ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF NURSING AND MIDWIFERY

DEPARTMENT OF NURSING

CHALLENGES FACED BY MOTHERS PRACTICING KANGAROO MOTHER CARE IN NEONATAL INTENSIVE CARE UNIT IN PUBLIC HOSPITALS, ADDIS ABABA, ETHIOPIA, 2020.

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A THESIS TO SUBMITTED TO POST GRADUETE STUDIES ADDIS ABABA UNIVERSTY COLLEGE OF HEALTH SCIENCE, SCHOOL OF NURSING AND MIDWIFERY, THE DEPARTMENT OF NURSING, FOR PARTIAL FULFILLMENT OF THE REQUIREMENTS OF MASTER'S DEGREE IN NEONATAL NURSING.

JUNE 2020.

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ABBREVIATION

CPAP	Continuous positive Air way Pressure
HCW	Health care Worker
KMC	Kangaroo Mother Care
LBW	Low Birth Weight
MCU	Minimal Care Unit
NICU	Neonatal Intensive Care Unit
SSC	Skin-to-Skin Contact
SGA	Small for Gestational Age
VLBW	Very Low Birth Weight
WHO	World Health Organization

SUMMARY

Background: Kangaroo Mother Care (KMC)- is found to improve the survival of preterm and low birth babies. Mothers who practice are more sensitive to changes in their babies. In spite of these benefits, mothers face barriers to practice KMC; some of these are inadequacy of resources, lack of support from staff and family and, low awareness about KMC.

Objective: To assess challenges faced by mothers practicing Kangaroo mother care in Neonatal intensive care unit in public hospitals in Addis Ababa, Ethiopia 2020

Methods: The study is institutional based cross sectional quantitative study. The study area was selected by systematic random sampling method. Five public hospitals that provide NICU service were including in the study. The desired sample size for the study was 237 calculated using a single population proportion formula. A structured questionnaire was administered for data collection. Bivariate and multivariate analysis was used for analysis. Strength of association was measured using odds ratio, and 95% confidence intervals. Statistical significance is declared at P value <0.05.

Results: A total of 237 mothers from 5 public hospitals with their preterm infants were enrolled in the study. Mother who delivered by C/S (elective included) were 4.4 times more likely to be challenged to practice KMC Mothers who had back pain were 3.10 times ([AOR= 3.10, 95% CI: 0.94, 4.22]), abdominal pain 8.06 times ([AOR= 8.062, 95% CI: 1.352, 10.22]), head ache 2.228 times ([AOR= 2.228, 95%CI: 0.192, 9.813]) and those who reported discomfort of bed/chair were 0.4 times ([AOR= 0.446, 95%CI: 0.96, 2.075]) more likely to be challenged to practice respectively. Mothers who stated as they have shortage of clothes to change for themselves and for their preterm infants were 3.96 times more likely to be challenged ([AOR= 3.96, 95%CI: 1.84, 8.58]). Likewise mothers who reported that the hospital has no area to wash their clothes were 2.49 more likely to be challenged ([AOR= 2.49, 95% CI: 0.75, 8.22])

Conclusion: The study revealed that mothers practicing KMC face challenges related to the mode of delivery and post natal condition of the mother. Hospital infrastructure was also one of the challenges identified by the research, hence for mothers to practice KMC without a challenge they should be supported and encouraged.

1. INTRODUCTION

1.1 Background

Kangaroo Mother Care (KMC) is a skin-to-skin contact between a mother and baby in this manner encouraging exclusive breastfeeding, providing warmth, and enabling timely discharge from hospital. It has been planned as an alternative to incubator or conventional care for Low birth weight (LBW) infants. KMC, were found to change the survival of preterm or LBW babies besides it is established as a method for caring and improving the outcome of preterm babies in scarce resource area(1).

In 1978 Dr Edgar Rey Sanabria introduced KMC in Bogotá, Colombia as another option for incubators to LBW infants. Accordingly, KMC is maintaining the infant's temperature and other vital sign parameters through Skin to Skin Contact (SSC), providing the benefits of breastfeeding and improved outcome. These thoughts to be advantageous for all newborns but may be particularly beneficial for preterm infants (2). WHO provides guidance on the components of KMC, guidance on the operationalization and clinical implementation of KMC are required. According to WHO, Early, continuous and prolonged skin-to-skin contact between the mother and the baby are the key features of kangaroo mother care including: early discharge of small babies, exclusive breastfeeding, the need for follow up and support for mothers. And it is effective method that avoids the agitation routinely experienced in a hectic unit with preterm infants (3).

KMC has lots of advantages for, the preterm and low birth weight infants: it normalizes temperature, respiratory rate and heart rate. It has reduction of hypoglycemia, infection, breathing problems, hospital readmissions, physiologic and behavioral pain responses. Furthermore, it has important impact on weight gain, strengthens the infant's immune system and enhances mother-infant bonding. Furthermore, it has positive effects on cognitive development throughout the child's life, earlier discharge and less nosocomial infection. For mothers, double rates of successful breastfeeding, increases milk volume feelings of confidence, competence, linked to reductions in stress and satisfaction regarding baby care (4, 5).

KMC is recognized as an intervention with significant health systems barriers to scale–up with leadership and governance, health financing, health workforce, health service delivery, health information systems, and community ownership and partnership, KMC has main concern on intervention criteria such as mortality benefit and equity based on Nutrition Research Initiative methodology identification (6). Benefits to both mothers and babies can be obtained in residences where technology is available however in low resource setting KMC potentially improve the health and survival of LBW newborns(7).

KMC is a simple, low cost method began as a way to save infants warm and provide optimal nutrition, promoting exclusive breast feeding and facilitates early discharge. KMC was proposed as an alternative conventional neonatal care for low birth infants. It is an anniversary available and biologically sound method of care for all premature babies. Strictly upright position on mother's chest (kangaroo position) and covered by a soft blanket. The duration of skin to skin contact usually lasts one to three hours. Compared to infants who are not offered KMC those who receive it were found to have improved growth and development, higher daily weight gain (8). Kangaroo nutrition is the delivery of nutrition to infants as soon as oral feeding is possible. It

is based on exclusive breastfeeding by direct sucking, whenever possible. Goal is to provide exclusive or nearly exclusive breastfeeding (9).According to the study of Bogotá, Colombia, assessing the long-term clinical effects of KMC found that KMC improved successful breastfeeding rates and infections. In 2003 did not find any mortality benefit with KMC but a latest systematic review at 2010 showed that KMC substantially reduces neonatal mortality and morbidity especially due to infections, among preterm babies in hospital with a weight of ≤2000 g (10).

1.2 Statement of the problem

Yearly 15 million neonates are born preterm at a high risk of mortality, from that during their first four weeks of life 4 million newborns die each year. South Asia and sub-Saharan Africa account for almost two-thirds of the world's preterm babies. Infants born before term or at low birth weight (LBW) are at higher risk of neonatal mortality and morbidity, inhibited growth and development, and chronic disease. (11).

Worldwide 44% of under–five deaths occur during the neonatal period, and the proportion of under–five deaths that occur due to neonatal causes continues to rise. Low birth weight (defined as birth weight <2500 g) is commonly used as a surrogate measure of preterm birth. Preterm birth (before 37 weeks gestation) accounts for 35% of neonatal deaths (6). Nonetheless preterm and low birth weight infants who survive the neonatal period are more likely to experience neonatal and childhood morbidities.

In developing countries, the current neonatal mortality counts approximately 40% of all deaths for children below five years of age. Birth weight is one of the significant determinants of newborn survival. In developing countries, LBW infants are approximately 13 times more likely to die than normal birth weight counterparts.

It is known that caring for preterm and LBW babies has a significant medical cost. (12). With the increasing advancement in biomedical technology, options like incubators can help improve outcomes in LBW and premature as wells high-risk infants; however, it is very hard to get such equipment widely available in low- and middle-income countries where resources are very limited, and these countries are where 99% of all neonatal deaths occur.

A recent review of available interventions recommend that breastfeeding, hygiene, antenatal corticosteroids to prevent preterm birth complications, case management of suspected infections, and hospital care of small babies that includes KMC are the most effective interventions for improving survival of LBW infants (13).

A significant proportion of deaths among preterm and low birth weight infants are preventable. There is evidence that kangaroo mother care, when compared to predictable neonatal care in resource–limited settings, significantly reduces the risk of mortality in infants born in facilities who are clinically stable and weighing less than 2000g (14).

In addition, LBW infants are at high risk of impaired growth and development. Effective and low-cost alternative methods of neonatal care are needed. KMC can also reduce the risk of hypothermia, severe illness, nosocomial infection, and length of hospital stay, and improves growth, breastfeeding, and maternal– infant attachment which have a positive impact to growth and development of these babies. (15).

Mothers who practice KMC are more sensitive to changes in their babies (16), they show less maternal stress (17) and are likely to have a family that is more cohesive. Thus, confidence is built in meeting their babies' requirements (18). Breastfeeding and adequate follow-up after discharge have also been well-known in mothers who have practiced KMC. In spite of these benefits, mothers face barriers to practice KMC. Some of these barriers can be scarcity of resources, negative impressions of staff attitudes, lack of assistance with KMC practice or other obligations and low mindfulness of KMC (19).

Kangaroo mother care in Ethiopia was started as a one way of reducing LBW mortality in black lion hospital. KMC is one of the interventions proven to be a safe alternative to conventional neonatal care in resource -limited settings (20).

A study done in Ethiopia showed mortality for LBW infants to be 32.8%. In the same study hypothermia was the associated cause of death for the majority. Here is where KMC can help in reducing mortality which is mainly due to hypothermia, as KMC uses skin to skin contact which is proven to be effective in preventing hypothermia.

Therefore the aim of this study is to assess challenges faced by mothers practicing Kangaroo mother care in different public hospital who have a NICU service in Addis Ababa.

1.3. Significance of the study

KMC is considered as a low cost and most effective intervention in caring for preterm and LBW babies, which is mostly practiced by mothers in their early postnatal period. The fact that the practice is started in the very first days of postnatal period makes it very challenging for the mother to practice as those days are very painful. Still a mother is a mother and she gives whatever she can to help safe her baby. Thus if thought properly and given the right support a mother understands the use that KMC had for her baby's wellbeing.

Despite the impact that KMC has the challenges that the mothers face is not studied well. The challenges can be of different reasons, which are not clearly understood yet. Therefore this study aims to assess these challenges and how they impact the practice. If the challenges are well understood, possible solutions can be recommended for a better practice and outcome. It will also impact program officers to start to think that practicing KMC is not as an easy thing to practice. Improvement areas for a quality and scaled up KMC practice is also another suggestion that can come out of the study. For health professionals the study will help them to better understand the challenges faced by mothers during practicing KMC. This study has also important impact to Neonatal Intensive Care Unit by identifying these challenges which may not have been considered before and recommending possible improvements in KMC room and the practice. Researchers as base for further study and policy makers to see where the gap is and support to take measure in improvement of Kangaroo mother care.

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2. LITERATURE REVIEW

World Health Organization (WHO) recommends every baby immediately after delivery stay warm in the first two hours of life, and for sick newborns during transport for referral. This recommendation is very important in particular for low birth weight (LBW) infants, because they require skin-to-skin (SSC) for a longer period of time, depending on their weight and condition.(3) KMC is "the early, prolonged, and continuous skin-to- skin contact between the mothers (or substitute) and her low birth weight infant, both in hospital and after early discharge, until at least the 40th week of postnatal gestation age, with ideally exclusive breastfeeding and proper follow-up". Ideally, small babies should stay in the skin-to-skin position all day and night to maintain a stable temperature (14).

2.1. Mothers practicing Kangaroo mother care in Neonatal intensive care unit

Practice of KMC among mothers in NICU

Mothers who practice KMC are more sensitive to any changes in their babies which have made them to have a family that is more cohesive. These mothers have also showed less maternal stress, thus confidence is built in meeting their babies' needs. Breastfeeding and adequate follow-up after discharge have also been noted. In spite of these benefits, mothers face barriers to practice KMC. Some of the barriers mothers face to practice KMC are scarcity of resources, negative impressions of staff attitudes, lack of help with KMC practice or other obligations and low awareness of KMC (21).

A study in Bangladesh showed that KMC practice among the community was quickly and widely adopted by mothers after delivery. Although the study hasn't documented the continued practice of KMC between mothers and babies once they return to their communities due to lack

of active follow up (22).Bangladesh is looking at home initiation of KMC for all babies showed that KMC practice was more common among mothers who were taught and counseled on KMC compared to those who were not, but the effect it has on mortality was not reported (23).

According to a study done in Bahirdar, Ethiopia, the majority (60.6%) of the respondents had a good practice of KMC. In Dangla health center which was one of the study sites, a total of 414 postnatal mothers were interviewed and the 194 (46.9%) of them started their first visit at 3–6 month of gestation with an average of 3.48 visits (24).

The complete KMC, including early discharge, skin-to-skin contact, and good quality nutrition based primarily on breastfeeding, has the largest potential for benefit in this environment. KMC that are used an alternative to practices in a minimal care unit (MCU) (25). Many studies have reported the benefits of KMC over incubator care, which is expensive for low resource settings when compared to KMC. Support from evidences explain the effectiveness and safety of KMC in stable, preterm infants. In LBW infants weighing 2000gm or less, who are unable to regulate their temperature, KMC is at least as safe and effective as incubator care (26).

After discharge from Health facilities, additional home visits are made for babies who are born preterm and with low birth weight and were being treated with KMC. The workers support exclusive breastfeeding by teaching the mother about proper positioning and attachment for initiating and maintaining breastfeeding, and diagnosis and counseling in case of problems with breastfeeding. They also support in early identification of illnesses in newborn babies and provision of appropriate care and referral, and support the family in healthy practice (27).

2.2. Challenges faced by Mothers practicing Kangaroo mother care in Neonatal intensive care unit

2.2.1 Maternal and family related factor

Education on importance of kangaroo mother care method should be given to all mothers irrespective of whether they have pre-term or low birth weight babies throughout the postnatal period. Some mothers fail to practice the method because they are not aware of the benefits of the practice.

Moreover, health care workers should also be encouraged to remind the mothers throughout the perinatal period, that is, ante-natal, intra-natal and post-natal period. Once this is done, mothers can be prepared psychologically for KMC in case they give birth to premature babies or low-birth weight babies. For home deliveries, such knowledge can enhance KMC practice before mothers influence near health facilities. Basic knowledge that should be delivered about KMC must include; that KMC stabilizes newborn's temperatures, improves breathing and promotes mother–child bonding encourages the practice (28).

Many researches has been conducted concerning factors affecting KMC but they mainly emphasized on general factors, awareness and perceptions of mothers, staff and family members towards KMC, thus creating a knowledge gap of challenges facing mothers who practice kangaroo care method practice in different hospitals having KMC units especially in resource limited settings is very important (29).

In a qualitative study done in Dares Salaam Mwananyamala referral hospital, all mothers claimed to become fatigued with the method. One of the mothers stated that;

"…..we get tired of putting our infants in this position, its better if we are discharged home so that we can get assistance from other family members and we can rest too instead of handling them by ourselves…….by the way our infants do not increase in weight here every day. They just remain as yesterday or decrease"

Similarly, in the same study another respondent revealed that:

"…..Just imagine if you were myself then you sit in one place for a long time. You could get tired and stand up or change position. You cannot sleep on one side for the whole night without changing positions. That is why sometimes we put our babies on the bed so that they can rest and resume with kangaroo method again…."

This study showed that there was low awareness and information among mothers who practice KMC. Many women were not aware of this method which has made it hard for them to practice KMC effectively. The major challenges that were observed in their study to hinder KMC include fatigue of mothers, lack of cooperation from health care workers and environment of the wards. Mothers should be educated on the importance of kangaroo mother care right from antenatal period since both mothers and their babies benefit from the practice. Once mothers get to know the benefits of KMC and outweigh them with fatigue, they will tolerate (16).

Mothers who practice Kangaroo method of care needs assistants because they alone cannot hold a baby in kangaroo position for 24 hours. Fatigue especially after delivery can affect practice of kangaroo mother care. It is better for kangaroo units or wards to be independent so that space can be large to accommodate at least one relative of the mother to provide assistance. (30)

2.2.2 Institutional factors

Support from the health care workers is very crucial for the mothers to practice KMC effectively. Thus, health care workers should be reminded to encourage mothers to practice KMC. This can be reinforced with having the necessary supportive infrastructure like adjustable beds, pillows for cushioning and support from relatives. Hospital administrations should also rearrange KMC wards so as to make them comfortable for practicing the method for mothers with pre-term and low birth-weight babies including purchasing necessary equipment for the KMC wards (31).

In Nigeria, it was estimated that KMC would save over 19,000 lives by the year 2015 assuming if all preterm neonates were to be reached. For this to succeed, primarily the health workers have to start implementing KMC in the health facility where they practice and then aim to scale it up to involve the grass roots. According to the reports, one of the reasons attributed to poor expansion of KMC practice on a large scale in most low- and middle-income countries is because in these countries, KMC implementation started at a teaching or other tertiary hospital without expanding to district hospitals and at the community level. From this report provision of a private comfortable environment and having written protocols were identified as one of the supporting factors that promote KMC practice (33).

From the literatures above KMC is described as very efficient and cost effective interventions save the lives of preterm and LBW infants particularly in low resource areas. Mostly the mother and probably her family members are the ones who can provide this live saving method. Especially the mother when she is being part of the clinical care in practicing KMC, faces different challenges, other studies mention factors related to maternal and family, and

instructional infrastructure. The current study based had also tried to assess these challenges and tries to explain what they are and how they affect the mother while the practice.

CONCEPTUAL FRAMEWORK

A Mother who is practicing KMC in the hospital faces different challenges from various perspectives. Having the challenges as a dependent variable; socio demographic, maternal knowledge and illness, family related, and institutional factors are considered as dependent variables. The figure below shows the interactions each can have on the dependent variable. Socio-demographic related the research tried to see if any of those socio demographic variables can affect the practice of KMC. Knowledge of the mother is also seen an important factor, the study tried to see if being knowledgeable or not can contribute to the challenges the mother faces. Maternal illness related to the mode of delivery and post natal period is also considered as an important variable which can challenge the mother during the practice, since KMC needs the mother to be in good condition for the practice. Institutional factors in regards to the KMC rooms, availability and functionality of basic infrastructure are another area to be assed to see if it has any association with the challenges the mother will face during KMC practice.


Socio-demographic factors
Maternal age
Educational level
Maternal status
Place of residence
Family related factors
Support from family members
Cultural acceptance
Challenges on Kangaroo mother care practice
Institutional factors
Separate place or room
Availability and functionality of
Knowledge of mother and maternal factor
Source of information about KMC
Maternal illness
Mode of delivery
Fatigue of mother
Discomfort to keep baby

Figure 1 Conceptual framework of challenges on KMC in public hospitals

(Source of literature reviews (16, 28, 31, and 32))

3. OBJECTIVES

3.1. General objective

- To assess challenges faced by mothers practicing kangaroo mother care in Neonatal intensive care unit in public hospitals Addis Ababa, Ethiopia 2020

3.2. Specific objectives

- To determine kangaroo mother care practice among mothers in neonatal intensive care unit in public hospitals, Addis Ababa, Ethiopia, 2020.
- To identify challenges faced by mothers in practicing kangaroo mother care in neonatal intensive care unit in public hospitals, Addis Ababa, Ethiopia, 2020.

4. METHODS AND MATERIALS

4.1. Study Area

The study was conducted in public hospitals in Addis Ababa, which are providing a Neonatal Intensive Care Unit (NICU) service.

Addis Ababa is the capital city of Ethiopia and seat of African Union and the United Nations World Economic Commission for Africa. It covers an area of 527 square kilometers and has 10 sub cities. Based on 2018 G.C. Census conducted by the Central Statistical Agency of Ethiopia (CSA). Addis Ababa city has a total population of 3,384,569. The city has 14 government hospitals among this only 10 hospitals have Neonatal Intensive Care Unit (NICU). These are Tikur Anbesa, Zweditu Memorial, Yekatiti 12, Gandi Memorial, Minellik ll, Tirunesh bejing, Alert,Ras Desta, St Peter and St. Paul's hospital. The study will be conducted in five Hospitals. These are Tikur Anbesa specialized hospital, St. Paul's Millennium Medical College, Gandhi Memorial hospital, Zewditu Memorial Hospital and Alert Hospital which were selected by simple random sampling technique . All 10 hospitals 688 neonate was admitted to NICU for the five hospital in one month which was obtained from the log book record to know the flow of the neonate to these hospitals; among which 150 were found in Tikur Anbesa , 102 in Gandhi Memorial , 140 in St.Paul's Millennium Medical college,80 in Zewditu Memorial Hospital and 80 in Alert Hospital.

Tikur Anbesa hospital was established in 1966 and located in Lideta Sub City. Formerly it was called Princess Mekonnen for memory Harar, but in 1975 it is named as Tikur Anbesa hospital. It is the largest referral hospital in the nation at a tertiary level and its placement covers an area of 4500 meter square. According to human resource statistics of the hospital, it is currently under Addis Ababa University (AAU) as part of the center of teaching hospital. It has 543 beds and around 2000 patients admitted per month on average. Tikur Anbesa hospital has 15 incubators and 10 KMC bed, a total of 28 nurses are working in its NICU.

Gandhi Memorial Hospital is a government hospital in central Addis Ababa kirkos kifle ketema. It was established by Mahatma Gandhi in 1948, and delivers primary care services for 58,000 women and new-born babies annually. Gandhi Memorial Hospital has 14 incubators and 4 beds in KMC room. A total of 27 nurses are working in its NICU of which 13 of them are trained for KMC. By the year of 2018/19 there were 10300 live births and 1020 of them were neonates who weighed less than 2500 grams. Among those who were born in the hospital 613 of them were admitted to NICU. (34)

St. Paul's Millennium Medical College, established through a decree of the council of ministers in 2010, although the medical school opened in 2007 and the hospital was established in 1968 by the late emperor Haile Selassie. And located in Gulele sub city. It is governed by a board under the federal ministry of health. The college initiated Ethiopia's first integrated and hybrid problem based curriculum for its undergraduate medical education and it currently expanding to postgraduate program and diversifying its undergraduate program. The college has more than 2800 clinical, academic and administrative and support staffs. While the inpatient capacity is more than 700 beds, the college sees an average of 1200 emergency and outpatient clients daily. St. Paul's Millennium Medical College has 20 incubators and 08 KMC bed, a total of 38 nurses are working in it is NICU

ALERT is a medical facility on the edge of Addis Ababa, founded in 1970, specializing in leprosy research. There is currently a 240-bed teaching hospital, which includes dermatology, ophthalmology, and surgery departments, also an orthopedic workshop, and a rehabilitation program. (35) Alert Hospital has 5 incubators and 04 KMC bed, a total of 12 nurses are working in it is NICU

Zewditu Hospital is a hospital in central Addis Ababa, Ethiopia. It was built, owned and operated by the Seventh-day Adventist Church, but was nationalized during the Derg regime in about 1976. The hospital is named after Empress Zauditu, the cousin and predecessor on the throne of Emperor Haile Selassie. Today the Zewditu Hospital is operated by the Ministry of Health. In the treatment of ART patients and currently treats

over 6,000 each month. Zewditu became the largest HIV clinic in Ethiopia, with 14,000 patients in its care. (36) Zewditu Hospital has 10 incubators and 06 KMC bed, a total number of nurses in NICU 20.

4.2. Study Design and Period

An institutional based cross-sectional study design was conducted from March to April, 2020.

4.3. Source of Population

All mothers who had preterm and small for gestational age (SGA) babies admitted in the NICU under the weight of less than 2500gm and are practicing KMC either intermittently or continuously.

4.4. Study Population

All mothers who have preterm and small for gestational age (SGA) babies admitted in the NICU under the weight of less than 2500gm and are practicing KMC either intermittently or continuously in the selected public hospitals during the data collection period

4.5. Eligibility Criteria

4.5.1. Inclusion Criteria:

- Mothers with preterm and small for gestational age (SGA) babies hospitalized and are practicing KMC at least for 48hrs in NICU of public hospitals will be included in the study.
- For intermittent KMC, Mothers with preterm and small for gestational age (SGA) babies hospitalized and were practicing KMC at least for 1h in and above in the NICU of public hospitals will be included in the study.

4.5.2. Exclusion Criteria:

- Mothers who will have critical preterm and SGA babies in NICU.

4.6. Sample Size Determination and Sampling Technique

The sample size was determined using single population proportion formula by considering confidence level (95%), with 5% marginal error, and a none response rate of 10%. Since there is no study conducted in Ethiopia which assesses the challenges faced by mothers practicing kangaroo mother care 50% assumption was taken to calculate the prevalence. By adding 10% non-response rate, the final sample size will be 422.

Where $n = (Z_{\alpha/2})^2 p (1 - p)/d^2$

n = sample size

A confidence interval of 95% is assumed ($Z_{\alpha/2= = 1.96)}$

p =expected prevalence = 50%

q = (1-p)

d = Desired precision = 5%

Non-response rate = 10%

Thus, $n = 1.962 \times 0.5 \times 0.5$

$=384$

n/1 +n/N

384

1+384/492

=215

Adding a 10 % non-response rate give the required minimum sample size (n) 237.

Five hospitals are selected randomly out of 10 governmental hospitals having NICU Proportional allocation was done. The study subject from each hospital is selected using systematic random sampling method where everyone was included in the study. Participants will be selected based on proportionate sampling from each health institution used the formula illustrated below.

4.7. Study Variables

4.7.1. Dependent Variable

- Challenges described by mothers practicing KMC

4.7.2. Independent Variables

- Socio demographic factor
    - maternal age
    - education level,
    - marital status,
    - employment
    - place of residence
- Maternal Factors
    - Maternal illness
    - Fatigue of mothers
    - Mode of delivery
    - Discomfort to keep the baby in position
- Institutional factor
    - Separate area/room
    - Overcrowding
    - Availability and functionally of infrastructure
- Health care worker factor
    - lack of support from HCW
    - Staff & student's interferences
- Knowledge of mother
    - Low awareness about KMC

    - Source of information about KMC
    - Given instructions about the practice
- Family related factor
    - Support from family members
    - Cultural acceptance

4.8. Operational Definition

Preterm - A baby born alive before 37 weeks of gestation.

- **Extremely preterm** – A baby born alive less than 28 weeks of gestation.
- **Very preterm** - A baby born alive less between 28 to 32 weeks of gestation.
- **Late preterm** - A baby born alive between 32 to 36 weeks of gestation.

Small for Gestational age (SGA) –is a term used to describe a baby who is smaller than the usual amount for the number of weeks of pregnancy**.**

Kangaroo mother care (KMC) - consists of early, continuous and prolonged skin-to-skin contact between the caregiver and the baby, exclusive breastfeeding or breast milk, and context-appropriate discharge and follow-up provided to the baby and his or her family.

Intermittent- Mother who practice KMC two to three times in a day but not include the night.

Continuous - The mother who practice KMC continuously without interruption

Challenge of KMC

The dependent variable is challenge while practicing KMC. Challenges described by mothers will be scored and a mean score of 5 will be considered as a cut off. Thus:-

- **Challenged: -** Mothers will be categorized as challenged if their mean score to the challenge questions is more than 5.
- **Not challenged: -** Mothers will be categorized as not challenged if their mean score to the challenge questions is less than 5.

Mothers who have their babies admitted in the NICU face different challenges that hinder KMC practice these are:

- Socio-demographic factors
- Maternal factors
- Family related factors
- Institutional factor
- Health care provider factor
- Maternal knowledge factor

4.9. Data collection Instrument

The questionnaire is adapted from other studies with careful modification. The questionnaire prepared by English then translated to Amharic version and again re-translated back to English to check for its consistency. The question is included five parts.

Part 1.Socio demographic Characteristics-7

Part ll. Specific to the last pregnancy labor and delivery -14

Part- III Knowledge of mother's about kangaroo mother care-5

Part IV: Practice of kangaroo mother care-9

Part V: challenges on Kangaroo mother care practice-13

4.10. Data Collection Procedure

Two BSc nurses were recruited as data collectors and one BSc nurse was recruited as supervisor. A data collector was responsible to conduct the interview in Amharic with the mother of a neonate. In order to decrease bias the data collectors will collect the data from other hospital

which is different from their working area. They will also record the result in a consistent manner and finally will submit the result to the investigator as scheduled.

4.11. Data Quality Assurance

All data collectors and the supervisor was oriented and trained on how to interview and record the data and was assigned to each hospital. In order to assess appropriateness of wording, clarity of the questions and respondent reaction to the questions and interviewer it was pre-tested on 5% of the calculated sample size at Menelik II Referral Hospital. Those who will not be the actual study participants and adjustment were made based on the results of the pre-test. For mothers who will not be available during data collection period; repeated trial will be attempted to get them. During the data collection time close supervision and monitoring was carried out by supervisor and the principal investigator to insure the quality of the data. Finally the collected data was checked by the supervisor and principal investigator for its completeness.

4.12. Data Processing and Analysis

The collected data was checked manually for completeness and consistencies, and then it was coded and entered to SPSS version 25 for analysis. Descriptive statistics was used to summarize socio demographic data. To identify associated factors, binary logistic regression analysis was carried out at two levels, first bivariate logistic regression was performed to each independent variable with the outcome variable and those variables with a p value < 0.05 was included in the final model (multivariate analysis). Strength of association was measured using odds ratio, and 95% confidence intervals. Statistical significance was declared at P value <0.05.

4.13. Ethical Consideration

Ethical clearance was obtained from Addis Ababa University, department of nursing and midwifery research committee. Each study participant was adequately informed about the objective of the study and anticipates benefit and risk of the study by their data collector. Verbal consent was obtained from study participants for protecting autonomy and ensuring confidentiality. Respondents was also told the right not to respond to the questions if they do not want to respond or to terminate the interview at any time.

4.14. Dissemination and Utilization of Results

Result of the study will be submitted and presented to department of Nursing and Midwifery, College of Health Sciences, Addis Ababa University. The study result will also be submitted to the selected hospitals. Effort will be made to present the result in a local or international workshops, conferences and meetings. For the publication purpose, the abstract of this thesis will be submitted to national or international peer reviewed publishers.

5. RESULT

A total of 237 mothers from 5 public hospitals with their preterm infants with an admission age of >48hrs were included in the study. The mean age of the mothers was 29yrs (SD+4.46). Majority of the infants 132(55.7%) were male with the remaining 105(44.3%) being females.

Socio-demographic characteristics

They were all enrolled from the NICU's of the selected public hospitals. Urban residency was higher (89.9%) than the rural (10.1%). Of all respondents 105(35.4%) were between the age 25-29. Regarding the marital status, 228(96.2%) of the women were married. As to educational background, 112 (47.3%) had attended up to secondary level education. Occupation wise, 145 (61.2%) were house wives. The house holds monthly income for 81 of them ranges between 2000 - 4500birr which gives a percentage of 34.2. (Table 1)

Table 1 Socio-demographic characteristics (n=237)

Variable	**Frequency (n=237)**	**Percent %**

Maternal age		
15-19	4	1.7
20-24	39	16.5
25-29	83	35.0
30-34	86	36.3
>=35	25	10.5
Marital status		
Married	228	96.2
Single	7	3.0
Widowed	2	.8
Place of residence		
Urban	213	89.9
Rural	24	10.1
Educational level		
Illiterate	15	6.3
Read and write	24	10.1
Primary	40	16.9
Secondary	112	47.3
Higher education	46	19.4
Occupation		
Student	19	8.0
Government Employed	30	12.7
Merchant	13	5.5
House wife	145	61.2
Non-Government	30	12.7
Monthly income		
<=2000 Eth Birr	78	32.9
2001-4500 Eth Birr	81	34.2
>4500 Eth Birr	75	31.6

Antenatal, labor and postnatal history

Majority (93.2%) of the mothers had a regular antenatal follow up where most (59.5%) of them had their follow up at the health center. Mothers whose pregnancy was for the first time were 105(44.3%). Place of delivery at the hospital and the health center were almost equal, 100 and 105 mothers respectively delivered at the hospital and the health center. Forty two percent of the mothers had a 2 to 8hrs of duration of labor, while 37% of them had labor that stayed for 8 to 16 hours. Mothers who delivered by SVD were 175(73.8%) and C/ S including the elective were 48(20.3%). (Table 2)

Of the total preterm infants enrolled in the study, 132 were males and 105 were females. Birth weight of the newborns had 4 categories where 139(58.6%) of them lied on the second category which is 1000-1499grams. Preterm infants who were on CPAP were 213(89.9%). Of these 109 of them were on CPAP for an average of 2-5 days. (Table 2)

Table 2 Antenatal, labor, post-natal and new born history (n=237)

Variable	Frequency (n=237)	Percent %
Antenatal follow up		
Yes	221	93.2
No	16	6.8
Duration of labor		
2-8hr	101	42.6
8-16hr	88	37.1
>16hrs	19	8.0
No labor	29	12.2
Mode of delivery		
SVD	175	73.8
Instrumental	14	5.9
C/S(elective)	4	1.7
C/S	44	18.6
Newborn sex		
Male	132	55.7
Female	105	44.3
Birth weight		
<1000grams	7	3.0
1000-1499grams	139	58.6
1500-1999grams	78	32.9
2000-2500grams	13	5.5
Was the baby on CPAP		
Yes	213	89.9
No	24	10.1

Knowledge of mother's about kangaroo mother care

Mothers were mention if they have heard about KMC before, 53.2% of them replied "yes" while the remaining 46.8% replied "no". Of those who said yes, majority 108 (45.6%) of them got the information from health professionals working in the hospital. Only 1 respondent told that she got the information from media. Fifty percent of the mothers replied that the information given by the health professionals was adequate and detailed enough. Half of the mothers (52.7%) knew that KMC was to carry your baby inside your chest in a skin to skin to contact. (Table 3)

Mothers were also mentioning if their husbands were willing to help them carry the baby in KMC; only 6(2.5%) mothers replied yes while the remaining 231 (97.5%) replied no. The reasons were husbands are not always with them and also the units don't allow fathers to come in 210(88.6%), the fathers didn't want to 20(8.4%), and 1(4%) mother though it was only a mother's role. (Table 3)

Table 3 Knowledge of mothers about kangaroo mother care (n=237)

Variable	Frequency (n=237)	Percent %
Heard about KMC?		
Yes	126	53.2
No	111	46.8
What did you know about KMC		
Carrying my baby in my chest with skin to skin contact	125	52.7
Carrying the baby in my chest without skin to skin contact	1	0.4
Where did you get the information from?		
Health professional from the hospital	108	45.6
Health center	12	5.1
Neighborhood	2	0.8
Media	1	0.4
Web search	3	1.3
Was the information detailed and adequate?		
Yes	120	50.6
No	6	2.5
Did your husband helped you carry KMC		
Yes	6	2.5
No	231	97.5
If no why?		
Only mothers can carry	1	.4
My husband is not with me always/he is not allowed to get in to the unit	210	88.6
My husband is not willing	20	8.4

Practice of kangaroo Mother Care

Majority 217(91.6%) of the mothers started the practice of KMC after 48hours. of the preterm infant being admitted; 17 (7.2%) started in 24- 48hours. where only 3 (1.3%) started with in 24hrs of admission. The mothers were asked if a demonstration was given by the nurse on how to hold a baby in KMC position; 229 (96.6%) of them answered 'yes'. Out of 8 mothers who answered 'No', 5 of them learned from another mother who were already practicing and 3 of them learnt by themselves by looking at a mother who is practicing. (Table 4)

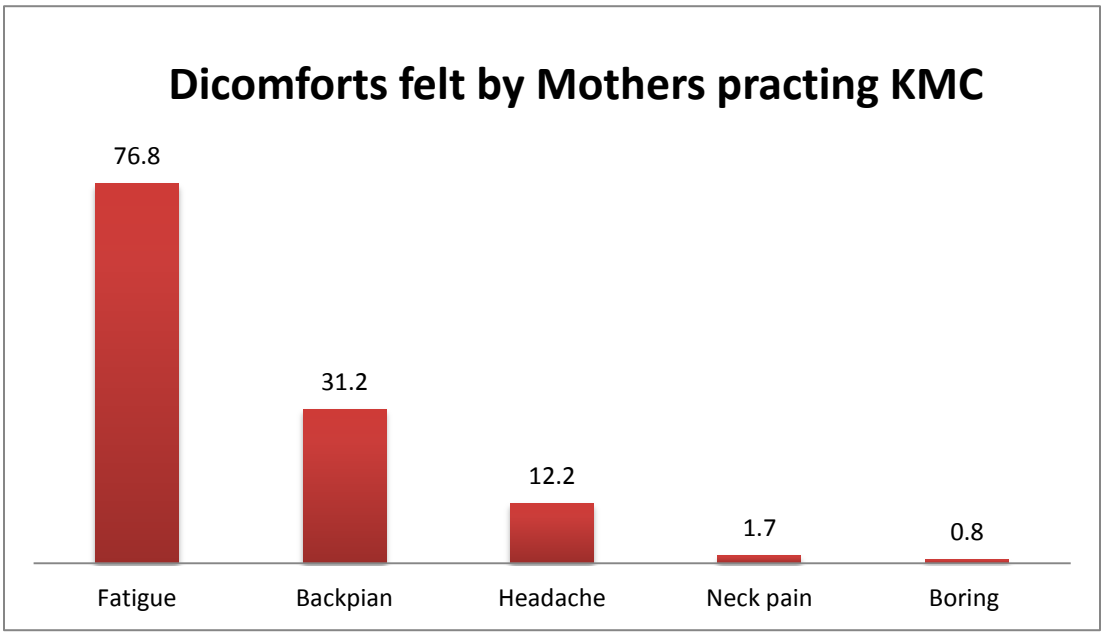

Figure 2 Discomforts reported by mothers practicing KMC

Major discomforts reported by the mothers were fatigue (76.8%), back pain (31.2%) and, headache (12.2%). Neck pain (1.7%) and feeling bored (0.8%) were the least reported discomforts. (Fig.2)

Table 4 Practice of kangaroo mother care (n=237)

Variable	Frequency (n=237)	Percent % (n=237)
Intermittent before continues KMC		
Yes	185	78.1
No	52	21.9
If yes, for how many days did you practice Intermittent KMC		
1-3 days	127	53.6
4-5 days	51	21.5
>5 days	7	3.0
Average time in a day to practice Intermittent KMC?		
<1hr	26	11.0
1-3hrs	141	59.5
>3hrs	18	7.6
How long has it been since you started KMC?		
3-7days	157	66.2
8-15 days	22	9.3
16-20days	5	2.1
>20days	1	.4
Is there an assigned nurse to the KMC room?		
Yes	236	99.6
No	1	.4
If yes does the nurse follows you and your baby regularly		
Yes, regularly	127	53.6
Yes ,not regular	88	37.1
No one comes regular except the rounds	21	8.9
Do you any difficulties to practice KMC with your baby		
Yes	167	70.5
No	70	29.5

Mother's awareness about benefits of KMC to baby.

Benefits of KMC to the preterm infant was one of the questions, where almost all 235 (99.2%) of the mothers replied that KMC is beneficial. Most mothers (36%) knew that KMC can help in regulating heart and respiratory rate, followed by 33% that it can produce heat, 22% maintains temperature and 7% that the baby will be fed regularly. (Fig.3)

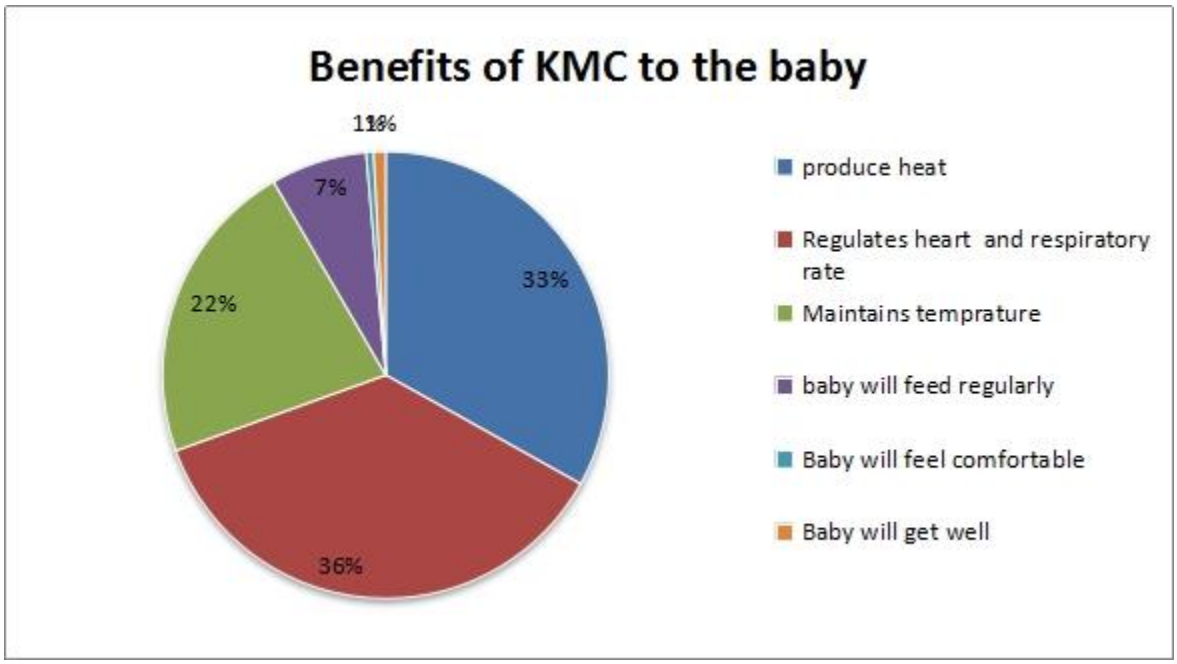

Figure 3 Benefits of KMC to the preterm infant reported by mother practicing KMC

Challenges on Kangaroo mother care practice

Challenges that mothers face while practicing KMC was asked from different domains. In relation to labor and post natal history; Mode of delivery was asked for those who had difficulties to practice; 98(41.1%) were spontaneous vaginal delivery, 65(27.4%) were C-section and 4(1.7%) were Instrumental deliveries. (Table 5)

More than half 130(54.9%) of the mothers practiced intermittent KMC while the remaining 107(45.1%) did the continuous KMC. Both types combined more than half 167 (70.5%) of the mothers didn't have difficulties to practice KMC while, 70(29.5%) of them had difficulties. From those who had difficulties 116(48.9%) of them mentioned they were feeling sick and the other 28(11.8%) of them had poor family support. (Table 5)

Mothers were asked if they have previous illness even before pregnancy, most of them had back pain 65(27.4%) followed by headache 30(12.7%), and abdominal pain 14(5.9%), which contributed to the challenge. From the postnatal illness those who had preeclampsia were higher 24(10.1%), followed by hypertension 14(5.9%) and Cardiac 4(1.7%). (Table 5)

Back pain was asked if it they had it before starting the practice, 16(6.8%) mothers replied that they had it before and of those 13(5.5%) of them mentioned that it got worse after the practice. Of those who had no back pain prior to the practice 63(26.6%) or 74(31.2%) of them reported that they have back pain after the practice. (Table 5)

Table 5 Challenges reported by mothers practicing KMC (n=237)

Variables	Frequency (n=237)		Percent %	
	Yes	No	Yes	No
Socioeconomic factors				
Sometimes I feel hungry and tired and I fail to hold my baby	207	30	87.3	12.7
I don't have enough clothes for me and my baby to change so sometimes I feel dirty to hold my baby	81	156	34.2	65.8
Infrastructure related				
Room is not comfortable	40	197	16.9	83.1
No water	37	200	15.6	84.4
No Bath room	169	68	71.3	28.7
No kitchen to cook or warm foods	168	69	70.9	29.1
No place to wash clothes	215	22	90.7	9.3
Lack of support from the Health professional				
Health care provider is not supportive	103	134	43.5	56.5
They don't encourage us	176	61	74.3	25.7
They don't understand how tiring it is	50	187	21.1	78.9
Family related factors				
Families are around me but they are not supportive	83	154	35	65
They don't understand the challenge	198	39	83.5	16.5
I have to think about my other children at home and that makes me stressed	46	191	19.4	80.6
Confidence				
I don't think I am doing enough for my baby	198	39	83.5	16.5
I think it is my fault that my baby is like this	48	189	20.3	79.7
I feel down because I have a preterm, LBW or SGA baby	27	210	11.4	88.6

Association of socio-demographic factors and other variables with the challenges faced by mothers related to KMC practice

Bivariate and multivariate analysis was done to look for association between the variables. The variable which showed association in binary logistic regression was entered in to multivariate regression to look for strong association. C/S and instrumental delivery were strongly associated with the challenges to the practice ([AOR=4.4, 95% CI: 2.20, 7.4]) and, ([AOR=1.38, 95% CI: 6.5, 15.6]) respectively. Mothers who had back pain ([AOR= 3.10, 95% CI: 0.94, 4.22]), abdominal pain ([AOR= 8.062, 95% CI: 1.352, 10.22]), head ache ([AOR= 2.228, 95%CI: 0.192, 9.813]) and those who reported discomfort of bed/chair ([AOR= 0.446, 95%CI: 0.96, 2.075]) were also significantly associated to the challenge to practice respectively. Regarding to the infrastructure mothers who reported to have shortage of clothes to change for themselves and for their preterm infants ([AOR= 3.96, 95%CI: 1.84, 8.58]) and, those who reported that the hospital has no area to wash our clothes were 2.49 more likely to be challenged ([AOR= 2.49, 95% CI: 0.75, 8.22]).

Table 6 Association of the selected variables with challenges faced by mothers practicing KMC (n=237)

Variables		Challenges **to practice KMC**		**COR(95%CI)**	**Adjusted OR(95%CI)**
		Yes	No		
Mode of delivery					
SVD		82(46.9%)	93(53.1%)	1	1
Instrumental		6(42.9%)	8(57.1%)	0.21[0.54-0.824]	1.38[6.5-15.6]
C/S(elective included)		8(33.35)	40(66.7%)	0.15[0.19-1.34]	4.4[2.20-7.4]
Reasons for discomfort					
Back pain	Yes	11(23.4%)	36(76.6%)	4.061[1.891-8.722]	3.10[0.94-4.22]
	No	20(55.5%)	16(44.4%)	1	1
Abdominal	Yes	2(6.5%)	29(93.5%)	17.99[4.107-78.799]	8.062[1.352-10.22]
Pain	No	15(60%)	10(40%)	1	1
Headache	Yes	7(58.3%)	5(41.7%)	0.886[0.266-2.949]	2.228[0.192-9.813]
	No	25(62.5%)	15(37.5%)	1	1
Discomfort of bed and chair	Yes	9(34.6%)	17(65.4%)	2.344[0.968-5972]	0.446[0.96-2.075]
	No	15(75%)	5(25%)	1	1
Back pain worsened after practice	yes	93(42.1%)	128(57.9%)	2.422[0.649-9.04]	5.01[0.81-7.78]
	No	3(23.1%)	10(76.9%)	1	1
Infrastructure related					
Not enough clothes to change for the mother and baby	Yes	23(28.4%)	58(17.6%)	2.21[1.24-3.94]	3.96[1.84-8.58]
	No	73(46.8%)	83(53.2%)	1	1
No place to wash clothes in the unit	Yes	81(37.7%)	134(62.3%)	3.54[1.387-9.062]	2.49[0.75-8.22]
	No	15(68.2%)	7(31.8%)	1	1

6. DISCUSSION

The objective of the study was to determine challenges faced by mothers who are practicing kangaroo mother care in Neonatal intensive care unit in public hospitals.

Previous studies and the WHO suggest that KMC is one of a proven intervention for conventional neonatal care in low resource settings. (3, 20). As the name indicates the primary person to be involved in this method is the mother who is in her very early post-natal period. Thus, it is not without a challenge for the mother to practice KMC to save her preterm infant. Major challenges that the current study found out are related to maternal, neonatal, and hospital infrastructure factors. These findings were found with the results of previous studies which also assumed scarcity of resources, lack of assistance with KMC practice and other obligations as challenges faced by mothers. (19).

In the current study there was no association in terms of the socio-demographic characteristics in order for the mothers to be challenged while practicing KMC. From the antenatal, labor and postnatal history; except the mode of delivery other variables didn't show any associations with the challenges of the mother to practice KMC.

Comparing the current study with a study done in Malawi, knowledge wise the study in Malawi found out that (7/15) of the mothers know about KMC compared to 53.2% in the current study. In the same study most (5/15) of the mothers got the information from their neighbors while in the current study most (45.6%) got the information form the health professionals in the hospital. (2, 29) From the current study, mothers were aware of the benefits of KMC, 88.2% know that KMC was beneficial to regulate the baby's heart and respiratory rate. This is indicative of how the health education provided by the health professionals is useful. A study in Ghana in Tamale hospital also supports this finding stating that if the knowledge about KMC is adequate among the health professionals then is the knowledge among the mothers. (37)

Using the logistic regression model, maternal, and hospital infrastructure factors, which are mode of delivery, reported maternal discomforts and factors related to not having extra clothe and no clothe washing were significantly associated with the challenges to the practice. From the three mode of deliveries, having SVD as a reference those mothers who delivered by C/S

(elective included) were 4.4 times more likely to be challenged to practice KMC ([AOR=4.4, 95% CI: 2.20, 7.4]). Those mothers who delivered by instrumental delivery were also 1.38 times more likely to be challenges to practice KMC ([AOR=1.38, 95% CI: 1.26, 15.6]). This results is very similar to a study done at Yirgalem town, southern Ethiopia where mothers who delivered by SVD were 4.3 times more likely to practice KMC than those who had caesarean section delivery ([AOR= 4.341, 95%CI: 1.435, 13.130]). (38)

In previous studies it is clearly stated that mothers practicing KMC need psychological support at every step of the practice specially those mothers whose preterm infants were sick prior to the KMC practice. (2, 3, 28) A similar pattern of results was obtained in this study; almost all 89.9% of the preterm infants who were included in the study were on CPAP, an oxygen therapy. Where 109/ 231(46.4%) of them stayed 2- 5 days on CPAP prior to the initiation of KMC of these 101(92%) of the mothers were worried about their babies' final outcome. This is indicative of how the pre KMC situation of the newborn impacts the mothers to be stressed while on practice.

The multivariate regression statistics revealed that reasons for discomfort reported by mothers who are practicing KMC, and those which have a very strong association with the challenges are, back pain, abdominal pain, head ache and discomfort of bed/chair. Mothers who had back pain were 3.10 times ([AOR= 3.10, 95% CI: 0.94, 4.22]), abdominal pain were 8.06 times ([AOR= 8.062, 95% CI: 1.352, 10.22]), had head ache were 2.228 times ([AOR= 2.228, 95%CI: 0.192, 9.813]) and those who reported discomfort of bed/chair were 0.4 times ([AOR= 0.446, 95%CI: 0.96, 2.075]) more likely to be challenged for the practice respectively. Back pain which worsened after the initiating of the practice in particular was a challenge that was strongly associated with the challenge. Those whose back pin worsen after the practice were 5 times more likely to be challenges to practice than those whom back pain didn't worsen after the practice ([AOR= 5.01, 95% CI: 0.81, 7.78]). There is no adequate research which can help us compare this finding with other studies. Though this can be related to the nature of the practice as it needs the mother to be well medically, and comfortable which indicates that if the mother have any of the above mentioned medical condition in addition to the discomfort it can be very challenging for the mother to practice the method effectively.

A study conducted in India, Kalawati Saran Children's hospital supports that family support is very crucial for both the mother and the preterm infant while practicing KMC. Likewise, results of the current study revealed family support was not adequate. This was reported by majority of the mothers 231 (97.5%); support from their husbands' was very minimal especially when it comes to the actual practice holding the baby in KMC position. From those 210(88.6%) gave a reason, which is due to the unit's policy that didn't allow fathers or other family members to accompany the mother. (39)

Fatigue and common post-natal illness after delivery can affect practice of kangaroo mother care. Kangaroo method of care needs assistants because mothers alone cannot hold a baby in kangaroo position for 24 hours especially if the mother is sick and obviously very stressed to the fact that preterm infant is admitted to the NICU where they are aware that their newborn is not feeling well. It is better to have a separate KMC rooms so the space can be large to accommodate at least one relative of the mother to provide assistance. (2, 29, 30)

Some studies agree that hospital infrastructure could be a possible challenge for the practice of KMC. (2, 29) It was interesting to find the current study in line with previous studies, that mothers did actually face difficulties related to the hospital infrastructure. With the current finding mothers who reported as they have shortage of clothes to change for themselves and for their preterm infants were 3.96 times more likely to be challenged ([AOR= 3.96, 95%CI: 1.84, 8.58]). With the same token mother who reported that the hospital has no area to wash our clothes were2.49 more likely to be challenged ([AOR= 2.49, 95% CI: 0.75, 8.22]). The KMC rooms are not well designed in order to fulfill what a mother could want in her early post-natal period plus carrying her preterm infant in KMC method. This mother if it was her home in this time given the Ethiopian culture it would be a very different story in how much care and support she would get from her families, friends and neighborhood. Infrastructure wise she can also access her own bath room and toilet which is clean, she can cook what she wants and she can change her clothe daily. All these basic needs have to be fulfilled by the hospital for the mother to comfortably practice KMC. (30)

The mother who is practicing KMC experiences different challenges from various viewpoints, physiological which is related to the post-natal period; psychological and emotional due to the

stress that her preterm infant is admitted to the NICU and she has to be there for some unknown time to support her baby; social that she is not back home after delivery and misses the social contribution; also economically she has extra expenses because she is staying away from home for some time. This will be worse if the mother has another child at home, and has minimal family support plus if she is from the rural part of the country. All these given she still tries and tolerates all the challenges to give her best for the survival of her preterm infant and while doing so she needs to be supported in all the ways possible so she can be part of the clinical care provided for the best outcome.

7. STRENGTH & LIMITATION

7.1. Strength

- This study is one among very few studies which assess the challenges faced by mothers practicing kangaroo mother care.
- The study included five public hospitals, so the results of the study can be generalizable to the source population at large.

7.2. Limitations of the study

- There was lack of adequate literatures in Ethiopian situations that prevents further elaboration.
- The study used a quantitative method.

8. CONCLUSION

KMC is a proven intervention method for the survival of preterm and LBW infants in a resource limited settings. The mother of these preterm infants is the primary person who is involved in the practice. This study enrolled 237 mothers who are practicing KMC in NICU's of public hospital, having a general objective of assessing the challenges they face during the practice. This study demonstrated that 54.9% of the mothers practiced intermittent KMC while 45.1% of them practiced continuous KMC. Mothers who delivered by caesarian section and instrumental delivery were found to be more challenged to practice KMC. Moreover, mothers who encountered postnatal illness like back pain , abdominal and head ache together with infrastructure problems like uncomfortable bed/chairs and shortage of clothes to change, and lack of clothe washing area were challenged while practicing KMC. Challenges of mothers practicing KMC should be supported and encouraged adequately as they are being part of the clinical care for a better outcome of the preterm and LBW infant.

9. RECOMMENDATION

- The hospital NICU's should amend their family visit policies especially for those mothers who are practicing KMC and of those in particular for those who delivered by C/section.
    - Family members specially the husband should be allowed to be with the mother and help her with the practice
- The hospital should rearrange the KMC room infrastructure in a way they are comfortable to the mother's to practice the method without a challenge
- Besides the health education that the health professionals provide they should also be able to support and encourage the mother psychologically and emotionally.
- Policy wise, responsible stakeholders should consider the findings of this research and modify the KMC implementation guideline to include the above recommendations.

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8. ANNEXES

8.1 .Annexes I: Participant Information Sheet

My name is _____. Currently I am a graduate student at Addis Ababa University, College of Health Sciences, School of Allied Health Sciences, Department of Nursing and Midwifery. And now I am conducting a research to assess Challenges faced by mothers practicing Kangaroo mother care in Neonatal intensive care unit in public hospital Addis Ababa.

Title of the research-

Challenges faced by mothers practicing Kangaroo mother care in Neonatal intensive care unit in public hospitals, Addis Ababa, Ethiopia, 2020.

Objective:

To identify challenges faced by mothers practicing Kangaroo mother care in Neonatal intensive care unit public hospitals, Addis Ababa Ethiopia 2020.

Participants: purposefully selected mothers having neonates in the NICU and practicing KMC in public hospitals

Potential Risks: There is no foreseen risk by being participating in this study.

Benefits: No financial benefits are related with this study. But by participating in this study, you

will improve the care and setting of NICU.

I would like to ask you few questions. Your honest response to the questions can make the study to achieve its objective. All the information that you give will be kept confidential and private.

Only the principal investigator and interviewer will have access to the information. You are kindly requested to respond voluntarily. You can also choose not to participate in this study or if you become uncomfortable during the study, you will be allowed to leave the study at any time.

At any time if you have questions, you can contact me by using the following addresses.Asekal Assefa Mobile;+251-911-874106,E-mail;askual77@gmail.com.

8.2. Annex II: Questionnaire; English Version

Part 1.Socio demographic Characteristics

Socio demographic Characteristics			
Q.No	**Questions**	**Response**	**Remark**
Which type of KMC is the mother currently (at the time of interview) practicing? ☐ Intermittent ☐ Continous			
1.	Age	1. 15-19 2. 20-24 3. 25-29 4. 30-34 5. >35	
2.	Maritial Status	1. Married 2. Single 3. Divorced 4. Widowed	
3.	Educational level	1. Illiterate 2. Read and write 3. Primary 4. Seconadary 5. Higher education	
4.	Place of Residence	1. Urban 2. Rural	
5.	Occupation	1. Student 2. Government Employed 3. Merchant 4. House wife 5. Non-Government 6. Others(Specify) _____	

6.	Monthly income	1. <2000birr 2. >2000birr	

Part ll. Specific to the last pregnancy, labor and delivery that you had?

Obstetric History			
Q.No	**Questions**	**Response**	**SKIP**
1.	Did you have a regular Antenatal follow up?	1. Yes 2. No	If no then skip to quation no 3
2.	If yes, where was your follow up?	1. Health center 2. Hospital(government) 3. Hospital(private)	
3.	No of pregnancy?	1. Once 2. Twice 3. 3 times 4. More than 3	
4.	No of children alive	_____	Write the number given
5.	Number of died children?	_____	Write the number given
Questions related to the current pregnancy			
6.	Place of delivery?	1. Home 2. Health center 3. Hospital(government) 4. Hospital(private)	
7.	Duration of labour?	1. 2-8hr 2. 8-16 hr 3. >16 hrs 4. No labour	
8.	Mode of delivery?	5. SVD 6. Instrumental 7. C/S(elective) 8. C/S	
Neonatal Data			

9.	Sex of the newborn	1. Male 2. Female	
10.	Gestational age	1. <28 weeks 2. 29-31weeks 3. 32-36 weeks	
11.	Birth weight	4. <1000grams 5. 1000-1499grams 6. 1500-1999grams 7. 2000-2500grams	
12.	NICU Admission age	1. <24 hrs 2. 24-48hrs 3. >48hrs	
13.	Was the baby on CPAP/intranasal oxygen?	1. Yes 2. No	For intermitant KMC see yourself if the baby is on CPAP/oxygen? And ask for how long it has been?
14.	If yes? For how long?	1. <1day 2. 2-5days 3. >5days	

Part- III Knowledge of mother's about kangarro mother care

Q.No	Questions	Response	skip
1.	Have you heard about KMC before?	1. Yes 2. No	If no then skip to quation no 5
2.	What do you know about KMC?	1. Carrying my baby in my chest with skin to skin contact 2. Carrying the baby without in my chest skin to skin contact 3. Carrying the near to me always 4. Other specify _____	
3.	Where did you get the information from?	1. Health professional from the hospital 2. Health center 3. Neighborhood 4. Media 5. Web search 6. Other (specify)_____	

4.	If from Health professional form the hospital? Was the information detailed and adequate?	1. Yes 2. No	
5.	Do you think that KMC will benefit for your baby?	1. Yes 2. No	If no then skip to quation no 7
6.	If yes, what is important of KMC, circle more than one answers	1. It produce heat 2. It regulate heart beat and respiratory rate 3. It maintain the temperature for the baby 4. Baby will get feed regularly 5. Baby feel comfortable 6. Baby will get well/alive	
7.	Do you Know discomfort of using KMC	1. Yes 2. No	
8.	If yes, what are discomfort do you have using KMC	1. Backpain 2. Abdominal pain 3. Headache 4. Discomfort of bed or chair	
9.	If you are carried your husband can carry your baby with KMC	1. Yes 2. No	If yes then skip to Part 4 quation no 1
10.	If NO what was the reasons	1. Only mothers can carry consider for the father 2. My husband is not with me always 3. I don't want to give my husband	

Part IV:Practice of kangaroo mother care

Q.No	Questions	Response	Skip
1.	When did you start KMC?	1. With in 24hrs of admission 2. 24- 48 hrs 3. >48 hrs	

2.	Before your first practice did the nurse showed you how to hold your baby in KMC position?	1. Yes 2. No	If yes then skip to quation no 4
3.	If No , then who showed you how to hold your baby in KMC position?	1. Another mother practicing KMC 2. By my self-looking at other mothers 3. Other (specify) _____	
4.	Have you practiced intermittent KMC before starting the continuous one?	1. Yes 2. No	If No skip to question No 8
5.	If yes, for how many days did you practice Intermittent KMC	1. 1-3 days 2. 4-5 days 3. >5days	
6.	On Avarge for how much time a day did you practice Intermittant KMC?	1. <1hr 2. 1-3hrs 3. >3hrs	
7.	How long has it been since you started KMC?	1. 3-7days 2. 8-15 days 3. 16-20days 4. >20days	
8.	Is there an assigned nurse to the KMC room?	1. Yes 2. No	If no then skip to part 5 quation no 1
9.	If yes does the nurse follows you and your baby regularly (every 4-6hrs)?	1. Yes,regularly 2. Yes ,not regular 3. No one comes regurlaly excpet the rounds	

Part V: challenges on Kangarro mother care practice

Q.No	Questions	Response		Skip
1.	Do you any difficulties to practice KMC with your baby	1. Yes 2. No		If no then skip to quation no 4
2.	If yes, what was difficulties not to practice KMC	1. Poor family suppourt 2. I am sick 3. I am fear		
3.	If you are sick what was the reasons for KMC practice	1. mode of delivery (C/S,)	C/S	
			Insturemental,	
			SVD	
		2. post natal illness other than mode of delivery (DM, eclapsia	DM	
			Cardiac	
			HTN	
			Others_____	
		3. previous illness (even before pregnancy which made it challenging for her to practice)	Back pain	
			Head ache	
			Others_____	
		4. others (specify)_____		
4.	Did you have a back pain before you started the practice	1. Yes 2. No		If no then skip to quation no 6
5.	If yes did it worsen after the practice	1. Yes 2. No		If yes then skip to quation no 7
6.	If No did you have it now after the practice	1. Yes 2. No		
7.	What difficult you have in KMC practice, it interrupt you continue to KMC	1. Fatigue 2. Back pain 3. Neck pain 4. Boring 5. Headache		
8.	What difficult you have in KMC practice Socio economic factors	1. Sometimes I feel hungry and tired and I fail to hold my baby 2. I don't have enough clothes for me and my baby to change so		

		sometimes I feel dirty to hold my baby 3. I can't afford to buy extra clothing(diaper) that I can use as a diaper	
9.	What difficult you have in KMC practice Instutitional infrastructure related problems	1. the room is not comfortable, 2. no water, 3. no bath room 4. no toilet 5. no kitchen to cook or warm foods 6. no place to wash clothes 7. over crowding, 8. the beds are not comfortable 9. there are no suitable chairs for intermittent KMC (re-clining beds)	
10.	What difficult you have in KMC practice Lack of support from the Health professional	1. Health care provider is not supportive 2. They don't encourage us 3. They don't understand how tiring it is	
11.	What difficult you have in KMC practice Family related factors	1. I am rural area and I don't have any one around to help and support me 2. Families are around hear but they are not supportive 3. They don't understand the challenge 4. I have to think about my other children at home and that makes me stressed	
12.	What difficult you have in KMC practice in confidence	1. I don't think I am doing enough for my baby 2. I think it is my fault that my baby is like this 3. I feel down because I have a preterm, LBW or SGA baby	
13.	What difficult you have in KMC practice Outcome related	1. I am worried about my baby's final outcome	

		(stressed) 2. Sometimes I feel like I am suffering for nothing	

8.3 Annex IV Amharic version

መመሪያ ፡- ከዚህ በታች የተዘረዘሩት መጠይቆች በጥናታዊ ፅሑፉ ውስጥ የተካተቱ እና በስነ -ጽሁፍ ዓላማ ላይ በመመርኮዝ የተጻፉ በመሆናቸዉ እርሶም የሚያዉቁትን (ትክክለኛ የሆነዉን) መረጃ በመሙላት እነዲተባበሩን በትህትና እንጠይቃለን፡

ክፍል 1. የእናትየው መረጃዎች

የናትየዋ መረጃ ዝርዝር			
ቁጥር	**ጥያቄዎች**	**መልስ**	**ውጤት**
የትኛውን አይነት ነው የምትይዥው ☐ አልፎ አልፎ ☐ በተከታታይ			
1.	እድሜ	1. 15-19 2. 20-24 3. 25-29 4. 30-34 5. >35	
2.	የቤተሰብ ሁኔታ	1. ያገባ 2. ያላገባ 3. የፈታ 4. በሞት የተለየ	
3.	የተምህርት ሁኔታ	1. ያለተማረ 2. ማንበብና መጻፍ 3. ከ 1-6 ያጠናቀቀች 4. ከ7-12 ያጠናቀቀች 5. ሰርትፍኬትና ከዚያ በላይ	
4.	የሚኖሩበት ቦታ	1. ከተማ 2. ገጠር	

5.	የስራ ሁኔታ	1. ተማሪ 2. የመንግስት ሰራተኛ 3. ነጋዴ 4. የቤት እመቤት 5. የግል ድርጅት 6. ሌላ ካለ(ይግለጹ) _____	
6.	ወርሀዊ ገቢ	1. <2000birr 2. >2000birr	

ክፍል 2. በእርግዝናና በወሊድ ወቅት የነበረ ሁኔታ

የእርግዝና ሁኔታ			
ተቁ	**ጥያቄ**	**መልስ**	**ውጤት**
1.	የቅድመወሊድ ክክትትል ነበረሽ ?	1. አዎ 2. አይደለም	
2.	አዎ ከሆነ የት ነበር?	1. ጤና ጣቢያ 2. የመንግስት ሆስፒታል 3. የግል ሆስፒታል	
3.	ስንተኛ እርግዝናሽ ነው?	1. የመጀመሪያየ 2. ሁለተኛዩ 3. ሶስተኛ 4. ከ3 በላይ	
4.	ስንት ልጅ አለሽ?	_____	
5.	የ ሞተ ልጅ አለሽ? ስንት?	_____	
ከአሁኑ እርግዝና ጋር የተያያዙ ጥያቄዎች			
1.	የት ነው የወለድው?	1. ቤት 2. ጤና ጣቢያ 3. የመንግስት ሆስፒታል 4. የግል ሆስፒታል	
2.	ምጥ ምን ያህል ጊዜ ቆየብሽ?	1. 2-8ሰአት 2. 8-16ሰአት	

		3. >16 ሰአት 4. ምጥ አልነበረኝም	
3.	በምን ወለድሽ?	1. በምጥ 2. በመሳሪያ 3. በኦፐራሲዮን (ፊልጌ) 4. በኦፐራሲዮን	
ከጨቅላ ህጻኑ ጋር የተያያዙ ጥያቄዎች			
1.	ጾታ	1. ወንድ 2. ሴት	
2.	ካረገዝሽ ስንት ሳምንት ሆነሽ?	1. <28 ሳምንት 2. 29-31ሳምንት 3. 32-36 ሳምንት	
3.	ክብደ(ቱ/ ቷ)	1. <1000 ግራም 2. 1000-1499ግራም 3. 1500-1999 ግራምs 4. 2000-2500 ግራም	
4.	የጨቅላ ህጻናት ክፍል መች ገባ(ች)?	1. <24 ሰአት 2. 24-48 ሰአት 3. >48 ሰአት	
5.	ልጅሽ ሲፓፕ ወይንም ኦክስጅን ላይ ነበረ(ች)?	1. አዎ 2. አልነበረም(ችም)	
6.	አዎ ከሆነ ለስንት ቀን?	1. <1ቀን 2. 2-5ቀን 3. >5ቀን	

ክፍል 3 የናትየዋ የካንጋሮ አያያዝ በተመለከተ

ተቁ	**ጥያቄ**	**መልስ**	**ውጤት**
1	ስለ ካንጋሮ አያያዝ ዘዴ ሰምተሽ ታውቂያለሽ?	1. አዎ 2. አይደለም	
2	ከሰማሽ እንዴት ነው የምትይዥው?	1 ደረቴ ውስጥ ከትቸ በመያዝ 2 ደረቴ ውስጥ ሳላሰገባ በመያዝ	

		3 ሁልጊዜ አጠገቡ በመሆን 4 ልላ ካለ (ይገለጽ)	
	ከየት ነው የሰማሽው?	1. ሆስፒታል ውስጥ ከ ጤና ባለሙያዎች 2. ከጤና ጣቢያ 3. ከጐረቤት 4. ከመገናኛ ብዙሀን 5. ከድህረ ገጽ 6. ሌላ ካላ (ይገለጽ) _____	
	ከሆስፒታል ከ ጤና ባለሙያዎች ከሆነ የተነገረሽ ግልጽና በቀ ነው?	1. አዎ 2. አይደለም	
	በካንጋሮ አያያዝ ዘዴ ልጅሽን መያዝሽ ጥቅም አለው ብለሽ ታስቢያለሽ?	1. አዎ 2. የለውም	
	አዎ ከሆነ ጥቅሙ ምንድን ነው ብለሽ ታስቢያለሽ?	ነ ሙቀት እንዲኖረው ያደርጋል 2 የሙቀቱ መጠኑ እንዲስተካከል ያደርጋል 3 አተነፋፈሱንና የልብ ምቱን ስለሚያስተካክል 4 ልጇን በቀላሉ ማትባት ስለምችል 5 ልጇን የሚመቸው ስለሚመስለኝ 6 ልጇ በሂዎት መኖሩን በቀላሉ ማዎቅ ስለምችል	

7	የካንጋሮ እናት ስትይዥ ምቾት	1 አዎ	

	አይሰማሽም	2 አይደለም	
8	አዎ ከሆነ ምንድን ነው የማይመችሽ?	ነ ወገቤን ያመኛል 2 ሆዴን ያመኛል 3 አራሴን ያመኛል 4 አልጋውና ምንበሩ አይመቸኝም	
9	ባለቤትሽ የካንጋሮ አያያዝ ያግዝሻል?	1. አዎ 2. አይደለም	
ነ0	አይደለም ከሆነ ለምን?	1. እናቴ ስለምታግዘኝ 2. ባለቤቴ ሁልጊዜ ቤት ስለማይኖር 3. ባለቤቴ መያዝ ስለማይፈልግ _____	

ክፍል 4 የካንጋሮ አያያዝን ተግባራዊ የማድረግ ጥያቄዎች

ተቁ	ጥያቄዎች	መልስ	ውጤት
1	በካንጋሮ አያያዝን ዘዴ መች መያዝ ጀመርሽ?	1. በገባ በ24 ሰአት ውስጥ 2. 24- 48ሰአት 3. >48 ሰአት	
1	መጀመሪያ ልጅሽን ከመያዝሽ በፊት ነርሶቹ እንዴት መያዝ እንዳለብሽ አሳይተውሻል?	1. አዎ 2. አላሳዩኝም	
2	4.አላሳዩኝም ከሆነ እንዴት መያዝ እንዳለብሽ ማን አሳየሽ?	1. ሌላ እናት ካንጋሮ የምትይዝ 2. ከሌላ እናት እራሴ አይቸ 3. ሌላ ካለ (ግለጽ) _____	
1.	በካንጋሮ አያያዝ ሙሉ ቀን ከመያዝሽ በፊት አልፎ አልፎ ትይዥ ነበር?	1. አዎ 2. አይ	አይ ከሆነ ወደ ጥያቄ 16 ይለፉ
2.	አዎ ከሆነ ለስንት ቀን ትይዥ ነበር?	1. 1-3 ቀናት 2. 4-5 ቀናት 3. >5ቀናት	
3.	በአማካኝ በቀን ውስጥ ለስንት ሰአት ትይዣለሽ?	1. <1 ሰአት 2. 1-3ሰአት 3. >3ሰአት	
4.	ካንጋሮ አያያዝ መያዝ ከጀመርሽ ስንት ጊዜ ሆነሽ ?	1. 3-7ቀናት 2. 8-15 ቀናት 3. 16-20ቀናት	

		4. >20ቀናት	
5.	ካንጋሮ አያያዝ ክፍል ውስጥ የሚመደብ ነርስ አ ለ ?	1. አዎ 2. የለም	
6.	አዎ ከሆነ አንችንና ልጅሽን ነርሟ(ሱ) ይከታተሉሻል?	1. አዎ በተከታታይ 2. አዎ , አልፎ አልፎ 3. ከራውንድ በስተቀር ማንም አይመጣም	

ክፍል 5: ካንጋሮ አያያዝ የሚይዙ እናቶች የሚያጋጥሙ ችግሮች

ተ ቁ		መልስ	ውጤ ት
	የካንጋሮ አያያዝ እንዳትይዥ የሚያስቸግርሽ ነገር አለ?	1. አዎ 2. የለም	
	አዎ ከሆነ ችግሮቹ ምንድን ናቸው?	1. የሚያግዘኝ ቤተሰብ ስለሌለኝ 2. ስለሚያመኝ 3. የሚከብድ ስለሚመስለኝ	
	ካንጋሮ አያያዝ በምትይዥበት ወቅት የሚያምሽ ከሆነ ህመምሽ ምንድን ነው?	1. የወለድኩበት ምክንያት 2. ተጓዳኝ በሽታ ስለሚያመኝ 3. ከዚህ በፊት የነበረ ህመም ስለሚሰማኝ 4. ሌላ ካለ (ይገለጽ)	
	ካንጋሮ አያያዝ መያዝ ከመጀመርሽ በፊት ወገብሽን ያምሽ ነበር?	1. አዎ 2. አይደለም	
	አዎ ከሆነ ህመሙ ከበፊቱ ጨምሯል?	1. አዎ 2. አይደለ	
	አይደለም ከሆነ ከመያዝሽ በኋላ ነው?	1. አዎ	

		2. አይደለም	
	የካንጋሮ አያያዝ እንዳትተገብሪ የሚረብሸሽ ነገር ምንድን ነው?	1. ስለሚደክመኝ 2. ወገቤን ስለሚያመኝ 3. አንገቴን ስለሚያመኝ 4. መያዝ ስለሚሰለቸኝ 5. ራሴን ስለሚያመኝ	
	የእውቀት ማነስ	1. ልጄን መች መያዝ እንዳለብኝ አላውቅም 2. የ ካንጋሮ አያያዝ ጥቅምን ስለማላውቅ 3.	
	ማህበራዊና ኢኮኖሚያዊ ችግሮች	1. አንዳንድ ጊዜ ሲርበኝና ሲደክመኝ ልጄን መያዝ ይከብደኛል 2. በቂ የምቀይረው ልብስ ስለሌለኝ ልጄን መያዝ የማቆሽሽው ይመስለኛል 3. ዳይፐር መግዛት አቅሜ አይፈቅድም	
	ከ ሆስፒታሉ መሰረተ ልማት የተያያዙ ችግሮች	1. ክፍሉ ምቹ አይደለም 2. ውሃ የለም 3. መታጠቢያ የለም 4. ሽንት ቤት የለም 5. ለምግብ ማብሰያና ማሞቂያ የለም 6. ልብስ ማጠቢያ የለም 7. ክፍሉ የተጨናነቀ ነው 8. አልጋው ምቹ አይደለም 9. ምቹ ወንበር የለም	
	ከጤና ባለሞያ እርዳታ ማግኘትጋር ተያይዞ ያሉ ችግሮች	1. የጤና ባለሞያው ድጋፍ አያደርግም 2. አያበረታቱም 3. አድካሚ እንደሆነ አይረዱም	
	ከቤተሰብ ጋር የተያያዙ ችግሮች	1. ከገጠር ስለመጣው የሚረዳኝ ሰው የለኝም 2. ቤተሰቦቼ አይረዱኝም 3. ችግሮችን አይረዱኝም 4. ሌሎች ልጆች ቤት ትቼ ነው የመጣውት	
	በራስ መተማመን	1. ለልጄ በቂ ነገር እያደረኩ አይደለም 2. በእኔ ምክኒያት ነው ልጄ እንደዚየሆንው 3. ልጄ ያለጊዜው ስለተወለድ የበታችነት ስሜት ይስማኛል	
	ውጤት ጋር የተገናኘ	1. ስለመጨረሻ ውጤት ተጨንቄያለሁ 2. ያለምንም ምክንያት የምለፋ ይመስለኛል	