

# Barriers and Enablers of KMC Implementation in Health Facility and Community of Tigray Region, Northern Ethiopia: Formative Research

Marta Yemane Hadush<sup>1</sup>, Dawit Seyoum Gebremariam<sup>1</sup>, Selemawit Asfaw Beyene<sup>2</sup>, Tedros Hailu Abay<sup>1</sup>, Amanuel Hadgu Berhe<sup>1</sup>, Yibrah Berhe Zelelew<sup>1</sup>, Tirhas Asmelash<sup>3</sup>, Fisseha Ashebir<sup>3</sup>, Samson Yohannes Amare<sup>4</sup>, Znabu Hadush<sup>2</sup>, Araya Abrha Medhanyie<sup>2</sup>

<sup>1</sup>School of Medicine, College of Health Sciences, Mekelle University, Mekelle, Ethiopia; <sup>2</sup>School of Public Health, College of Health Sciences, Mekelle University, Mekelle, Ethiopia; <sup>3</sup>Tigray regional health bureau, Mekelle, Ethiopia; <sup>4</sup>School of Computing, Mekelle University, Mekelle, Ethiopia

Correspondence: Marta Yemane Hadush, Email marsec112@yahoo.com

**Background:** Kangaroo mother care (KMC) is an evidence-based approach to reducing morbidity and mortality in low-birth-weight and preterm newborns. Barriers for KMC and its effective practice at a larger scale are highly affected by contextual factors. The purpose of this study is to explore barriers and enablers in the community and health facilities for implementation and continuation of KMC.

**Methods:** This formative study employed a qualitative exploratory approach using focus group discussions and in-depth interviews in five zones of Tigray region, Northern Ethiopia. A total of 16 focus group discussions and 46 in-depth interviews were conducted with health workers and community members. The whole process of data collection took an iterative approach. An inductive thematic analysis was done by going through the transcribed data using ATLAS.ti software.

**Results:** The current study found that problems of infrastructure and equipment for KMC practice, shortage of staff, and absence of trained health workers as the most frequently mentioned barriers by health workers. Low level of awareness, lack of support, mother being responsible for the rest of the family, holding babies in the front being traditionally unacceptable, and preference of incubators for better care of small babies were among the barriers identified in the community. Presence of community health workers and the positive attitude of the community towards them, as well as antenatal and postnatal care were among the favorable conditions for the implementation of KMC at health facilities and continuation of KMC at home.

**Conclusion:** Empowering health workers through training to identify preterm and low-birth-weight babies, to do follow-ups after discharge, and creating awareness in the community to change the perception of kangaroo mother care are necessary.

**Keywords:** kangaroo mother care, KMC, implementation research, low birth weight, Ethiopia, newborn care, preterm birth, KMC implementation, enablers and barriers to KMC

## Background

Preterm birth is a major global health issue, with 15 million preterm births occurring each year, and over one million of these babies die annually. Preterm birth complications directly account for greater than 35% of all neonatal deaths each year.<sup>1</sup> Kangaroo mother care (KMC), which mainly consists of skin-to-skin contact and exclusive breastfeeding, is a proven intervention shown to be effective at reducing neonatal mortality rates among low-birth-weight (LBW) babies. Studies also show that KMC has positive long-term effect on physical, psychosocial, and behavioral outcomes.<sup>2-4</sup>

Despite the recognition, benefits, and long history of KMC, the uptake and service coverage have not progressed well in many countries. Only few developing countries have made the intervention available and accessible to families with LBW babies.<sup>5</sup> Studies showed that there are several barriers to implementing KMC, including the need for time, social support, medical care, and family acceptance. Barriers within health systems included organization, financing, and service delivery. In the broad context, cultural norms influenced perceptions and the success of adoption of KMC.<sup>6-9</sup> Preference for incubators over KMC is also seen as a challenge, but controlled trials compared with incubators showed

KMC to reduce neonatal mortality, incidence of infection by almost 60%, hypothermia by about 70%, and length of hospital stay (mean difference 2.4 days).<sup>10,11</sup>

Barriers for KMC and its effective practice at a larger scale are highly affected by contextual factors. According to systematic review done on barriers and enablers of health system adoption of KMC, many of the studies done on KMC globally are in developed nations and in urban health facility settings.<sup>12</sup> Few studies have been conducted in rural settings where KMC can be an appropriate and effective intervention.

In low- and middle-income countries, studies that investigated the challenges to KMC practice are limited. Meanwhile, identifying and understanding barriers and favorable conditions in the community and health facility that can make the implementation and continuation of KMC possible will be important to develop an effective delivery model. Hence, the current study aimed to explore the barriers and enablers for KMC implementation at the community and health facility level in Tigray region of Northern Ethiopia.

## Methods

### The Study Setting

The study was conducted in Tigray region, which is one of the nine regional states of the Federal Democratic Republic of Ethiopia located in the northern part of the country. The regional state is divided into seven zones. According to the 2015/16 census projection, the region had a total population of 5,055,999 (49.2% male and 50.8% female). As of 2015/16, the region had reached overall primary health care coverage of 96%, with a total of 712 health posts, 204 health centers, and 20 primary hospitals in 2015/16. In this study ten health facilities were included from five zones of the region.

### Study Design

This KMC implementation formative study took a qualitative approach and employed a participatory approach with two data collection techniques: focus group discussions (FGDs) and in-depth interviews (IDIs).

### Sampling and Sample Size

In consultation with Tigray regional health bureau, one district was selected from each of the five zones for conducting focus group discussions and in-depth interviews with community representatives and health professionals (Table 1).

A total of 16 focus group discussions and 46 in-depth interviews were conducted in the 5 towns and 5 villages included in this formative research. Selection of the locations was based on representation of different local characteristics (urban, semi-urban, and rural), and the locations are within 150 km from Mekelle, capital city of Tigray.

### Study Participants

The participants for the focus group discussions were mothers and fathers with young children under 2 years of age, with the number of participants ranging from 6 to 12 in each group. In-depth interviews were conducted with 15 mothers with small babies born in the previous 1 month, 11 community health workers (health extension workers (HEW)) and women development group (WDG), and 11 health workers (nurses and midwives) in health facilities. It was difficult to gather

**Table 1** Five of the Seven Zones of the Region Were Included in This Formative Research

| Zones      | Selected Districts                | Selected Health Facilities                          |
|------------|-----------------------------------|---|
| South      | Maichew, Endamehoni, Nikaah       | Maichew lemlem Karl hospital, Neksege health center |
| South east | Degua Temben, Alasa, Arebay       | Hagereselam primary hospital, Alasa health center   |
| Eastern    | Adigrat, Gantaafeshum, Kitagedeba | Adigrat hospital, Bizet health center               |
| Central    | Abi-adi, Guya                     | Abi-adi hospital, Guya health center                |
| Mekelle    | Mekelle, Serawat                  | Ayder referral hospital, Serawat health center      |

grandparents for FGDs, therefore 3 IDI and 1 FGD were conducted with grandmothers and 6 IDIs and 2 FGDs with grandfathers of young children under 2 years of age. These informants were identified with the help of responsible health directors for the area to give detailed information. Parents and grandparents with children less than 2 years of age were selected to be participants to avoid recall bias.

## Data Collection Method

FGD and IDI data collection guides were designed and developed by the research team. The main purposes of the guides were to obtain in-depth understanding about the care of small babies, the prevailing newborn care beliefs, practices, and norms in the community, and facilities in the study area.

One-week formative research training was provided to data collectors to harmonize perceptions between the research team members and data collectors, to share experiences of formative research, and to field test the formative research guides. These data collectors were functioning as key informant researchers. Nine was their number, and they all had a masters degree of public health (MPH). The research team was composed of professionals from pediatrics and child health, public health, and experts at regional health bureau.

For the FGDs a variety of participatory techniques (open-ended questions, pictorial representations of mothers giving KMC) were used to generate informal, relaxed, and open interaction among the participants and between the participants and the facilitator. The groups for the FGDs were homogeneous, and all interviews were conducted in the local language which is Tigrigna.

Overall 16 FGDs were held in five study areas. The duration of the group discussion was an hour to two hours on average. The IDIs were also conducted in a convenient place for the participant, and the average time that it took was 45 minutes to 1 hour.

The whole process of data collection was an iterative approach. All responses were recorded by digital recorders; supervisors who were KMC research members made debriefing/discussion with the key informant researchers and took notes of each debriefing session on a daily base. A debriefing guide with pre-stated goals was developed for the supervisors so as to have targeted information from the collected data and to have synchronization of the collected information. In this process a quick debrief of the day's event was done, discussing important and emerging ideas. By doing this a shared mental model is developed between the data collector and supervisor. Then there was discussion on the identified gaps and possible solutions for the gaps. Finally, based on the discussion, the reusability of the guide is assessed and refined to be used in the next interview.

## Data Analysis

The KMC team members and data collectors sat together for analysis workshop to discuss the major findings of the collected data. The recorded data were transcribed. Two of the key research informants coded themes, perspectives, and experiences using ATLAS.ti software. The transcribed data were analyzed using an inductive approach, and themes were identified, discussed, and agreed prior to the start of coding. The identified thematic areas were: care for small babies, birth identification, notification and birth weight measurement, perception of KMC by the community and health workers and KMC adopters. These areas were selected to establish the barriers and enablers of KMC implementation. Then, based on these, narratives were constructed around each major theme, and quotes were used to summarize perspectives.

## Trustworthiness

To ensure the trustworthiness and credibility of the findings of the study, several approaches were employed. The FGD and in-depth interview facilitators or interviewers had good knowledge on KMC and had previous experience in provision of KMC services. There was an ongoing supervision which included debriefing sessions throughout the data collection. An interim and a final analysis workshop were also conducted – the former to improve the process of data collection from the lessons learned, and the latter workshop to have an overview of the findings. With the findings, a validation and dissemination workshop was held. The workshop audiences were people from higher officials, districts health directors, and health workers from the study area, who gave their suggestions and comments on the findings.

## Result

### Characteristics of Participants

A total of 16 focus group discussions and 46 in-depth interviews were conducted with mothers, fathers, grandfathers, grandmothers, and health workers (Tables 2 and 3).

The themes identified through the inductive analysis approach were: community perception regarding preterm and small babies; care for preterm and small babies; birth identification, notification, and birth weight measurement at health facilities; community's and health workers' perception regarding KMC; and KMC adopters.

### Community's Perception Regarding Low-Birth-Weight and Preterm Newborns

Most stated that low-birth-weight babies are not healthy, and some of them mentioned infection as one of the reasons why babies are born LBW. Most also believe that the weight difference as compared to normal-birth-weight babies will continue, and they do not think they catch up at all.

Almost all FGD participants repeatedly mentioned that the perception of the community is that babies born at 8 months could not survive but babies born at 7 months could survive if special care is provided. Participants repeatedly mentioned that the community perceived that babies born at 7 months of GA are very alert, beautiful/handsome, active, but babies born at 8 months of GA are very weak, have difficulty in breastfeeding, not fully matured, and could not survive even if special care is provided.

My father gave me a gift when I delivered my daughter at 7th month of GA. He told me that "your daughter is a precious gift from God and called her as 'Shimbera pagumen'." I used to keep her warm traditionally. She grew up and survived. My perception regarding babies born at 8th month is he/she cannot survive but babies born at 7th month do survive. I also had a baby born at 8th month but he died after three days of delivery. (A grandmother reflects on what happened when she had a preterm baby 25 years back)

**Table 2** Description of Participants of the FGD

| Participants | No. of Groups | No. of Participants in a Group               | Age of the Participants                           | Education Level                       | No. of Children  |
|--------------|---------------|--|---|---------------------------------------|--|
| Grandmother  | 1             | Minimum no. of participants 6 and maximum 12 | Minimum age 17 years and maximum age 73 years old | Most illiterate highest level diploma | Minimum no. of children 1 and maximum number of children 8 |
| Grandfather  | 2             |  |   |                                       |  |
| Mother       | 10            |  |   |                                       |  |
| Father       | 3             |  |   |                                       |  |

**Table 3** Description of Participants of the IDI

|                     | Grandmothers                                  | Grandfathers | Mothers Who Adopted KMC | Mothers Who Did Not Adopt KMC | WDGs | Health Workers                        |        |          |
|---------------------|---|--------------|-------------------------|-------------------------------|------|---------------------------------------|--------|----------|
|                     |   |              |                         |                               |      | HEWs                                  | Nurses | Midwives |
| No. of Participants | 3   | 6            | 9                       | 6                             | 5    | 6                                     | 2      | 9        |
| Age                 | Minimum 17 and maximum 60                     |              |                         |                               |      | Work experience                       |        |          |
|                     |   |              |                         |                               |      | Minimum 7 months and maximum 14 years |        |          |
| No. of children     | Maximum 6 and half of the mothers had 1 child |              |                         |                               |      | Level of education                    |        |          |
|                     |   |              |                         |                               |      | Degree                                |        |          |

## Care Practice for Small Babies

Breastfeeding and keeping newborns warm were the most frequently mentioned care practices provided by parents and other family members to preterm or low-birth-weight babies.

### Breastfeeding

Participants were aware that newborns should be on exclusive breastfeeding for the first 6 months of life. They also knew that it should be initiated as soon as possible and that it should be given frequently. Although most participants knew that colostrum should be given, there were a few participants who believed that colostrum should be discarded. Meanwhile, additional feeding besides breast milk was mentioned by few participants if the baby is sick.

My baby was born very low in weight. But after frequent breastfeeding he improved well. (32-year-old mother IDI discussant)

### Keeping Newborn Warm

Keeping the baby warm was also frequently mentioned as an essential care practice for preterm and small babies. Participants frequently mentioned ways of keeping babies warm such as keeping the house warm, clothing in thick garments, cape, socks, and using traditional steam (local term: “tush”). A few participants also mentioned that a newborn should be held/cuddled by the mother to keep him/her warm. The reasons raised by the participants why babies should be kept warm was to prevent pneumonia described as cough, fast breathing, and grunting. In addition, participants also mentioned weight loss, failure to breastfeed, and mortality as consequences of failing to keep babies warm (hypothermia).

A 25-year-old mother in Neksege said: “The whole body of the newborn including head and foot should be covered with cloths”.

A 43-year-old father in Alasa also explained the effect of hypothermia as follows:

If babies who are born earlier than their normal duration of pregnancy (9 month) get cold, there is a high possibility that they might not grow well. The reason is that he/she did not get the heat from his/her mother until his/her 9th month of pregnancy. Therefore, the chance of survival will be low.

Community members reported that they have heard of heaters/incubators and know that it is used to keep preterm and small babies warm and they believe it is a preferable method. Some of the ways mentioned to move small babies from place to place were a box and a basket. Most, except some mothers in Mekelle, were not aware of KMC as a means of keeping small babies warm and that mothers can move around carrying the baby in KMC position.

A thirty-year-old Neonatal Intensive care Unit (NICU) nurse in Maichew hospital explained the community’s perception towards heaters as follows:

as to my observation and discussion with some mothers or family members, the community usually prefer heater to warm a preterm or LBW baby than using other means like KMC and this is due to lack of awareness and they are not mentally ready to practice it.

## Birth Identification, Notification, and Birth Weight Measurement

### Birth Identification and Notification

With reference to how a home birth is identified and how it is notified, most participants mentioned that birth notification is done by members of the women development groups (women knowledgeable about pregnancy and delivery) who then inform the health extension workers in their network. A 30-year-old woman FGD discussant in Guya (Kolla Temben district) stated,

We (the mothers) are all grouped in one to five ratio and the groups are organized under the supervision of the health extension workers. Since five of us are familiar with one another, we know every health-related issue of each member.

Another 28-year-old FGD discussant further explained, saying:

since the members are neighbors, it is easy for them to identify and know who is pregnant, who has given birth and which baby is born preterm or low-birth-weight.

Despite this, there was a complaint that HEWs do not undergo home visits at the expected time, which resulted in late identification of newborns. On other hand, HEWs mentioned work load and delayed notification of birth from women development groups about birth of a newborn as the main reasons for the delay.

### Birth Weight Measurement

Participants witnessed that weight is measured for all babies born at health facilities while the practice is not performed for newborns delivered at home. Meanwhile, lack of appropriate weighing scale was mentioned by HEWs for not weighing at home. HEWs rather mentioned that they would inform mothers who delivered at home to go to health facilities and get their babies weighed.

Weight measurement is routine activity of all health professionals who attend labor. The barriers for weight measurement at health facility could be; being so busy and forgetting, difficulty in using the measuring scale, if the baby is sick weight measurement could be postponed and if the baby born at home in these conditions weight may not be measured. (Nurse)

### Perception of KMC by the Community

Most participants were not aware of KMC practice. The interviewers in the study explained what KMC is verbally and using supporting KMC pictures. Then they asked the respondents what they feel about the practice regarding its compatibility, easiness to practice, and its advantages and disadvantages over the existing newborn care practices for preterm and low-birth-weight babies.

Direct skin-to-skin contact and keeping small babies in kangaroo position was considered unusual by most of the participants. In some of the participants there was a concern that it may predispose the infant to infections and they thought the warmth of the provider is not good for the baby. For these reasons they prefer to keep the baby clothed with garments and keep them separate. An FGD discussant mother from Adigudom described it as follows:

With the skin to skin contact the mothers' warmth and sweat is not good for the baby. It is good to cloth the baby with its own cloth when cuddling and put him/her in his/her own creep. I don't think this practice has a benefit.

Most participants stated the fact that it is neither their tradition (custom) nor socially acceptable to hold babies in this position, and this may make the mothers uncomfortable to practice it. Most participants were concerned that this practice may predispose the baby to harm, in case the mother falls down.

Participants repeatedly mentioned that holding an infant in the kangaroo position can interfere with the mother's routine activities as the mother is responsible for household works. This may not be acceptable by other members of the family. Some participants stated that the possibility that the baby will survive is guarded; for this reason mothers may not get enough support from the family members. There are cultural barriers to paternal participation in the care of low-birth-weight infants, and mothers are usually reluctant to allow fathers to participate. In addition, some fathers consider giving direct care to premature infants is the natural role of the mother. However, after discussion about the importance of KMC, most participants were open-minded to adopt and provide this care.

A grandmother in Alassa described what she saw as follows: "according to the picture it is like the infant is in his mother's womb. The skin-to-skin contact would make the baby feel like he/she is in his/her mother's womb."

A grandmother in Guya also stated: "this tiny infant who is at risk of getting cold can get heat from his mother."

Participants also mentioned some other potential benefits of KMC, such as the possibility of improving mother-child bonding, frequent breastfeeding, mother can go home early and give the care without compromising her responsibility at home. Some fathers were also positive that it can be practical under supervision of health professionals. FGD discussant mother in Guya said:

I have no objection on accepting it. The mother would be at home with her family. We have been referred to Mekelle because there is no heater in nearby health facilities. I think this practice (KMC) is a solution for this. I personally will adopt it.

This study found areas (Neksege and Alassa) where traditionally mothers use steam (local term: "tush"), and once the mother is out of the steam, while she is still warm, she holds the baby close to her body to keep the small baby warm.

The possibility of hearing about KMC from role models was mentioned by some participants as a good way to promote KMC. Women development groups, health extension workers, and community meetings are the three most frequently reported sources of information about newborn care for the majority of the participants from rural areas, and urban discussants and informants prefer the media as source of information.

### KMC Adopters' Perception

Mothers who adopted KMC stated that they were taught how to put the baby in skin-to-skin contact but not how to secure the baby. A 32-year-old FGD discussant from Meremeyti said: "I indeed have practiced the skin-to-skin contact so that my baby can get heat. But as to how to secure the baby is new for me." The mothers were also not comfortable on doing it at night due to fear of suffocating the baby. The other challenge mentioned was that as use of diaper is not culturally acceptable and economically feasible, putting the baby naked in skin-to-skin contact will be unhygienic and be demanding of frequent bathing. A grandmother informant in Bizet said: "the care seems helpful. However to practice it, both the mother and the baby have to bath many times in a day which is not feasible."

Mothers also said that they cannot do it at home given the obligations they have. They said it is impossible to do household activities holding the baby in kangaroo position. Furthermore, a few mothers suggested that husbands should be the ones to help with the practice. But most of the mothers and the community representatives interviewed stated that it is unlikely for husbands to give the care.

A woman with preterm and LBW baby in Adigrat Hospital explained saying, "How can husbands practice KMC? They are always in the field/ farm." She also said:

I am not sure if I will be able to do it at home, given that there is a lot of task for me. I do not expect my husband to help me in any way. It is unthinkable.

In the same way a woman with a preterm and LBW baby in Maichew stated, "Husbands are hardly at home. And after all how can a man care for a newborn baby?"

Similarly, a 50-year-old FGD participant father in Bizet said: "it is difficult to even sleep in the same position for an hour let alone sit holding a baby in this position."

Most mothers are not willing to let other family members provide KMC to their baby as well. A mother who was practicing KMC in Ayder hospital said: "It is ok for others to hold the baby the usual way. But No! I would not allow others to hold my baby this way."

Lack of counseling and advice by health workers on the need to do it at home was the other challenge mentioned by some mothers.

The fact that KMC adopters are convinced that KMC is helpful for their babies' growth and community health workers (WDGs and HEWs) are trusted and accepted by most of the community members is a favorable condition for the implementation and continuation of KMC. Some participants suggested that involving CHW will be important for the continuation of the care at home as they can play a great role in advising and following the mothers. The respondents also mentioned involving husbands through the whole process, awareness creation for the mothers and the community at large, and counseling on KMC during ANC visits as crucial factors to make the continuation at home possible.

### KMC Practice at Health Facilities

Fifteen IDIs were conducted among health workers (nurses, midwives, and HEWs). Lack of KMC rooms, NICU and equipment (oxygen, incubators, phototherapy, protocols), absence of KMC-friendly clothes, lack of support from family during mothers' stay in health facilities, low level of awareness, untrained health workers, initiation of formula feeding, and preference for heaters/incubators were the common challenges mentioned by health workers.

There are no KMC rooms and NICUs in most of the facilities. The health worker informants frequently mentioned shortage of staff and trained health workers and lack of equipment for neonatal care as a barrier to practice KMC. Health providers working at hospitals where there is NICU service reported that there is a tendency to initiate formula feeding if

the mother is not able to express breast milk early. Some health workers prefer warmers, and there were misconceptions by admitted mothers.

A mother from Kolla Temben stated:

I think the heater is better. In the first few days the baby is not able to suckle. Therefore, what is the need for her to stay with me? The heater is good for the baby.

Moreover, most health professionals are concerned that there are no KMC-friendly clothes for the practice and stated mothers are poorly prepared for birth. The level of awareness of KMC among health workers in the low-level health facilities (health centers and health posts) is low, and they appear to confuse KMC with the first skin-to-skin contact given right after delivery.

The other common challenge mentioned by some health workers where there is KMC practice in their facility is that attendants of admitted mothers are not allowed to be with the mother during her stay in the hospital, so she cannot get adequate support from the family members. Moreover, husbands are not allowed to be there for the sake of the privacy of the other mothers in the room. For this and due to obligations at home mothers do not want to stay at health facilities. A nurse in Bizet health center stated that “most mothers with small babies don’t want to go to a hospital to get KMC service, rather they prefer to go back home.”

The health workers suggested to use ANC follow-ups to promote KMC and educate mothers on birth preparedness. Postnatal follow-ups were also suggested to be good opportunities to sustain the continuity of KMC. There is also a structure where, as mothers are discharged, there is a trend of linking them to their local health extension workers who are responsible for providing postnatal care during their home visits. Involving WDGs in timely identification and notification of preterm and LBW babies was also suggested to be a good entry to initiate KMC.

## Discussion

The aim of this research was to identify the possible barriers and enablers for KMC implementation and continuation. At facility level, unavailability of material and human resources, low knowledge of KMC, and preference for incubators were among the challenges mentioned. The presence of antenatal and postnatal follow-ups and the practice of linking mothers with HEWs after discharge were the favorable conditions to implement KMC at health facilities and continuation at home. The three prominent barriers identified in the community were low level of awareness, cultural influences, and lack of support. On the other hand, mothers and community members’ understanding of keeping babies warm, the well-established network between mothers, WDGs, and HEWs were among the enablers in the community.

## Barriers and Enablers in Health Facilities

The current study found lack of infrastructure (KMC rooms and NICU) and equipment (KMC-friendly clothes, protocols/guidelines) for KMC practice, shortage of staff, and absence of trained health professionals to be the most frequently mentioned barriers by health workers. Most health workers in health centers and health posts confuse KMC with the first skin-to-skin contact given right after delivery. Similarly, a systematic review of 103 studies, of which 22 were from sub-Saharan countries, on barriers and enablers of KMC implementation showed increased workload/staff shortage and lack of clear guidelines/training to be among four of the top-ranked barriers to practice KMC for nurses.<sup>7</sup> A study including 12 countries from Africa and Asia on a multicountry analysis of health system bottle-necks stated that the shortage and the poor distribution of well-trained health workers to care for LBW babies and support the practice of KMC were mentioned as a bottle-neck in 9 of the 12 countries. Ten of the countries also reported on poor availability of basic supplies for KMC in health facilities, particularly those required to support the feeding of LBW babies, inadequate space for performance, and monitoring of KMC.<sup>13</sup>

In some of the health workers preference for incubators over KMC and the tendency of initiating newborns on formula feeding early were barriers in health facilities with NICU. Mothers who are not willing to stay in hospitals due to their obligation at home and lack of support were the other barriers mentioned that make KMC practice at health facilities difficult. In a study done in Iran on the domain of organizational barriers, necessity of a physician’s order for KMC was found to be the most important barrier in application of KMC.<sup>14</sup> Lack of continuous attendance of mothers in the ward,

mothers' fear of touching a premature infant, mothers' fear of ward equipment, and twin or triplet infants were the barriers identified to implementing KMC in health facilities.

A possible enabler identified in this study suggested by health workers was using opportunities like ANC and PNC follow-ups to introduce and promote KMC. The communities' positive attitude towards community health workers is another enabler for the implementation of KMC and making it sustainable. The trend of linking discharged mothers with health extension workers is another favorable condition identified. Similarly, a systematic review which included 103 publications stated that support from staff or community health workers (CHW) was the fourth-highest-ranked enabler in all the reviewed publications.<sup>7</sup>

## Barriers and Enablers in Mothers and the Community

In this study, lack of support from husbands and family members was the frequently mentioned challenge. Support from husbands seemed to be unlikely due to both cultural influence and the mothers not being convinced that men can be involved in the care of a newborn. This may be challenging as the mother is responsible for the rest of the family with household activities. Similarly, in the mentioned systematic review, lack of help with KMC practice or other obligations were among the common barriers.<sup>7,9</sup> In a study done in Iran, mother-related barriers were the main barriers in the implementation of KMC as there was lack of continuous attendance of mothers in the ward.<sup>14</sup> Another barrier was the mothers' fear of touching their infants.<sup>7,14</sup> According to systematic review, especially in low- and middle-income countries pain and fatigue was one of the highest barriers to practice KMC.<sup>7</sup>

Low awareness of KMC, cultural belief that a baby should be carried on the back, and misconceptions including the belief that the most effective care is in an incubator were challenges identified in this study and other studies as well.<sup>9,13</sup> Home deliveries and late notification of those babies delivered at home and misconception about preterm babies' survival were the other challenges in the community that this study identified. In another systematic review, the barriers to KMC adoption by caregivers included adherence to traditional newborn practices, stigma surrounding having a preterm infant, and gender roles regarding childcare.<sup>12</sup>

Additionally, the current study found that the mothers were not trained and counseled adequately on the practice and continuation of KMC at home. This is because most of the health facilities did not give KMC service and because of shortage of trained health workers on KMC. The above cited reviews show that lack of education and community mobilization to increase knowledge about the benefits of KMC is another common barrier for the implementation of KMC.<sup>9,13</sup>

Despite these challenges, the community in general has understood that it is mandatory to keep newborns warm, and the fact that there were areas where they keep the baby in skin-to-skin contact to keep the baby warm will be some of the good grounds to create awareness.

## Study Limitation

The methods of interview used in this study were both IDIs and FGDs; the number of IDIs was significant as compared to the FGDs. Despite the known advantages of IDIs this may lead to suppression of the view of the majority. The participants were selected by the directors of the districts which may make it biased, and the included study areas are those within 150 km from the capital city which were most accessible for transport; this may not be representative of those in remote areas where there could be a problem of transportation.

## Conclusion

This study identified the possible barriers and enablers for the practice of KMC from mothers', community members', and health professionals' point of view in the specified study area. Knowing the barriers will help come up with solutions or identify interventions and make the implementation of effective KMC possible. The study showed that there is a need to work widely on training health workers and on mass awareness creation of the community. There is also a need to utilize or to make the existing health system functional/involving WDGs and HEWs especially in the identification of births and follow-up of neonates post-discharge from health facilities.

## Abbreviations

ANC, antenatal care; CHW, community health workers; ERC, ethical review committee; FGD, focus group discussion; HEW, health extension workers; IDI, in-depth interview; KMC, kangaroo mother care; LBW, low birth weight; NICU, neonatal intensive care unit; PNC, postnatal care; WDG, women development group; WHO, World Health Organization.

## Data Sharing Statement

Data will be available upon official request. Please contact MYH.

## Ethics Approval and Consent to Participate

Ethical approval to conduct the assessment was obtained from the institutional review board of Mekelle University and by World Health Organization (WHO) Ethical Review Committee ERC 0740/2016. Support letter was obtained and written to each district health offices from the Tigray regional health bureau. A verbal consent which was recorded on audio was taken from every participant. The study complies with the Declaration of Helsinki.

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## Disclosure

The authors declare that they have no conflicts of interest in relation to this work.

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