast milk effectively.[10]

A descriptive survey approach was employed, involving a sample size of 100 respondents. The findings revealed that 24% of the surveyed mothers lacked awareness of "KMC" Furthermore, a noteworthy 50% of respondents expressed strong reluctance toward practicing KMC, indicating a prevalent negative perception of the practice among mothers.[11]

Furthermore, a formative study in Northern Ethiopia. utilized a qualitative exploratory approach through focus group discussions also revealed several key barriers identified by health workers regarding the practice of "KMC." These included issues related to infrastructure and equipment availability for "KMC" implementation, staff shortages, and the absence of adequately trained health workers. In addition, there was a noted low level of awareness about "KMC" among stakeholders, along with a lack of support for its implementation. Furthermore, participants highlighted the challenge of mothers having responsibilities for the care of their families, which could potentially hinder their ability to fully engage in "KMC" practices.[12]

The study seeks to address a significant gap in understanding by investigating the experiences and perceptions of postnatal mothers during "KMC" in a setting where it is not routinely practiced within hospital policies. Therefore, this research aims to assess the holistic benefits of "KMC" for newborns in the Kurdistan Region of Iraq, examining its impact on mother-infant bonding. The research was conducted in a local maternity hospital within the Kurdistan Region of Iraq, chosen to represent a diverse range of healthcare settings within the region. This approach ensures a comprehensive exploration of the benefits and challenges associated with the implementation of "KMC."

Materials and methods

Design and study setting

This study used an exploratory qualitative study (inductive approach) utilizing thematic content analysis to delve into the underlying meanings that 25 recently giving birth mothers attributed to "KMC." The exploration extended to understanding their experiences and thoughts, facilitated through individual in-depth interviews.

The study took place from 8 January 2022 to 28 February 2022, with an additional month allocated for the researcher's preparation and training the observer (note-taker) on "KMC."

The implementation of "KMC" in the study was primarily situated in the "Baby Friend" ward, where a concerted effort was made to establish a conducive environment for "KMC" practices. The researcher procured a dedicated "KMC" chair, strategically placed within the "Baby Friend" ward, creating a designated space to facilitate skin-to-skin contact between mothers and their infants. This initiative aimed to enhance the comfort and feasibility of "KMC" implementation, promoting a nurturing atmosphere. In addition, "KMC" practices were also observed in the Neonatal Intensive Care Unit (NICU), acknowledging the specific needs of infants requiring intensive care. The flexibility of "KMC" implementation across these settings allowed for a comprehensive exploration of the challenges and benefits associated with the contextual factors influencing the implementation of this innovative care approach. The researcher conducted the interviews with the mothers during "KMC," while another trained individual acted as the observer, noting facial expressions and taking notes. This setup allowed for a more comprehensive data collection process, with researcher interacting directly with the mothers while the observer focused on capturing nonverbal cues and additional details. This approach enhances the reliability and depth of the study's findings by incorporating both verbal and nonverbal information.

Out of the initial 25 participants recruited, the study obtained "12 distinct responses." These responses were gathered from postnatal mothers who actively participated in "KMC" for three sessions. The selection of these 12 responses from the larger pool was a deliberate decision intended to ensure a comprehensive representation of the data while avoiding redundancy. This approach allowed for a diverse range of insights into the feelings and perceptions of mothers regarding the "KMC" procedure. The other 13 participants were not excluded from the study entirely; rather, their responses were not included in the final analysis due to the saturation of themes and redundancy of their feelings and perceptions with those of other participants.

Consent and ethical consideration

Ethical approval for this study was obtained from Scientific Committee and approved by the Ethical Committee at the Department of Nursing, Sulaimani Polytechnic University (No. 1/19/10/2022). The subjects provided written informed consent before participating in the study. For illiterate participants, consent was obtained from their husbands or other legally authorized representatives in writing.

Written informed consent was filled out for volunteer participants without requesting their names, address, and telephone number. Women were free to leave the study at any time they desired. Participation was voluntary, and a written informed consent (Appendix 2) document accompanied the sociodemographic questionnaire (Table 1). All maternal perceptions were recorded using a tape recorder after obtaining verbal permission.

The informed consent process involved a verbal explanation of the study details by trained research personnel fluent in Kurdish. Participants were given the opportunity to ask questions and seek clarification. After understanding the study requirements and potential risks and benefits, participants were asked to provide written consent. In addition, the husbands of the illiterate participants or other legally appointed representatives provided written approval. The researcher ensured that participants had sufficient time and were participating voluntarily. It is important to note that no relationship was established prior to the commencement of the study. All information collected during the research period was stored with the utmost confidentiality.

Sampling technique

In qualitative data collection, purposive sampling involved face-to-face single interviews with 25 mothers conducted by the researcher, accompanied by note-taker observations. The participant selection for this study was intentionally focused on mothers of neonates who required "KMC" intervention. This decision was made based on several considerations related to the specific context of the study.

The primary focus on mothers was driven by the unique circumstances surrounding the implementation of "KMC" within the study site. As the "KMC" procedure was newly introduced and facilities for its implementation were limited, the initial emphasis was placed on the mothers who were directly involved in the "KMC" intervention for their neonates.

An intervention was administered to all participating mothers, consisting of an informative video about "KMC," breastfeeding, and the effects of skin-to-skin care for both mothers and babies. However, saturation was reached after analyzing the transcripts of 12 mothers. Theoretical saturation, as suggested by Charmaz.[13] Once theoretical saturation was reached with the 12 transcripts, where participants' responses became repetitive and no new themes *emerged*, data collection ceased as thematic saturation had already been achieved.[14]

The interview guide (Appendix 1) covered topics related to the knowledge, attitude, and skills of postnatal mothers concerning "KMC." Each participant was given sufficient time to provide demographic data after giving birth, including age, residency, educational level, occupation and parity.

Inclusion criteria

The included participants were: all the neonates born in Maternity Teaching Hospital and their mothers (Table 1), those who were willing to participate, and those who were willing to demonstrate or practice "KMC."

Exclusion criteria

Critically ill babies, critically ill mothers, and those with congenital anomalies, and unwilling mothers were excluded

Table 1. Distribution of the mother and newborn demographic characteristics.

Characteristics (postnatal mother)	Frequency, $N = 25$	Percent (%)
Mother age/years		
18–20 years	3	8
20–30 years	12	48
30–40 years	10	40
Residency		
Rural	2	8
Urban	16	64
Suburban	7	28
Educational level		
Illiterate	4	16
Read and write	4	16
Secondary educated	7	28
Preparatory educated	4	16
Highly educated	6	24
Employment		
Employee	4	16
Housewife	21	84
Parity		
Prime	7	28
Low multi para (1–3)	14	56
Grand multi para (4–8)	4	16
Natality		
Premature	7	28
Full-term	16	64
Postmature	2	8
Birth weight (g)		
<1500	2	8
1500–2000	2	8
2000–2500	5	20
2500–3500	16	64
Gender		
Male	15	60
Female	10	40

from the study. The inclusion of fathers in the study posed logistical challenges due to constraints in private spaces within the healthcare setting, including the limited availability of designated areas for "KMC."

Data collection

The interviews were conducted in both the maternity ward and the NICU by the Training Facility Center—Department of Health. The interviewer, a researcher holding a PhD and trained at the University of Plymouth in the United Kingdom. The facilitators, who were trained in pediatric nursing and KMC, received their training from the researcher herself, who has expertise in these areas. At the outset, the researcher introduced herself and the observer to the mothers, providing a comprehensive overview of the entire procedure. The mothers participated in three consecutive sessions of interviews. The first session was conducted for obtaining consent and collecting sociodemographic data. In the second session, the focus was on preparation, during which they were shown videos and received training on effectively implementing "KMC." The third session, dedicated to the study itself, lasted a minimum of 30 min. "KMC" was applied with the mother's bare chest, and the newborn wore only a diaper, with the baby's head and back covered.

To facilitate "KMC," mothers were instructed to wear any front-open light dress, while babies were dressed in a cap, socks, and a diaper without any additional garments. The infant was positioned upright within the mother's apparel, against the exposed skin of the chest and abdomen, using a specially made "KMC" bag. The baby's head was turned to one side in a slightly extended position, encouraging eye-to-eye contact between the mother and baby. The hips were kept flexed and abducted in a "frog" position, and the arms were also flexed. The baby was allowed to suckle at the breast as often as desired.

In-depth interviews were conducted with the participating mothers, capturing their perspectives on the implementation of "KMC." Each interview session was audio-recorded, allowing for the preservation of participants' voices, nuances, and emotional expressions. The decision to record interviews was made to ensure the accuracy and completeness of data, facilitating a detailed qualitative analysis.

Following the interviews, the recorded data underwent a meticulous transcription process. The audio recordings were transcribed verbatim, converting spoken words into written text. This step was essential for preparing the data for subsequent analysis and interpretation.

The researcher developed the demographic questionnaire following an extensive and scientific literature review. As an academic nurse from the same cultural background, the researcher's involvement added rigor and transparency to the process. The researcher can provide a nuanced interpretation of the data within the cultural framework, offering a deeper understanding of how cultural factors influence the phenomena being studied. The involvement of an academic nurse from the same cultural background enhances rigor and transparency by fostering cultural sensitivity, trust, reduced bias, facilitated participant engagement, and accurate contextualization of findings within the cultural context. To ensure accurate and unbiased result, a qualified researcher, who is bilingual in both Kurdish and English undertook the interview, transcription, translation, and analysis.

Field notes, recorded by the observer, underwent transcription and received similar treatment. These could involve the researcher directly observing and recording behaviors, interactions, and events in a naturalistic setting. The field notes recorded in Kurdish language to capture authentic expressions and nuances. The focus was on the researcher's reflections or thoughts during an observation, the field notes recorded in the researcher's primary language (Kurdish).

A pilot study was conducted on a sample of (10) mother at Maternity Teaching Hospital in Sulaimani City. It was

carried out from first to eighth of January 2022. The sample of pilot study excluded from the present study sample helped ensure the integrity, validity, and generalizability of the main study's findings.

The framework for interview questions within the interview guide (Appendix 1) was based on review of extensive literature about KMC and the findings of a preliminary (pilot) study in which (10) mothers were interviewed at the Maternity Teaching Hospital in Sulaimani City to test the feasibility and practicality of their methods before implementing them on a larger scale and determine the clarification of the questionnaire items for the respondents, based on subjective understanding. Also, the outcome of the pilot study served as the foundation for this qualitative analysis.

Data analysis

The data were analyzed through the following steps:

- These recordings were meticulously transcribed, and transcripts were carefully reviewed and analyzed throughout the data collection period. In addition, detailed field notes were taken by the observer and transcribed to ensure a thorough documentation of the data.
- Following the transcription process, the data were translated from Kurdish to English by the bilingual researcher. This translation step was crucial for ensuring accuracy and capturing the cultural and contextual nuances present in the mothers' perceptions of KMC.
- Thematic content analysis was then employed to explore the depth of mothers' emotional experiences during "KMC." In addition, field notes were utilized to extract key themes and insights from the data, with subjects being categorized into distinct groups.
- The analysis phase was rigorous and systematic. Interviews were transcribed in full, and thematic content analysis was employed to identify recurring themes, patterns, and key insights related to "KMC." This approach allowed for a nuanced exploration of mothers' experiences with "KMC," focusing on aspects such as bonding, comfort, and perceived benefits.
- To enhance the organization and interpretability of the data, a coding system was utilized. Relevant passages were coded based on emerging themes and patterns, and these codes were then categorized into broader themes. This process facilitated a comprehensive understanding of the diverse aspects of maternal experiences with "KMC."
- Interpretation and synthesis of the coded data were conducted to derive meaningful conclusions and insights. Researchers engaged in a reflective process, considering the implications of the findings within the study context and the broader literature on "KMC."
- To ensure the credibility of the study's conclusions. Key findings were presented to participants for verification, validating the accuracy, and authenticity of the data.
- Overall, the study employed a robust methodology to capture and analyze mothers' experiences with "KMC" comprehensively. The findings contribute to the understanding of KMC implementation and its impact on maternal and infant well-being in the Kurdistan Region of Iraq.
- The data analyzed and controlled to enable the identification of themes. In addition, combined the notes with the interview transcripts to identify the reality of their feeling. Re-listening to the audio file to confirm the competence of the data.

Results

Themes and subthemes

1.Opinion of mother about KMC

1.1 Words used to describe KMC

1.2 Expression of motherhood

2. Positive aspects of KMC

3. Barrier experiencing KMC

4. Implementation of KMC practices

Participant demographics

In the study, a total of 25 postnatal mothers, along with their newborns, participated. The majority of postnatal mothers fell within the age range of 20–30 years (48%), followed by 30–40 years (40%), with only a small percentage were aged 18–20 years (8%). Most postnatal mothers lived in urban areas (64%). A significant portion of mothers were housewives (84%), with varying levels of education, ranging from illiterate to highly educated, while a small percentage were employees (16%). The largest group of mothers had a low multipara status (1–3 children; 56%), followed by prime parity (28%) and grand multipara status (4–8 children; 16%).

Regarding newborns, the majority were full-term (64%), followed by premature (28%) and postmature (8%). The majority of newborns weighed between 2500 and 3500 g (64%), followed by 2000–2500 g (20%), less than 1500 g and between 1500 and 2000 g (both 8%). There was a higher proportion of male newborns (60%) compared to female newborns (40%).

The participant's data received several themes, including:

Opinion of mothers on KMC

Words used to describe "KMC.". The mothers were asked to describe "KMC" and the majority expressed feelings of happiness, excitement, and relaxation. Surprisingly, many mothers used positive descriptors such as *"fantastic," "mine," "gorgeous," and "incredible.*" Participant stated,

participant 1(P1) "I feel like I was born again; I'm very happy seeing my child on my chest and breastfeeding."

Furthermore, some mothers pointed out that KMC helped in maintaining the optimal body temperature for their babies. It is evident that most mothers were comfortable and accepting of practicing the "KMC" technique, demonstrating a strong awareness of its benefits.

The researcher asked the mothers how they felt for the first time when they hugged their baby in KMC, to find the words used by the mothers during the process of "KMC." They expressed their feelings through the following sentences:

This participant expresses deep happiness and relief, thanking God and expressing gratitude for the positive experience. The feeling is described as indescribable, indicating a strong emotional response to holding the baby during "KMC" like:

> *Participant 1(P1)*: "I am very happy, thank God, I feel much better; hopefully, it remains like that with your help; I cannot tell you how happy I am right now; I cannot describe that feeling, thanks."

Similarly, with a different feeling, *participant 2 (P2)* describes feeling fantastic, happy, and amazed at the experience of holding the baby. The feeling is characterized as beautiful and nice, suggesting a sense of awe and wonder like:

> *Participant 2 (P2)*: "I feel fantastic and happy; I can't believe I'm holding it; it is a beautiful, nice feeling."
>
> *Participant 3(P3)*: "I feel that the whole world is mine, I feel all of the happiness, I'm very happy and incredible, I feel that I was born now, I'm very happy that I saw my child on my chest and breastfed." Her experience is described as incredible and transformative, evoking feelings of new found joy and fulfillment.

Similar to the other participants, following participants describe feeling a great sensation of happiness and joy while holding the baby during "KMC." The experience is described as incredible, emphasizing the happiness derived from seeing the baby on their chest and breastfeeding, *participant 4 (P4): "I have a great sensation; I feel happy that I see my child on my chest and I see him/her breastfeed and hug him/her, incredible sensation."*

> *Participant 6 (P6)*: "I feel incredible and relaxed, emotionally and physically."
>
> *Participant 7(P7)*: "I feel emotional; I am relaxed."

The researcher excerpted some words said by mothers, which are happy, relaxed, emotional, and physical. The most crucial word some mothers tell is motherhood *as participant 2(P2): "I feel fantastic and happy, I feel like a mother, I feel amazing."*

In addition to the feeling of happiness and comfort, some mothers started to feel their baby's behaviors; at first, the baby was very moveable and not relaxed, but for now, *participant 5(P5) "he/she sleeps well; I'm very happy."*

Mothers also found that life is different from *participant 3(P3): "I feel that the entire world is mine, I feel extremely happy, I'm very happy, I feel that I was born now".*

Some of the mothers added another physiological benefit as they said: this means that this process also makes thermoregulation for not just the baby but also the mother, and expressed as: *participant 11(P11): "I feel very cold, but when I put my baby on my chest I feel warm".*

> *Participant 12(P12): "The mother has the greatest sensation for the baby during KMC; it is a nice feeling, I feel warm, and my baby is very beautiful".*

Expression of motherhood. Motherhood emerges as the most critical aspect highlighted by the mothers, as evidenced by the following quotes:

> *Participant 3 (P3)*: "I feel great; I feel like a mother; I feel that my emotions and feeling are increased with KMC, me, and my baby's emotional well-being."
>
> *Participant 4 (P4)*: "Motherhood feeling is very sensitive; when you see your child, you feel that the entire world is yours."
>
> *Participant 11 (P11)*: "Motherhood is the greatest feeling; I feel fantastic."

In addition, one mother emphasized the spiritual and religious significance of KMC:

> *Participant 7 (P7)*: "Religiously, a female is more understanding of females' feelings, and the Quran asks for breastfeeding until 2 years for better health".

Furthermore, pain relief emerged as another significant aspect of KMC, as expressed by one mother:

> *Participant 11 (P11)*: "Pain is relieved, and my baby was breastfed by KMC, and she was asleep; nursing mother and baby's care is easier with KMC."

Moreover, the calm and relaxed state of the baby were highlighted by another mother:

> *Participant 12 (P12)*: "Baby is calm, feels relaxed, fantastic feeling, and he feeds milk on my breast; it is good."

These quotes underscore the multifaceted benefits of KMC, including its emotional, spiritual, and physical aspects, as perceived by the mothers.

Positive aspects of KMC. When mothers asked about their views on the positivity of KMC, most postnatal mothers expressed positive feelings. They described feeling emotionally stable, comfortable, and less anxious, while nursing their babies through KMC. Furthermore, many of them noted increased confidence in breastfeeding and found that KMC facilitated breastfeeding. In addition, some mothers described feeling that motherhood was a gift, while others expressed spiritual sentiments. One mother even mentioned a reduction in post-delivery pain as a positive aspect of KMC.

The researcher also inquired about the most positive aspects of "KMC" to gain more specific insights and emotional responses from the mothers. Many mothers highlighted the psychological benefits, mentioning that "KMC" helped them release stress and anxiety. For example, *Participant 1 (P1) stated, "My baby is relaxed, and I feel emotionally relaxed without any anxiety. My baby was very restless before, but now he/she sleeps well. I'm very happy, really."*

"KMC" is also perceived as effective, particularly in psychological aspects, as indicated by *Participant 5 (P5)*, *mentioned, "I am more emotional and sensitive."* These sentiments echo the positive impact of "KMC" on maternal well-being and emotional state, further emphasizing its significance beyond physical care.

Barriers experiencing KMC. When mother asked about the obstacles affecting the performance of "KMC," most mothers responded that it takes more than two sessions to learn the technique since their initial introduction to this beneficial measure. On the other hand, a few mentioned experiencing back pain, abdominal pain as *participant 12(P12)*, "*identified pain as a barrier, expressing, 'I experience some pain when practicing this process'*, while others expressed that it consumed 30 min of their time."

In addition to the various feelings and aspects experienced by mothers during the "KMC" process, it is noteworthy that "KMC" is a relatively new practice in this country. Consequently, the barriers expressed by mothers are not extensive. To explore potential obstacles preventing mothers from implementing this process at home, the researcher asked, 'Did you encounter any difficulties or aspects that made KMC challenging for you at home?' One mother, *participant (P2), responded, "Only fear, but after doing it a couple more times, it becomes easy, like a routine, as it was my first time trying it."* Another mother, *participant 11(P11)*, mentioned time as a significant constraint, stating, *"I don't have the time; it takes at least 30 min."*

Participant 12 expressed a significant level of fear and anxiety about her baby and the potential harm to her baby, *"I am afraid something will happen to my baby, that cause hard to my baby's breathing, this is my first baby."* Further panics were hurting the baby's umbilical cord that might result in bleeding due to contact with the mother's body. Another mother was concerned about privacy as she living with extended family.

Expressing concerns about her rest time and sleep quality while practicing "KMC." *Participant 5 (5*) stated, "This position becomes uncomfortable or disrupts my sleep." In addition, some mothers are concerned that practicing "KMC" might lead to excessive bonding between the mother and the baby, potentially causing them to neglect regular duties due to the time spent in close contact. *Participant 8(P8)* mention of "*pressing the baby's stomach and vomiting could indicate worries about potential adverse effects or discomfort associated with KMC."*

Furthermore, mothers have expressed concerns about privacy, particularly when living with extended family members. In such situations, finding a private space for "KMC" may indeed be challenging, as it requires a conducive environment for both the mother and the newborn space for KMC.

Implementation of KMC practices. When asked for suggestions to improve "KMC," the majority of women recommended teaching every mother about "KMC," as it enhances breastfeeding and relaxation. Moreover, most mothers suggested incorporating music and videos about the KMC technique into the process. After the researcher addressed some barriers, they asked for further suggestions to enhance the process by asking, "Can you suggest how the trial could be improved?" Some mothers emphasized the importance of "KMC," with *Participant 1 (P1) stated* the importance of "KMC" by highlighting the exhaustion that mothers endure and the critical role that "KMC" plays in facilitating maternal-infant bonding. *P1* suggested that without KMC, the baby's life expectancy might decrease due to the absence of maternal closeness and care provided through skin-to-skin contact. This underscores the vital role of "KMC" in promoting the well-being and survival of newborns. *"It's very important that KMC is done because the mother gets tired for the whole year, and if we don't have KMC, let the baby remain inside the incubator without feeling her mother, the baby's life expectancy is decreased."*

> *Participant 3 (P3) expressed, "Continuously doing KMC is better; the most compelling aspects are for mothers that feel relaxed, and breastfeeding is more effective for the baby, and the baby is more relaxed with KMC."*

Participant 3 (P3) echoed P1's sentiments and emphasized the benefits of continuous "KMC." Highlighted that continuous "KMC" contributes to maternal relaxation, enhances breastfeeding effectiveness, and promotes the baby's relaxation. This aligns with the understanding that "KMC" provides a nurturing environment that supports both maternal and infant well-being through close physical contact and breastfeeding.

This opinion was also echoed by others, who suggested that continuous "KMC" would be beneficial. As stated by *Participant 4 (P4) "I hope that all women practice KMC and breastfeed their babies to increase their emotional connection."* And emphasized the importance of widespread adoption of "KMC" and breastfeeding. *Participant 4 (P4)* expressed hope that all women would engage in "KMC" and breastfeeding to strengthen the emotional connection between mother and baby, recognizing the significant benefits associated with these practices for maternal-infant bonding and overall well-being.

Regarding participants' religious and spiritual beliefs, *participant 7 (P7) stated, "This project will be improved as an applicable project if all mothers do it, and you will be the supervisor of that project because that's also pointed out in the Quran."* Highlighted the significance of KMC from a religious and spiritual perspective, suggesting that the project would be enhanced if all mothers participated. *Participant 7(P7)* referenced the Quran, indicating a belief in the importance of maternal-infant bonding and care as reflected in religious teachings. This underscores the cultural and religious dimensions of "KMC" adoption and the potential role of faith-based beliefs in promoting maternal and infant health practices.

In promoting KMC practices, *participant 8 (P8)* emphasized the benefits of KMC for both mother and baby, highlighting its ease of implementation and effectiveness in calming the baby. *Participant 8(P8)*'s positive experience and endorsement of "KMC" can serve as a form of peer support for other mothers, encouraging them to adopt similar practices. This highlights the importance of social support networks in promoting maternal-infant bonding and the uptake of beneficial healthcare practices like "KMC."

> *Participant 8 (P8)*: "KMC is a very beneficial way for mother and baby; here I saw that the mother could do that, it's an easy way, and at that moment, it is good, the baby doesn't get irritable with KMC and relax."

Discussion

The topic of KMC and mothers perceptions regarding "KMC" have not been widely researched and implemented in the hospital. This article not only adds depth to existing literature but also offers practical implications by understanding and investigating the experiences and perceptions of postnatal mothers during "KMC" in a setting where it is not routinely practiced within hospital policies.

The attached theories describe dynamically long-standing relations between humans. The most potential theory is that babies must grow a connection with at least one principal caregiver for social/emotional improvement to happen naturally.[15] According to this study, there is a positive effect between the mother and infant's relationships; all the mother's feelings improved psychologically and emotionally. In consistent to this study, a longitudinal case-control study detected that "KMC" has an optimistic influence on bonding and enhanced some features of mother-baby bonding.[16]

Tessier et al.,[17] conducted a randomized controlled trial on 488 babies weighing <2 kg. They examined the skin-to-skin contact in "KMC" and traditional care groups together with the proper reflection of the timing/duration of mother-baby interaction that affects the child's health status at birth and the socioeconomic condition of the parents. The findings from Tessier et al.,[17] provide support for the positive impact of "KMC" on maternal readiness and responsiveness to their baby's needs. Their randomized controlled trial demonstrated that mothers practicing "KMC" exhibited a heightened awareness of their infants and felt more proficient in caring for them, particularly in stressful conditions such as hospitalization. This aligns with our study's findings, which also indicate that mothers who engaged in "KMC" experienced increased confidence and bonding with their newborns.

A quasi-experimental study was performed on 100 mothers examined the impact of "KMC" on maternal bonding in mothers of preterm and LBW infants. The study found that mothers who practiced KMC showed significantly higher levels of maternal bonding compared to those who did not practice "KMC."[18] This aligns with the outcomes of the current study, which also highlighted the beneficial impact of "KMC" on maternal bonding and emotional connection with their newborns. Together, these studies reinforce the importance of KMC as an effective intervention for promoting maternal-infant attachment, especially in populations with vulnerable infants such as preterm and LBW babies.

In contrast to recent study outcomes, which revealed that most mothers were initially apprehensive about trying "KMC" due to fears of hypothermia and decreased oxygenation caused by the frog position of the baby and the baby wearing only a diaper, hat, and socks. However, after receiving information on "KMC," they became willing to practice it and observed firsthand its benefits for thermoregulation. In addition, their babies were comfortable, slept quietly, and were significantly relaxed. This revelation was astonishing for the participating mothers, who expressed gratitude. Consequently, the majority of the mothers revisited daily to repeat "KMC," and they all mentioned their intention to continue practicing it at home continuously.

In addition to experiencing fantastic feelings, the mothers also express profound feelings of fulfillment and joy associated with motherhood. They describe feeling like a mother and emphasize the emotional connection and well-being of both themselves and their babies during "KMC." This highlights the transformative nature of motherhood and underscores the importance of nurturing and caring for their infants. As "KMC" involves skin-to-skin contact between the mother and the baby, it fosters a strong emotional bond. This close physical connection can lead to an increased sense of attachment and maternal bonding. Feeling the baby's

warmth and heartbeat can evoke a deep emotional connection, reinforcing the mother's sense of motherhood.

In this region, "KMC" is a relatively new practice and has not been fully implemented. In addition, in some large families, there may be cultural barriers preventing the implementation of "KMC." Furthermore, mothers have stated that privacy may be a concern when living with extended family members. In such situations, finding a private space for "KMC" may indeed be challenging. However, there are still some strategies mothers can consider to address this issue. This elaboration addresses the challenges mothers may face with implementing "KMC" at home, particularly in regions where "KMC" is a new practice or where cultural barriers exist. It also highlights the concern of privacy, especially in large families or when living with extended family members. A multicountry analysis study of health systems identified bottlenecks and potential solutions in 12 countries in 2015. The authors noted that mothers were initially apprehensive about "KMC" practice, particularly in communities where traditionally babies were carried on the mother's back rather than the chest. However, some parents practiced "KMC" at home when it was suitable for them, albeit not continuously.[19]

Therefore, finding a balance between practicing "KMC" and navigating family dynamics may require some creativity and flexibility. Keep exploring options and communicating with family members to create a supportive environment.

Hence, in this study, after explaining the benefits of "KMC" and providing them with more precautions to prevent any spreading infection, to achieve our goal. Furthermore, doctors believe that KMC is the best practical way for the baby and mother to decrease anxiety and get more benefits from breastfeeding. Early discharge is noticeable for all babies who are given KMC in contrast to the neonates with routine care, especially.[20]

Moreover, a few mother were concerned that practicing "KMC" might lead to excessive bonding between the mother and the baby, in addition, the mention of pressing the baby's stomach and vomiting could indicate worries about potential adverse effects or discomfort associated with "KMC" Thus, they were worried that the "KMC" practice would avert the mothers from restarting regular duties due to extreme bonding, shortage of time, and no family support. This finding is supported by a qualitative study, using semi-structured interviews with 12 healthcare providers and 32 mothers. Barriers to "KMC" implementation were identified, including shortages of supplies and human resources, inadequate space for admissions, limited home visits, insufficient food for mothers, lack of coordination among health services involved in newborn care, increased workload, cultural beliefs regarding chest carrying, resistance from fathers, low rates of exclusive breastfeeding, and lack of community awareness. Facilitators for "KMC" implementation included healthcare provider training, effective leadership, low cost of "KMC," perceived value of "KMC" among healthcare providers, positive relationships between mothers and healthcare providers, mothers' adherence to "KMC," and the ability of KMC units to collaborate with external organizations.[21]

A descriptive survey approach was utilized, with a sample size of 100 respondents chosen through a combination of simple random and convenience sampling methods to assess the hypothesis at a significance level of 0.05. The results indicated a lack of awareness of KMC among 24% of mothers surveyed. In addition, a significant portion (50%) of respondents expressed strong reluctance toward practicing KMC, reflecting a negative perception of the practice among mothers.[22] This aligns with our study's aim of exploring the perceptions and practices of KMC among postnatal mothers and underscores the importance of addressing potential barriers to its implementation.

In addition, some mothers thought that the feeding process was a barrier as the performance of breastfeeding and breast milk appearance hindered the general skin-to-skin contact during the "KMC" process. Whereas some mothers did not have that fear and said that they wanted to only take care of their babies. They stated that they wanted to dedicate their lives to their babies.[23] As this study found that mothers also wanted the baby to be placed on their chest, and feel the baby's breathing and they are crying to express how happy they felt.

However, while many mothers find that "KMC" leads to an uncomfortable sleeping position and inadequate rest. Studies[23,24] in both high and low-income countries have identified supportive factors perceived by parents as beneficial to "KMC." For instance, supportive family members who help with "KMC" tasks such as cooking, fetching water, and caring for other siblings, as well as healthcare providers who offer guidance and follow-ups, are seen as supportive factors. In addition, government policies that allow parents time off work to support "KMC" are also perceived positively by parents.[25,26]

Limitation of study

The study schedule does not give that opportunity to have more participants, Furthermore, the study also was more significant if we did the better interview with the mothers as the mothers are direct care givers of the newborn babies. Mothers were interviewed for "KMC" at initial sessions, before the mother could understand "KMC" better.

Interviews should have been taken from the mothers who had premature baby or a LBW baby at the time of discharge when mother had comprehensive experience of "KMC," hospital environment and support of nursing staff.

"KMC" was provided for minimum of 30 min–1 h against the standard practice of more than 1 h. Selection process was purposive. These all could affect the quality of interview.

Conclusions

The mothers' observations regarding "KMC" were notably positive, indicating significant improvements in their

experience. Many expressed feelings of joy, reduced pain, and increased comfort during the practice of "KMC," despite it being their first encounter with the procedure. This positive reception was consistent across the board, with mothers expressing a strong willingness to continue practicing "KMC" in the future. They regarded it as a priority in the hospital's care regimen for nursing mothers.

As a result of these encouraging findings, this study recommends further exploration into various aspects of the "KMC" technique. Specifically, there is a need for comprehensive economic evaluations to assess the cost-effectiveness of implementing "KMC" in healthcare settings. Additional staff training is recommended to ensure the effective and widespread adoption of "KMC" practices. By conducting further studies and enhancing staff expertise, healthcare providers can maximize the benefits of "KMC" and optimize maternal and infant care outcomes.

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Author contribution

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Ethical approval for this study was obtained from *Scientific Committee and approved by the Ethical Committee at the Department of Nursing, Sulaimani Polytechnic University (No. 1/19/10/2022)*.

Informed consent

The subjects provided written informed consent before participating in the study. For illiterate participants, consent was obtained from their husbands or other legally authorized representatives in writing.

Trial registration

Not applicable.

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Supplemental material

Supplemental material for this article is available online.

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