ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

Effective Early Kangaroo Mother Care Coverage and Associated Factors among Low-Birth-Weight Neonates in Selected Hospitals in Oromia Region, Ethiopia

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Study area	Oromia region, Ethiopia
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DECLARATION SHEET

This is to certify that the thesis entitled “Effective Early kangaroo mother care coverage and associated factors among low-birth-weight neonates in selected hospitals in Oromia region, Ethiopia” was submitted as part of the requirements for the Master of Public Health Degree in the field of Reproductive, Family and Population health. It was prepared solely by myself, and I have not submitted, in whole or in part, any previous application for a master's degree. Except where it states (AAU) otherwise by reference or acknowledgment, the work presented is entirely my own.

Name of the candidate: Beyene Roba (BSc Public Health)

Signature_____ Date _____

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APPROVAL SHEET

As thesis research advisor, I hereby certify that I read and evaluated this thesis prepared under my guidance by Beyene Roba, entitled: "Effective Early kangaroo mother care coverage and associated factors among low-birth-weight neonates in selected hospitals in Oromia region, Ethiopia" in partial fulfillment of the requirements for the Degree of Master of Public Health in Reproductive, Family and Population health is recommended to be submitted as fulfilling the thesis requirement and regulations of the University and meets the accepted standards to originality and quality.

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Abiy Seifu Estifanos: Signature _____ Date _____

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Signed by Examining Committee:

Chairperson _____ Signature _____Date_____

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Acronyms/Abbreviations

AOR	Adjusted Odds Ratio
CMC	Conventional method of care
COR	Crude odds Ratio
CI	Confidence interval
C/S	Caesarean section
DHS	Demographic and Health Survey
EBMF	Exclusive breast milk feeding
EEBMF	Early Exclusive breast milk feeding
EDHS	Ethiopia demographic health survey
EeKMC	Effective early KMC
EmONC	Emergency Obstetric and Newborn Care
ETB	Ethiopian birr
ELBW	Extreme low birth weight
FMOH	Federal minister of health
HCP	Healthcare provider
ICU	Intensive care unit
IDI	In depth interview
KMC	Kangaroo mother care
LBW	Low birth weight
LMICs	Low- and Middle-Income Countries
NEC	Necrotizing Enterocolitis
NG	Nasogastric tube
NICU	Neonatal intensive care unit
PI	Principal investigator
RCT	Randomized control trial
SSC	Skin-to-skin contact
WHO	World health organization
VLBW	Very low birth weight

Abstract

Background: Globally, an estimated 13.4 million newborns were born preterm in 2020, with Southern Asia and sub-Saharan Africa contributing to 65% of cases. Despite the WHO endorsement of KMC for preterm infants, global KMC rates remained below 5% in 2021. In Ethiopia, despite efforts to expand KMC, less than 10% of eligible newborns received any form of KMC in 2021.

Objective: This study aimed to determine the coverage of effective early Kangaroo Mother Care (EeKMC), examine associated factors, and identify facilitators and barriers to EeKMC initiation among <2000grams newborns in selected hospitals in the Oromia region, Ethiopia, in 2023.

Methods: A facility-based cross-sectional study utilizing mixed methods was conducted. Secondary data were employed to determine EeKMC coverage (which is defined as proportion of <2,000g newborns for whom KMC, consisting of at least 8 hours of skin-to-skin care plus exclusive breast milk feeding, was provided within 24 hours after birth) and associated factors, while in-depth interviews and observations were carried out to explore barriers and facilitators of effective early KMC. The study spanned one year, from October 2022 to November 2023. We included 713 eligible low-birth-weight newborns in the quantitative data analysis. We applied bivariate and multivariate logistic regression analyses, with a significance level set at $p < 0.05$. We used thematic analysis to analyze the qualitative data.

Result: Among 713 <2,000g newborns 4.6% (33/713) received EeKMC, while 55.5% (396/713) received exclusive breast milk feeding within 24 hours after birth. Newborns in the incubator (compared to those outside) [AOR=0.07; 95% CI (0.015-0.34)] were less likely to receive EeKMC.

Our qualitative data identified health system related **barriers** to EeKMC including inadequate healthcare infrastructure, skill gaps, low motivation of healthcare provider, maternal emotional status, post-operative pain, lack of knowledge about KMC, and cultural norms that hasten mothers to go home after birth. **Facilitators** comprise quality improvement initiatives, visual aids, effective counseling, maternal willingness and regular pregnancy follow-up.

Conclusion and recommendation: Our study found that the coverage of EeKMC is low. Comprehensive interventions addressing issues ranging from healthcare infrastructure inadequacies to cultural norms should be implemented.

Key words: - Oromia, effective KMC, early KMC, enablers, barriers.

1. INTRODUCTION

1.1. Background

Globally, an estimated 13.4 million newborn babies were born preterm (<37 weeks) in 2020, compared with 13.8 million in 2010. The global annual rate of reduction was estimated at -0.14% from 2010 to 2020. Southern Asia and sub-Saharan Africa accounted for approximately 65% of all preterm births globally in 2020 (1). In Ethiopia, the overall pooled prevalence of preterm birth was 10.48% in 2020 (2) and 13% of babies weighed less than 2.5 kg at birth (3).

Preterm and LBW infants have a 2- to 10-fold higher risk of mortality than infants born at term (at least 37 weeks' gestation) and with normal birth weight (at least 2.5 kg), and are particularly vulnerable to impaired respiration, difficulty feeding, growth failure, poor body temperature regulation, and infection (4,5). Preterm birth complications are the leading cause of death among children under 5 years of age, responsible for approximately 900,000 deaths in 2019 (6), and globally 5 million children die before the age of 5, with nearly half of them (2.3 million) dying during the neonatal period. Of all neonatal deaths, over 1 million occur within the first 24 hours of birth, and preterm birth is a risk factor in over 50% of all neonatal deaths (6). 60–80% of all newborn deaths each year are caused among LBW newborns (7). According to the Ethiopian Mini Demographic Health Survey (EDHS) 2019 report, the neonatal mortality rate was 33 deaths per 1000 live births (8).

In low-income settings, half of the babies born at or below 32 weeks die due to a lack of feasible, cost-effective care such as warmth, breastfeeding support and basic care for infections and breathing difficulties (7). In high-income countries, almost all of these babies survive. Currently, the World Health Organization (WHO) recommends different interventions for preterm prevention and care, with KMC being one crucial intervention (9). Kangaroo Mother Care is the early, prolonged (8-24hrs), continuous skin-to-skin contact between the mother (or substitute) and her LBW and or preterm baby or babies, at hospital, health center and in the community, with support for correct positioning and exclusive breastfeeding (10). KMC encompasses several components, such as immediate, uninterrupted, and extended skin-to-skin interaction between the neonate and the mother, exclusive breastfeeding, early discharge from healthcare facilities, and specific monitoring in a home setting. Studies have demonstrated its efficacy in mitigating

morbidity arising from complications in preterm births. Moreover, it has been found to decrease mortality rates among preterm or low-birth-weight infants (11,12), foster breastfeeding practices (13), strengthen the bond between mother and infant, and exert a favorable influence on the physical and psychological development of the infant (14). Compared to conventional care, KMC has been shown to reduce mortality of clinically stable low-birthweight infants by approximately 40%, nosocomial infection/ sepsis by 55% and hypothermia by 66% (15). Additionally starting KMC immediately after birth, compared to initiating KMC after the babies are stabilized, reduces neonatal deaths by 25 % (16).

However, the global KMC rate has remained low, with coverage being less than 5% in 2021 (17), and efforts to increase implementation have been largely unsuccessful, This emphasizes the necessity of comprehending the barriers and enablers for the adoption of effective immediate KMC. In Ethiopia, despite the policy emphasis on expanding KMC, the percentage of preterm/low birthweight (LBW) neonates introduced to KMC remains low. Studies indicate that prior to 2021, less than 10% of eligible newborns received any form of KMC, irrespective of its quality (18,19). The national target, as outlined in the newborn and child survival and development strategy, aims to achieve a KMC coverage rate of 70% for preterm babies by the year 2025(20). This study aimed to determine the coverage of EeKMC initiation within 24 hours of birth among low-birth-weight neonates in selected hospitals in Oromia, Ethiopia, using a secondary data. Additionally, it seeks to explore the factors associated with EeKMC and to identify barriers and facilitators influencing EeKMC update.

1.2. Statement of the problem

The survival and well-being of preterm and low birth weight neonates present significant challenges in healthcare, especially in resource-constrained settings. In Ethiopia, neonatal morbidity and mortality resulting from complications of preterm birth and low birth weight constitute a formidable health problem. Addressing this issue is a critical challenge for the health system in its pursuit of improving overall child health. Studies have consistently shown that immediate KMC significantly reduces mortality rates among preterm and low birth weight infants (9,12,15,16,21,22).

In Ethiopia, the uptake KMC for preterm and LBW neonates remains low (18,19). If effective KMC utilization continues to be low and KMC is not scaled up, it is reasonable to expect that

mortality rates among preterm and low birth weight infants could persist at higher-than-optimal levels. This critical gap raises concerns about the well-being and survival of the vulnerable neonatal population, as KMC has been proven to be a life-saving intervention with substantial positive impacts on mortality rates and overall health outcomes.

The persistently low rate of effective early KMC initiation stresses the need for a comprehensive understanding of the factors contributing to this deficiency and the identification of barriers and facilitators influencing the adoption of KMC practices in the Ethiopian healthcare context. The duration and time of initiation of KMC after birth determine the benefits the newborns receive from the intervention. Studies have reported various KMC initiation times, ranging from within a few minutes after birth to several days after birth. Late initiation means that preterm/LBW infants have already lost the benefits of KMC during the period of maximum risk for their health.

Currently, the WHO has revised its recommendation to initiate effective KMC immediately after birth, as starting early has been proven to be more effective than starting it only after the baby is stabilized. Ethiopia has also endorsed the revised recommendations (9,23).

The landscape of EeKMC for preterm and LBW neonates is marked by limited empirical studies addressing both the prevalence of and the barriers and facilitators influencing EeKMC. The scarcity of research on this critical aspect of neonatal care hinders a comprehensive understanding of the factors contributing to the low rates of KMC initiation within the crucial first hours of birth. Consequently, despite studies on barriers and enablers of conventional KMC (24,25), there are limited studies assessing barriers and facilitators EeKMC. The absence of a nuanced exploration of the barriers and facilitators specific to this context hampers the coverage of this evidence-based intervention. Addressing this issue is imperative to inform targeted interventions, policies, and strategies that can significantly enhance the coverage and effectiveness of early KMC, ultimately improving the outcomes of preterm and LBW neonates in the country.

1.3. Significance of the Study

One of the primary purposes of various health programs is the reduction of newborn morbidity and mortality, prompting the implementation of multiple interventions towards this end. In Ethiopia, the government and Ministry of Health are dedicated to lowering newborn mortality rates through the promotion of KMC and other interventions that target key drivers of mortality

among this vulnerable population. This study's findings will provide the Ministry of Health and policymakers with evidence-based insights crucial for informed decision-making in neonatal care policy formulation. The implications extend to healthcare practice, implementation, and stakeholders within the health system, offering practical guidance for health bureaus, facilities, and healthcare providers. Identification of specific factors influencing the successful implementation of KMC for low-birth-weight neonates is pivotal in tailoring effective strategies for timely initiation, thereby enhancing overall neonatal care practices. The study's recommendations can inform policy, guide targeted interventions, and improve the delivery of care, contributing to a more comprehensive and impactful approach to neonatal health in the country.

Furthermore, this research addresses existing knowledge gaps in the field of neonatal care. By investigating the factors influencing the successful implementation of KMC in the context of low-birth-weight neonates, the study contributes valuable empirical evidence to the scientific community. Researchers can build upon these findings to deepen the understanding of effective neonatal care strategies, fostering a more nuanced comprehension of KMC initiation, particularly in resource-constrained settings. Notably, the study examines specific hospitals in the Oromia Region, providing context-specific insights that can guide future investigations and interventions. As a result, this research not only expands the scientific understanding of neonatal care but also lays the groundwork for subsequent studies, creating a pathway for continued advancements in evidence-based healthcare practices. The significance of this study extends to the imminent scaling up of effective immediate KMC, an evidence-based intervention proven successful in reducing morbidity and mortality from prematurity and low birth weight.

2. LITERATURE REVIEW

2.1. Kangaroo Mother Care in Ethiopia: Challenges and Opportunities

Kangaroo Mother Care (KMC) has emerged as a globally recognized and evidence-based intervention for the care of preterm and low-birth-weight neonates. Early KMC is KMC initiated within 24 hours after birth, while effective early KMC is early KMC initiated within 24 hours of birth and the skin to skin contact is greater than or equal to eight hours per day. While numerous studies and program implementations have highlighted its benefits, the application of KMC in Ethiopia faces challenges that impact its effectiveness and implementation. Numerous hospital-based studies have compared incubator care with KMC, in both developing and developed countries. Notably, the majority of studies found that KMC was more cost-effective than incubator care for stable newborns in maintaining appropriate thermal care, lowering nosocomial infections, promoting exclusive breastfeeding and weight gain, and encouraging greater maternal and family involvement in care (26).

In Ethiopia, even though several studies concluded that KMC is an evidence-based and essential care option for preterm and low-birth-weight neonates, there are still poor KMC provision practices. One study that evaluated the quality of KMC services given to LBW babies in terms of infrastructure, processes, and outcomes (survival status at discharge) using data from the 2016 national Emergency Obstetric and Newborn Care (EmONC) assessment found poor infrastructure, low KMC initiation (only 46.4% of eligible LBW babies received KMC), and poor survival among those who received KMC (only 67% were alive at discharge) (27).

2.2. Immediate KMC

WHO recently defined "immediate KMC" as care for premature and low birthweight babies that includes skin-to-skin contact and exclusive breastfeeding that begins as soon as possible after birth and significantly improves the chances of survival for a premature or low birthweight baby. (16).

Currently, immediate KMC is recognized as an effective evidence-based intervention with a positive overall impact on infant mortality and survival of low-birth-weight babies. Based on this

data, the WHO has recently changed its recommendations for KMC and now advises prompt KMC for all preterm or LBW infants, unless they are extremely ill.

The WHO led multi-country randomized controlled trial study found that starting KMC as soon as possible after birth, compare to conventional KMC which is initiated only after the babies are clinically stabilized, significantly reduces morbidity and death (by 25%), particularly in newborns weighing between 1 kg and 1.79 kg (28).

Applying immediate KMC requires the development of appropriate strategies, budget allocation and clear and coordinated planning at different levels of the health system (29). There has been a significant change in the coverage of immediate kangaroo mother care, which is presently being increased in several countries.

One study in Ethiopia revealed 68.1% combined effective coverage of KMC within the 24 hours before discharge following the implementation of conventional KMC (19). The health of LBW babies may ultimately benefit from the expansion of KMC services in all hospitals where deliveries take place. According to Lawn et al. (2010), "if KMC were to acquire high coverage through adoption at lower levels of the health system, the one million neonatal fatalities related to preterm birth that occur annually around the world may be substantially reduced."(12).

2.3. Impact of effective early KMC on the survival of low-birth-weight neonates

There are a number of potential processes by which KMC initiated immediately after birth is beneficial. Early KMC increases the chances that the infant will obtain early breastfeeding and become colonized by the mother's protective microbiome. Additionally, fewer people are handling the baby, which lowers the risk of infection. There is evidence that KMC, when compared to conventional 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. WHO-coordinated multi-country randomized controlled trial in five countries showed that compared to kangaroo mother care started after stabilization, the start of continuous kangaroo mother care soon after birth in children with a birth weight between 1.0 to 1.799 kg increased neonatal survival by 25% (12,30). The research findings indicate that the KMC method implementation has the potential to increase weight gain to 30 g/day with a length ≥4 hours/day for at least 2 hours / periods KMC, possibly amounting to 3.5 times more than the KMC <4 hours/day, CI 95%. (1.2-9.8) (31).

According to studies, KMC improves physiological circumstances, lowers infant crying, and stabilizes the cardiac and vascular status of newborns (32). In addition, KMC is associated with higher coverage of exclusive breastfeeding. In one study, 157 mothers (62.5%) used the KMC group, as opposed to 94 mothers (37.5%) who used the conventional method of care (CMC group). There were 98 (62.5%) exclusively breast-fed babies in the KMC group at the time of hospital discharge compared to 34 (37.5%) in the CMC group, with a P value of .00. This showed that KMC had increased exclusive breastfeeding by 4.1 times (33).

2.4. Enablers and barriers of early KMC

Despite the fact that KMC provides a number of benefits, adoption and implementation have been relatively low at the national level, and only a very small portion of neonates who would benefit from KMC actually receive it. The requirement for close coordination between the obstetrics and neonatal departments, the involvement of numerous stakeholders, the construction of Mother-NICUs, and changes in policy that would permit surrogates to provide care for kangaroo mothers are obstacles to scaling up the intervention (30).

One systematic review looked at the health systems level barriers and facilitators to KMC practice. Based on health workers' experiences and the perspectives of mothers and their families, it found the following as barriers to KMC: inadequate space, insufficient staffing, insufficient guidelines and policies, and insufficient supportive supervision. At the level of health workers, concerns such as workload burdens, knowledge gaps, and staff attitudes were addressed. The lack of support for mothers and their families was also noted (34). The findings from report on an international workshop on KMC identified pain/fatigue during KMC and difficulty of adhering to the kangaroo position while sleeping were the barriers to practice KMC (35). In addition, one study discovered that the presence of surgical procedures during delivery, as well as surgical site pain, prevents mothers from providing adequate KMC (24). Antenatal and postnatal care are the favorable conditions for the implementation of KMC at health facilities (25). The study highlighted the enabling factors for practicing KMC as being family support, encouragement, and motivation. The mothers' willingness to participate and acceptance of KMC make it simple for the nurse to put it into practice. Additionally, mothers were able to practice KMC in the calm, private KMC room without being disturbed or exposed to other mothers or medical personnel (24).

2.4. Conceptual framework

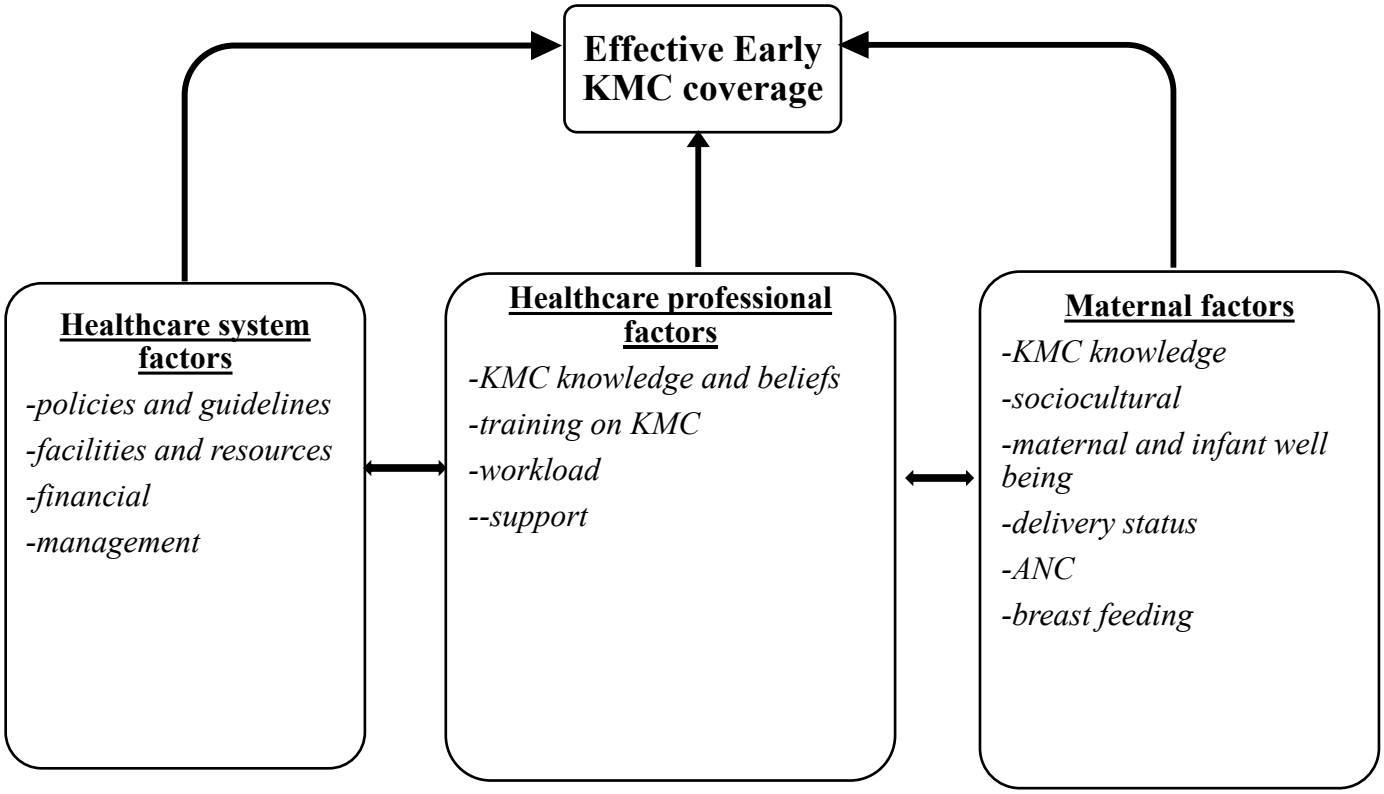

Figure-1: The adapted conceptual framework. Adapted from narrative review conducted on the uptake of Kangaroo Mother Care in neonatal units and other prospective literatures (36).

3. OBJECTIVES

3.1. General objective

- To determine EeKMC coverage and associated factors among <2,000g newborns in selected hospitals in Oromia region, Ethiopia, 2023.

3.2. Specific objectives

- To determine the EeKMC coverage among <2,000g neonates in selected hospitals in Oromia.
- To identify factors associated with EeKMC utilization among <2,000g neonates in selected hospitals in Oromia.
- To explore facilitators and barriers of EeKMC initiation among <2,000g neonates in selected hospitals in Oromia.

4. METHODS

4.1. Study setting and period

This study took place in the Oromia regional state, one of the regional states in Ethiopia. Oromia is the largest regional state in Ethiopia, covering an area of 320,000 square kilometers and hosting an estimated population of 40 million. Currently, the region has 104 hospitals, 1405 health centers, and 7090 health posts. All primary and general hospitals provide delivery and Neonatal Intensive Care Unit (NICU) services. The KMC implementation research was conducted in five hospitals from March 2017 to March 2019 in Oromia, the hospitals include Asella Referral and Teaching Hospital, Kersa Hospital, Bekoji Hospital, Tirunesh Bejing Hospital and Batu General Hospital. The qualitative assessment took place at Asella Referral and Teaching Hospital and Batu General Hospital, the same facilities where the KMC implementation research was carried out. The study was conducted over a one-year period from October 2022 to November 2023.

4.2. Study design

An institution-based cross-sectional study design with mixed method was used to conduct this study. The qualitative study used observation and in-depth interview techniques.

4.3. Population- for quantitative study

4.3.1. Source of population

The source population encompassed all low-birth-weight (<2000grams) neonates within the Oromia region.

4.3.2. Study population

The study population comprised all low-birth-weight neonates (<2000grams) either born in or referred to the specifically chosen hospitals within the Oromia region.

4.3.3. Inclusion criteria

All live-born neonates born in or referred to the selected hospitals, with a birth weight of less than 2,000 g, were included, irrespective of gestational age, type of delivery, or singleton or twin status.

4.3.4. Exclusion criteria

For the quantitative study, infants who died or were referred outside the study district within 24 hours of birth were excluded.

For the qualitative study, mothers younger than 15 years of age or those unable or unwilling to provide consent were excluded.

4.4. Sample size calculation and sampling procedure

The required sample size for study participants was determined using the single population proportion formula. The computation incorporated the assumption that the prevalence of effective Kangaroo Mother Care (KMC) coverage within 24 hours of birth among low birth weight neonates (p) is 3.31%, based on data from a 2021 WHO Randomized Controlled Trial (RCT) on Immediate Kangaroo Mother Care and Survival of Infants with Low Birth Weight. We assumed that half (50%) of the 6.62% immediate KMC rate of the control group was effective (30). The calculation was conducted with a 95% confidence interval, a marginal error (d) of 3%, and factored in a non-response rate of 10%.

$$n = \frac{Z(\alpha/2)^2 \times p(1-P)}{d^2}$$

$$n = \frac{(1.96)^2 \times 0.0331 \times 0.9669)}{(0.03)^2}$$

$$n = \mathbf{137}$$

Non response rate= 10%,

$$137/ (1\text{-}0.10) = 137/0.90$$

$$= 152.22 \approx \mathbf{153}$$

Sample size calculation for the second objective

Epi Info version 7.2.3 was employed to calculate the sample size for the second objective using the double population proportions formula. The assumptions included a 95% confidence interval (CI), 80% power, 10% non-response and half of the proportions were as

got effective early KMC. The proportion were taken from a study in Yirgalem Town, Ethiopia (37).

$$n = \frac{(Z_{\alpha/2}+Z_{\beta})^2 \times (P_1(1-P_1)+P_2(1-P_2))}{(P_1-P_2)^2}$$

Table 1: The sample size calculated using factors associated with KMC

Case-control design (calculated from column total)		
Mode of delivery	**Cases**	**Control**
Exposed: Vaginal	86 (95.6)	104 (83.2)
Unexposed: CS	4 (4.4)	21 (16.8)
Total	90 (100)	125 (100)
Sample size		
Place of delivery		
Government hospital: exposed	71 (80.7)	59 (57.8)
HC: Unexposed	17 (19.3)	43 (42.2)
Total	88 (100)	102 (100)

The sample size determined for the primary objective is 153 and for the secondary objectives is 88 and 102. However, to enhance precision, reliability, and statistical power, I included all eligible LBW cases from the given dataset, which consists of **713** variables. The dataset is the data collected during an implementation research study designed to test KMC scale-up implementation research conducted in selected hospitals of Oromia regional state from March 2017 to March 2019 (38) and the analysis is based on this secondary data.

For the **qualitative study**, a convenience sampling strategy was employed to select participants based on their availability. Fourteen participants were included in in-depth interviews (IDI). The interviews continued until data saturation was reached, indicating no emergence of new information or themes from additional interviews. Eligible mothers of babies receiving KMC during the study period and healthcare providers working at the Neonatal Intensive Care Unit (NICU) were approached for interviews, and those agreeing to participate provided informed consent. The interviews were conducted in Amharic and Oromo and were audio-recorded until information saturation was achieved.

4.5. Study Variables

The dependent variable for the quantitative study was the EeKMC coverage for low-birth-weight neonates within 24 hours of their birth. The qualitative study focused on exploring enablers and barriers to effective early KMC coverage.

The independent variables included factors related to: -

- Maternal characteristics (Age, Marital status, religion, educational qualification)
- Socioeconomic status (Occupational status (employment), Average monthly income and Residence)
- Delivery-related factors (mode of delivery, attendant of delivery, place of delivery, number of living children,
- KMC knowledge and beliefs,
- Healthcare facility resources, and
- Support (family support, HCP support).

4.6. Operational Definitions

Effective Early KMC coverages: The proportion of Low Birth Weight (<2000grams) infants who initiated KMC defined as skin-to-skin contact for at least 8 hours combined with exclusive breastfeeding in the first 24 hours after birth.

4.7. Method and tools of data collection

For the quantitative study, we used secondary data. The data were collected by research assistants with a background in health sciences, operating within hospitals for data collection purposes. The data were collected electronically on tablets using the RedCAP software. For additional details regarding methods and tools, a further description is provided in the paper (38).

For qualitative study: A semi-structured, in-depth interview was conducted with mothers of preterm or low-birth-weight (LBW) infants in the KMC unit, as well as healthcare staff working at the NICU. Open-ended questionnaires were developed, incorporating potential probes to achieve the study objectives based on various reviews that have been conducted and tested. The data collection method included one-to-one in-depth interviews and observation. In addition to taking notes, a recorder was used with the consent of the participants.

4.8. Data management and analysis

The quantitative secondary data were examined for accuracy, outliers, missing values/completeness, timeliness and relevance. The analysis was performed using StataMP 17. Descriptive data were presented using tables and figures. Bivariate analysis was conducted to determine the relationship between each independent variable and EeKMC. Variables with a p-value of less than 0.2 were then entered into the multivariate logistic regression model for the final analysis. Odds ratios with 95% CI were used to measure the strength of the association between dependent and independent variables, and the level of significance was declared at a p-value of < .05.

For **qualitative data**, the field notes and transcripts of each qualitative interview were reviewed, then the data coded manually using color coding, and employed thematic analysis for data analysis. All interviews had their audio recordings verbatim transcribed in Microsoft Word and then translated into English. Thorough interview diaries and field notes were regularly reviewed throughout the data gathering process. To identify common themes, interview transcripts were arranged and evaluated. These themes were continuously examined during the interview sessions. The transcripts were read numerous times following the thematic analysis method to familiarize myself with the information and create preliminary codes of interest. Subsequently, these codes were organized into major groups and subcategories for presentation.

4.9. Data quality assurance

The provided data underwent evaluation based on specific criteria, including accuracy and completeness, relevance and timeliness, validity and reliability of the data collection method, and the credibility of the data provider. Quality control measures were implemented throughout the data collection process.

For the **qualitative study**, an objective-based, standardized questionnaire was developed prior to data collection. To ensure the quality of data derived from the questionnaire and checklist, a pre-testing was conducted involving two mothers and healthcare professionals (HCPs). The questionnaire, initially prepared in English, was translated into Afaan Oromo, the local language, and subsequently back-translated into English to maintain questionnaire consistency. To ensure the applicability or transferability of the study, data collection continued until saturation was reached, accompanied by a thick description of the data.

4.10. Ethical consideration

The proposal underwent review and received approval from the Institutional Review Board (IRB) of the College of Health Sciences at Addis Ababa University. Additionally, permission to access and utilize the secondary data was obtained from the relevant authorities.

For the qualitative study, informed verbal consent was secured from all individual study participants. Confidentiality of the participants' data was guaranteed, and the data was anonymized.

5. RESULTS

The results of this study are presented under two categories: Quantitative Analysis Findings and Qualitative Analysis Findings.

5.1. Quantitative Analysis findings

5.1.1. Introduction to the Quantitative Findings

This section presents a quantitative analysis of EeKMC coverage, factors associated with EeKMC coverage, and reasons mentioned for not initiating skin-to-skin care (SSC).

5.1.2. Sociodemographic and obstetric characteristics of the study subjects

From a total of 727 data of mothers with low-birth-weight infants who were recruited between March 2017 to March 2019, 713 (98%) met the inclusion criteria for EeKMC and were included in the analysis.

The maternal age distribution showed, with a large proportion of them falling between 25-29 years (36.6%) followed by 20-24 years old mothers (28.9%). The marital status of the participants revealed that most mothers were married (96.5%). The educational background varied, with 43.1% having completed primary education, 28.9% secondary education, and 22.6% having no education. The mean number of living children of the mothers was 2.35 with 553(77.6%) of them having 1-3 children. Most of the deliveries of the observed neonates took place in a health facility (92.8%) and conducted vaginally (85.8%). After delivery most of the mothers (95.8%) were stable.

The gender distribution of the new-borns was comparable, with 48.0% females and 52.0% males. Birth weight data revealed that 25.7% infants had very low birth weights (VLBW) of less than 1,500 grams. The number of multiple births included a majority of single births (62.7%), followed by twins (27.9%), and triplets (2.1%).

Table 2: Basic Sociodemographic and Obstetric Characteristics of the Study Subjects in Selected Hospitals in Oromia, Ethiopia, April 2018 to March 2019.

Maternal characteristics	(N=713)	%
Age		
<15	1	0.1
15-19	39	5.5
20-24	206	28.9
25-29	261	36.6
30-34	136	19.1
≥35	66	9.3
Missing	4	0.6
Marital status		
Single	19	2.7
Married	688	96.5
Divorced	3	0.4
Widowed	2	0.3
Missing	1	0.1
Religion		
Orthodox	380	53.3
Muslim	284	39.8
Protestant	45	6.3
Catholic	1	0.1
Missing	3	0.4
School attainment		
No Education	161	22.6
Primary Completed	307	43.1
Secondary Completed	206	28.9
Post-Secondary	38	5.3
Unknown	1	0.1
Occupation		
Professional/technical/managerial	42	5.9
Sales and services	36	5.0
Skilled manual	46	6.5
Unskilled manual	26	3.6
Agriculture	75	10.5
Other	488	68.4
Household Income (ETB), per year		
< 5,000	38	5.3
5,000 – 20,000	204	28.6
20,000 – 50,000	304	42.6
>= 50,000	167	23.4
No. Living children		
0	10	1.4
1-3	553	77.6
4-6	150	21.0

Location		
In catchment	403	56.5
Out of catchment	282	39.6
Missing	28	3.9
Place of delivery		
Health facility	662	92.8
Home	35	4.9
Missing	16	2.2
Delivery mode		
Vaginal	612	85.8
C/S	100	14.0
Missing	1	0.1
Maternal status after delivery		
Stable	683	95.8
Unstable	22	3.1
Missing	8	1.1
New-born characteristics		
Sex		
Female	342	48.0
Male	371	52.0
Birth weight		
LBW <2,000 grams	515	72.2
VLBW <1,500 grams	183	25.7
ELBW <1,000 grams	15	2.1
Multiple births		
Single	447	62.7
Twins	199	27.9
Triplets	15	2.1
Missing	52	7.3

5.1.3. Effective early KMC coverage

Among 713 eligible neonates for KMC within 24 hours of birth, EeKMC coverage was 4.6% (33/713), while the coverage of any skin-to-skin care within 24 hours was 18% (129/713), and exclusive breastmilk feeding stood at 55.5% (396/713) *(Figure 2).*

Out of the 129 newborns who received any skin-to-skin care, the majority 77/129 (59.7%) received the care between 12 to 24 hours after birth, while only 8/713 (6.2%) had the experience within the first 2 hours after birth.

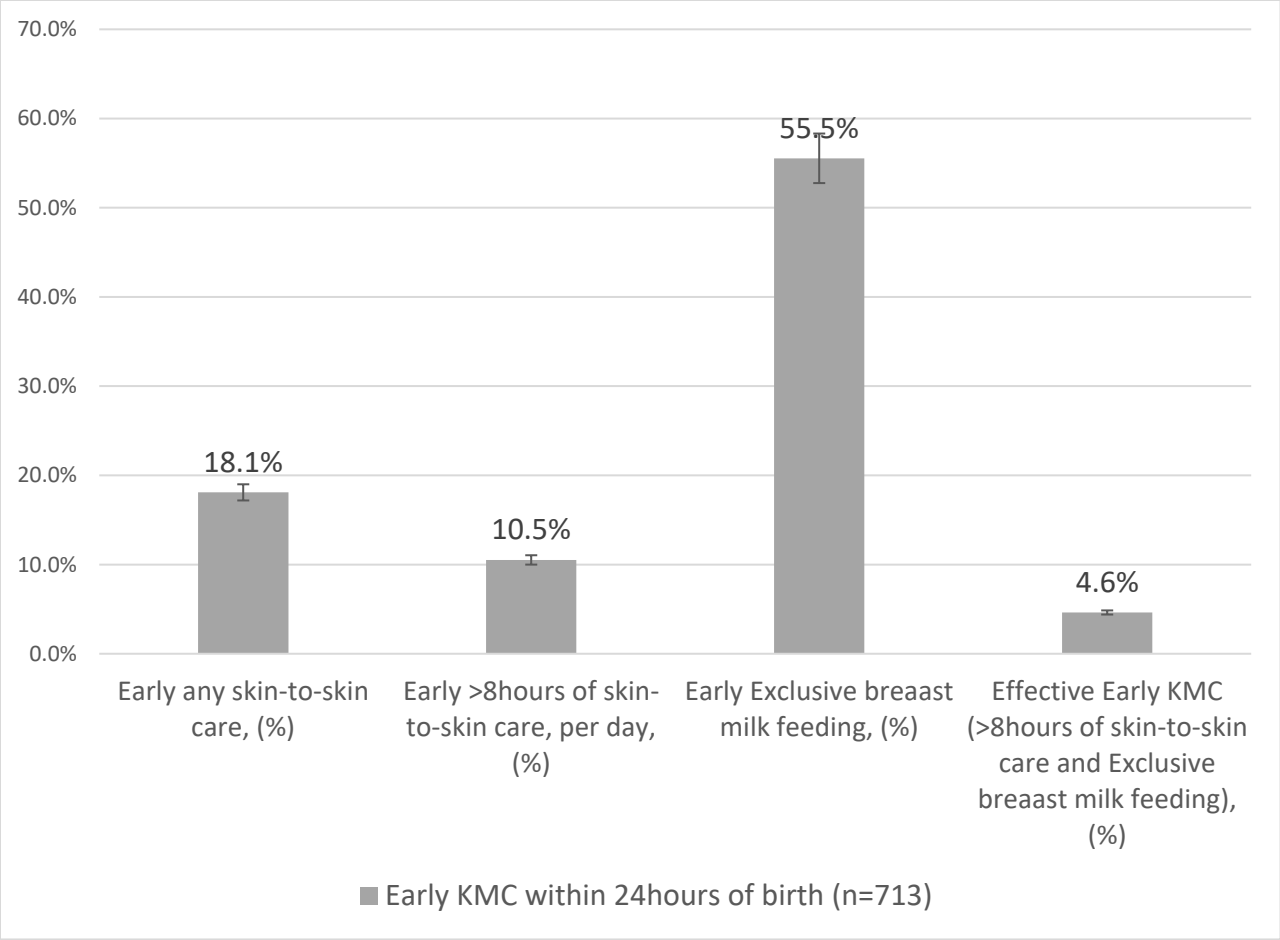

Figure 2: Effective early KMC coverage in Selected Hospitals in Oromia, Ethiopia, April 2018 to March 2019.

5.1.4. Factors associated with effective early KMC

We ran bivariate logistic regression to assess the association between independent variables and the EeKMC.

In bivariate logistic regression, factors including maternal age, household income, birth weight, multiple births, and the presence of the baby in an incubator demonstrated significant associations with EeKMC. Specifically, women aged 20-29 and >=30 were 66% [COR=0.33; 95% CI (0.12-0.93)] and 75% [COR=0.25; 95% CI (0.075-0.84)] less likely to utilize EeKMC compared to the <=19 age group. Mothers following the Muslim religion were 45% [COR=0.55; 95% CI (0.24-1.28)] less likely to receive EeKMC compared to Orthodox followers, while Protestant followers were three times more likely [COR=2.38; 95% CI (0.84-6.7)]. The LBW<2000 grams' group had a four times higher likelihood [COR=3.7; 95% CI (1.12-12.3)] of

EeKMC compared to the reference group (VLBW<1,500 grams). The twins group had a 67% lower likelihood [COR=0.33; 95% CI (0.11-0.96)] of Ee-KMC compared to the reference group (Single).

In multivariate logistic regression, baby being kept in incubator remained significantly associated with EeKMC. Babies in an incubator had a 93% lower likelihood [AOR=0.07; 95% CI (0.015-0.34)] of receiving EeKMC compared to those not in an incubator.

Table 3: Crude and Adjusted odds ratios with 95% confidence intervals for factors associated with effective early KMC in Selected Hospitals in Oromia, Ethiopia, April 2018 to March 2019.

Variable	Effective KMC within 24 hours of birth		COR (95%CI)	AOR (95%CI)
	Yes, (%)	No, (%)		
Age of mother				
<=19	5 (12.50%)	35 (87.50%)	1	1
20-29	21(4.50%)	446(95.50%)	0.33(0.12-0.93)*	0.43(0.11-1.69)
≥30	7(3.47%)	195(96.53%)	0.25(0.075-0.84)*	0.38(0.075-1.87)
Religion of the head of HH				
Orthodox	19(5.00%)	361(95.00%)	1	1
Muslim	8(2.82%)	276(97.18%)	0.55(0.24-1.28)	0.39(0.14-1.05)
Protestant	5(11.11%)	40(88.89%)	2.38(0.84-6.7)	2.11(0.55-8.10)
Household Income (ETB), per year				
"Low Income" < 5000	5(13.16%)	333(86.84%)	4.9(1.3-17.9)*	3.88(0.92-16.38)
"Moderate Income" 5,000 – 20,000	13(6.37%)	191(93.63%)	2.2(0.77-6.32)	2.99(0.86-10.4)
"Middle income" 20,000 – 50,000	10(3.29%)	294(96.71%)	1.10(0.37-3.28)	1.06(0.3-3.79)
"High income" >= 50,000	5(2.99%)	162(97.01%)	1	1
Where health facility did she give birth?				
Within catchment	30(4.89%)	583(95.11%)	1	1

Out of catchment	2(4.08%)	47(95.92%)	0.83(0.19-3.57)	0.88(0.16-4.93)
Maternal status after delivery				
Stable	32(4.69%)	651(95.31%)	1	1
Unstable	1(4.55%)	21(95.45%)	0.97(0.13-7.43)	5.26(0.5-55.10)
Birth weight				
LBW<2000 grams	30(5.83%)	485(94.17%)	3.7(1.12-12.3)*	2.83(0.75-10.64)
VLBW<1,500 grams	3(1.64%)	180(98.36%)	1	1
Multiple births				
Single	26(5.82%)	421(94.18%)	1	1
Twins	5(2.01%)	195(97.99%)	0.33(0.11-0.96)*	0.35(0.11-1.18)
Birth order				
1	21(5.53%)	359(94.47%)	1.56(0.76-3.23)	0.90(0.35-2.3)
>1	12(3.60%)	321(96.40%)	1	1
Baby in incubator				
Yes	2(0.57%)	349(99.43%)	0.059(0.014-0.25)*	0.07(0.015-0.34)*
No	31(8.81%)	321(91.19)	1	1

Adjusted for all variables in the model, 1-references

COR – Crude odds Ratio, AOR – Adjusted Odds Ratio, CI: confidence interval. * P- Value <0.05,

Fitted model = 1.0000

Note, there are categories of predictor variables excluded from the regression model due to zero observations, despite being significantly associated with EeKMC in several articles. These variables include the mode of delivery (c/s), place of delivery (home), newborn status after delivery (unstable). Excluding these variables is crucial to prevent overfitting of the model and ensures reliable estimates of the coefficients.

5.2. Qualitative analysis findings

5.2.1. Introduction to the Qualitative Findings

This section presents a qualitative analysis of the barriers and facilitators related to effective early KMC initiation and exclusive breastfeeding practices among mother of preterm babies in two selected hospitals (Batu General Hospital and Asella referral and teaching Hospital) in the Oromia region. The analysis is based on in-depth interviews (IDIs) conducted with mothers of preterm and low birth weight babies, healthcare professionals, including NICU head, NICU provider, doctor at neonatal care, and pediatricians, as well as observations within the hospitals settings.

5.2.2. Sociodemographic characteristics of respondents

In this study, six mothers and eight healthcare providers, comprising two pediatricians, two NICU heads, two doctors in neonatal care, and two NICU providers were included. The majority of the mothers were aged 26-30 and resided in rural areas. In terms of educational status, most of the mothers had attended primary school. Among the healthcare providers, three out of eight were male. Additionally, four of the included healthcare providers had more than two years of experiences at the facility.

5.2.3. Participants perspective toward initiating KMC early

All respondents, both mothers of preterm infants and healthcare providers, share the belief that KMC offers health benefits for both the baby and the mother and should be initiated promptly after birth.

A healthcare provider expressed, *"It should commence within 24 hours after birth, but various factors can influence this." (ID05, pediatrician)*.

Some mothers believe that early close contact with their babies and breastfeeding helps the baby become familiar with their mother.

One mother expressed, *"They should let the mother be with her baby after birth because holding the baby and breathing into the baby after birth helps the baby get to know his mother and become strong." (ID04, mother)*.

5.2.4. Barriers and Facilitators of Early KMC

Participants acknowledge the importance of early KMC initiation but reported delays in its initiation after birth. Primary factors influencing timely KMC initiation and ongoing practice, as frequently cited, include maternal and infant factors, healthcare system and professional considerations, religious and cultural beliefs, and socioeconomic influences.

One healthcare provider explained, *"There are conditions where they start early, and there are conditions where they do not. For example, most women come here with referrals from health centers due to different complications. Regarding medical factors, first, we treat the case for both the baby and the mother. Even premature babies are referred here if they are in unstable conditions. They are not referred to us solely because they are preterm or to start KMC. However, if they are born here, they can start within 24 hours." (IDI07, General Practitioner)*

Healthcare System Factors:

Healthcare System Factors pertain to various aspects of healthcare infrastructure affecting KMC. Commonly cited issues by both mothers and healthcare providers include challenges related to KMC facilities, room conditions, and beds. Healthcare providers noted KMC underutilization due to limited room availability. They also noted issues like a lack of separate rooms for unstable infants. Mothers emphasized bed shortages, describing existing KMC beds as uncomfortable and unsuitable for holding newborns and breastfeeding.

One mother mentioned the bed shortage, stating, *"I want to mention the shortage of beds; they kept me here due to a lack of beds. Even now, all beds are occupied, and if another mother comes, there's no bed." (IDI03, mother).*

During our observation, we observed that the KMC beds were insufficient relative to the number of mothers, and the KMC room was inadequately lit and uncomfortable for mothers.

A mother described the KMC room as inadequate, saying, *"Most of the time, the KMC room window is left open, there is airflow in the room, and the room quality is poor. People, like family and relatives, enter and exit as they please." (IDI02, mother).*

Additional healthcare system factors impeding early KMC initiation include a lack of educational materials, manuals, and KMC guidelines. Several healthcare providers pointed out that KMC is not part of the newborn referral process.

As one provider stated, *"Even premature babies in unstable conditions are referred here, not specifically for being preterm or for KMC initiation." (IDI07, General Practitioner)*

During observation, we found a lack of specific protocols or guidelines for identifying preterm/low birth weight babies and for KMC practices. Additionally, there was a shortage of clear visual teaching materials in the KMC room.

A Neonatal Care Unit (NCU) head noted that the inefficient transfer of babies from the delivery room to the Neonatal Intensive Care Unit (NICU) hinders the prompt initiation of KMC.

The NCU head explained, *"Even within the hospital, challenges arise when transporting babies to our NICU. They often arrive hypothermic, inadequately dressed in just a few clothes provided by their families. Sometimes, babies are sent wrapped in just cotton." (IDI06, NICU Head)*

Early KMC was facilitated within the healthcare system through a combination of factors, including quality improvement initiatives, the utilization of visual aids such as television programs and posters, and the implementation of supportive policies. Enhanced care quality and the timely initiation of KMC were achieved through quality improvement measures in healthcare facilities. Visual aids, such as television programs and posters, were employed to educate both healthcare providers and mothers, resulting in increased awareness and understanding of KMC. Furthermore, early KMC was promoted, and the availability of essential infrastructure and resources for its successful implementation was ensured by supportive hospital policies.

Healthcare Professional Factors:

Healthcare Professional Factors encompassed healthcare professionals' knowledge of KMC guidelines, their willingness to promote and support KMC, their communication skills in educating and encouraging mothers, and their practical skills in assisting with KMC initiation.

Healthcare professional factors revealed that the lack of training and skill gaps among healthcare professionals had emerged as a significant obstacle. This had hindered their ability to confidently and competently initiate KMC, resulting in delays and suboptimal practices. Additionally, low

motivation and incentives, particularly in the form of low salaries, had contributed to these challenges. The financial constraints faced by healthcare professionals not only demotivated them but also had an adverse effect on their commitment to KMC. Another critical issue was the shortage of healthcare professionals, which had led to overburdened staff and reduced attention to KMC. This scarcity had further exacerbated the situation by limiting the availability of dedicated personnel for KMC initiation. Moreover, the low attention given by healthcare professionals to KMC had been influenced by negative attitudes. These negative perceptions had often arisen from misconceptions and a lack of awareness, thereby hindering the promotion and timely initiation of KMC.

During observation, we observed that infection control measures were not effectively followed during KMC practice.

Healthcare professional facilitating factors for the early initiation of KMC included the prominent encouragement of family involvement, signifying its critical role. Healthcare professionals who actively promoted and facilitated family engagement in the care process played a pivotal role in improving the acceptance and effectiveness of KMC. Moreover, effective counseling and clear communication with parents emerged as another key factor. Healthcare professionals who could articulate the benefits and procedures of KMC in a supportive and comprehensible manner greatly assisted parents in understanding and adhering to KMC practices.

Maternal Factors:

Maternal Factors encompass various aspects related to the mother's knowledge, emotions, and physical condition that may influence the timely initiation of KMC.

Several maternal factors were found to influence the early initiation of KMC. One notably significant factor was the maternal fear of holding and seeing their preterm baby, often driven by feelings of despondency and concerns about the baby's survival. This emotional barrier hindered some mothers from promptly initiating KMC. Additionally, maternal exhaustion and fatigue after delivery, due to the physical demands of childbirth, made mothers less inclined to initiate KMC immediately.

Furthermore, post-operative (C-section) wound pain and discomfort contributed to delays in KMC initiation, as the pain associated with the C-section wound made it challenging for some mothers to hold their babies as recommended for KMC, as expressed by one mother: *"The wound, there is a wound on my abdomen [C-section wound], that makes me painful if I hold the baby like they said..." (IDI03, Mother).*

Many mothers expressed a lack of knowledge about what KMC entails and its benefits, creating a barrier to its prompt initiation. This deficiency in awareness wasn't limited to the mothers alone; it extended to their families as well. Mothers mentioned that they had to be introduced to what KMC is and how it helps their child. As a result, the initial stages of KMC required additional efforts to educate and create understanding about its importance. This lack of awareness among both mothers and their families placed an extra burden on healthcare staff. As one participant noted, *"Specifically, there are not many things that facilitate it because there is a lack of awareness among families. For example, when we start KMC with one mother, we begin by introducing what KMC is and how it helps her child. This lack of awareness on KMC also affects us, and it increases the burden on the staff because they don't know about KMC at all." (IDI07, General practitioner)*

Within the context of maternal factors that influence the early initiation of KMC, two key factors stood out as significant barriers.

One prominent factor was the worry about being away from home. Mothers often expressed concerns about being separated from their home environment, which contributed to emotional distress and hesitation in practicing early KMC.

Another factor, postpartum stress and trauma, played a substantial role. Mothers and their families sometimes experienced immense psychological stress and trauma, fearing that their preterm babies would not survive. In some cases, this resulted in families initially resisting the idea of KMC. The belief that their infants were too small and fragile to survive led some families to run away, leaving their babies at the hospital. However, with effective counseling and as they witnessed improvements in their baby's condition, such as weight gain, families became calmer and more accepting of KMC advice.

As one participant described, *"Psychologically, parents become stressed and traumatized. They think the baby won't survive. Sometimes families run away, leaving their baby at the hospital, thinking the baby cannot survive and live. They ask for attention to be focused solely on the mother, as they think the baby cannot survive due to its small size. Most families think this way and challenge us. However, as we counsel them and see improvements in the baby's condition, such as weight gain, they become calmer and try to accept our advice." (IDI05, pediatrician)*

The rare but unfortunate circumstance of a deceased mother emerged as a significant barrier to the initiation of KMC, as it impeded the mother's active involvement in this essential care practice. Maternal non-compliance, characterized by resistance or reluctance to adopt KMC, presented a notable challenge. Moreover, certain mothers expressed a preference for returning home after childbirth instead of participating in the hospital-based KMC protocol, resulting in further delays in the initiation process. Additionally, some mothers harbored doubts and hesitations about the efficacy and benefits of KMC, indicating a lack of belief in the practice.

The early initiation of KMC was facilitated by several maternal factors, each of which played a unique and vital role. Firstly, the willingness of mothers to engage in KMC was a significant facilitator, with those who expressed a strong desire and readiness being more likely to initiate KMC promptly. Additionally, previous experience with preterm births was found to be a facilitative factor, as mothers with prior experience in caring for preterm babies exhibited greater confidence in KMC, positively affecting their readiness to adopt and effectively practice it. As expressed by one participant, *"Those who have previous experience with preterm births are generally more confident in caring for their babies" (IDI01, NICU provider).*

Furthermore, pregnancy follow-up was identified as another contributing facilitator, with mothers who received regular and attentive follow-up during pregnancy showing a higher inclination to initiate KMC early. Maternal stability after delivery, encompassing emotional and physical well-being, played a pivotal role in facilitating early KMC initiation. Maternal satisfaction with the KMC process and witnessing positive progress in their preterm new-borns' health further motivated early KMC initiation. Lastly, the educational background of mothers was a facilitative factor, with educated mothers often demonstrating a greater inclination to practice KMC and a better understanding of its principles.

Infant factors:

Within the context of infant factors affecting the early initiation of Kangaroo Mother Care (KMC), one prominent element was the occurrence of twin births. Mothers of twins faced unique challenges in initiating KMC promptly. The necessity of holding and breastfeeding two infants simultaneously posed a practical challenge. As one mother of twins described, *"As they are twins, I can't hold both of them simultaneously and breastfeed them. It's my mother who holds one for me until I finish breastfeeding one baby. Also, it's tiring to give such care continuously one by one in order. It's tiring for me." (IDI03, Mother).*

Support:

The pivotal role played by family support, particularly from fathers, in the early initiation of KMC was evident. However, a recurring challenge within this support structure was the refusal and reluctance of fathers to provide KMC assistance. In many instances, fathers did not actively engage in this type of care and displayed resistance to accepting their role in KMC. This reluctance was exemplified in a case involving twins, where a mother grappled with holding both infants successively. Efforts by healthcare providers to involve her husband in providing assistance were met with his refusal, as reported by one participant, *"Regarding family support, on the father's side, most of the time, they don't get involved in such kind of care. They don't accept that. For example, once there were twins, and the mother was struggling to carry both of them successively, and we asked her husband to assist her, but he refused to help" (IDI07, NICU Head).*

Socioeconomic Factors and Religious and Cultural Beliefs:

In the examination of the factors influencing the early initiation of KMC, a landscape emerged where socio-economic conditions and religious and cultural beliefs played a defining role. Economic disparities, were identified as a significant influence, affecting the ability of families facing financial constraints to promptly engage in KMC. The requirement for suitable clothing and adequate support, emerged as a crucial aspect. The absence of these essential resources often contributed to delays in the initiation of KMC.

Participants noted the geographical challenges associated with residing in remote areas or being situated at a substantial distance from healthcare facilities equipped to provide KMC. This

underscored the obstacles encountered by individuals living in such remote locales in accessing timely KMC services.

Cultural Norms That Rush Mothers to Go Home After Birth (Traditional Postpartum Care) revealed how cultural norms often pressured mothers to leave healthcare facilities swiftly to adhere to traditional postpartum care practices. This rush significantly hindered the timely initiation of KMC, as illustrated by a participant who explained, *"But most of the time, they rush to go home after birth because culturally there is 'ሖዳ' (traditional care for postpartum mothers at home). They become reproached after a while, as they don't expect to wait after delivery" (IDI05, paediatrician).*

Additionally, the influence of cultural norms that discouraged fathers from actively participating in newborn care was evident. These norms primarily stemmed from restrictions that forbade males from entering rooms where recent postpartum mothers were located. As one participant elaborated, *"Additionally, culturally, husbands don't enter rooms where recent mothers who have given birth are located. In fact, there's a saying, 'Gola deessu dhiirri hin seentu,' [which means it's not allowed for any males to enter a room where recent postpartum mothers are]" (IDI06, NICU Head).*

5.2.5. Barriers for Early Initiation and Sustained Exclusive Breastfeeding

The barriers to exclusive breastfeeding involve a complex interplay of cultural, medical, and maternal factors.

The risk of Necrotizing Enterocolitis (NEC) was a prevalent concern that led to delays in breastfeeding initiation. A participant expressed this concern, stating, *"Starting breastfeeding too early can expose the baby to risks such as NEC" (IDI01, NICU Provider).*

Maternal concerns about insufficient milk secretion and occasional requests for formula milk added complexity to the practice of exclusive breastfeeding. The challenge of breastfeeding twins highlighted the importance of specialized support for mothers in such situations. One participant conveyed this challenge, explaining, *"As they are twins, I can't hold both of them simultaneously and breastfeed them. It's my mother who holds one for me until I finish breastfeeding one baby. Also, it's tiring to give such care continuously one by one in order. It's tiring for me" (IDI03, Mother).*

Post-operative pain and discomfort arising from a Caesarean section (C-section) wound presented an additional barrier to early breastfeeding initiation. Similarly, the gestational age of infants below 34 weeks influenced the readiness for breastfeeding. The challenges associated with expressing breast milk encompassed discomfort, fear, and maternal refusal, impacting the initiation of exclusive breastfeeding. One participant shared, *"This also challenges us because even if she is able to express breast milk, sometimes it is difficult due to pain and their refusal. Some mothers say it is not natural; the baby should be breastfed. Some mothers refuse due to pain" (IDI05, pediatrician).*

The unique circumstance of a deceased mother was a rare but poignant barrier to the practice of exclusive breastfeeding. Non-compliance emerged as a recurring issue, stemming from a variety of factors. The absence of convenient nasogastric (NG) tubes for premature infants served as a practical challenge to exclusive breastfeeding. Additionally, the lack of materials for expressing breast milk, including breast pumps, underscored the importance of having necessary equipment to promote breastfeeding.

The introduction of substances other than breast milk, such as water or cow's milk, was a significant concern that necessitated interventions to promote exclusive breastfeeding. Participants also alluded to baby stability and family resistance as factors influencing exclusive breastfeeding practices. A participant remarked, *"We recommend exclusive breastfeeding, but yes, families often give other substances. For example, they give cow's milk, especially when the baby shows signs of abdominal irritation and distension. We ask families if they've given other substances, and they often admit to it. Some families even try to hide it" (IDI07, General Practitioner).*

5.2.6. Facilitators for Early Initiation and Sustained Exclusive Breastfeeding

Facilitators to Early Initiation and Sustained Exclusive Breastfeeding were influenced by a range of factors that played a crucial role in promoting and supporting this practice. Healthcare professionals provided essential assistance, guidance, and support to mothers on proper holding and attachment positions during feeding.

Participants emphasized the significance of promoting adequate rest, fluid intake, and a comfortable environment, including a clean bed and mattress, as well as visual aids and teaching materials to facilitate successful breastfeeding. As one participant noted, *"A clean bed and*

mattress contributed to a sense of calmness, making it easier to express breast milk or breastfeed successfully" (IDI01, NICU Provider).

Maternal willingness to initiate breastfeeding as instructed by healthcare workers played a crucial role in the early initiation and sustained practice of exclusive breastfeeding. Additionally, the enforcement of exclusive breastfeeding policies and the presence of educated mothers further contributed to the facilitation of this practice.

6. DISCUSSION

This research aims to assess the extent of EeKMC coverage, identify factors associated with its implementation, explore barriers and facilitators influencing EeKMC, and propose actionable measures and recommendations to enhance the provision of KMC for low birth weight and preterm neonates. The coverage of EeKMC is 4.6%, while exclusive breastfeeding stands at 55.5%. Barriers to EeKMC and early Exclusive Breast Milk Feeding (EBMF) encompass factors such as inadequate healthcare infrastructure, skill gaps, low motivation, negative attitudes among healthcare professionals, maternal emotional barriers, exhaustion, post-operative pain, lack of knowledge about KMC, concerns about leaving home post-birth, and cultural norms that rush mothers to go home after birth. Facilitators included supportive healthcare policies, quality improvement initiatives, visual aids, active promotion of family involvement, effective counseling by healthcare professionals, maternal willingness, previous experience with preterm births, regular pregnancy follow-up, maternal stability, and the presence of educated mothers.

The utilization of EeKMC within 24 hours of birth among low birth weight neonates is notably low, at only 4.6%. This outcome underscores a concerning inadequacy in the implementation of KMC, despite well-documented benefits for the survival and well-being of low-birth-weight neonates. Studies in two regions of Ethiopia reported KMC coverage rates of 14.4% and 10%, respectively, initiated immediately after birth (37,39).These findings closely align with our study, emphasizing the persistent challenges in achieving higher KMC coverage within the critical timeframe across different regions of Ethiopia.

Furthermore, a hospital-based cross-sectional study conducted at Kenyatta National Hospital on modes of thermoregulation revealed that only 7% of infants received KMC (40). Studies in Malawi demonstrated initiation rates for KMC in hospital deliveries ranging from 0.6% to

17.4%, while in Nigeria, early KMC after birth was reported to be less than 10% (41,42). These findings underscore the widespread challenges in promoting early KMC in low-resource settings, extending beyond Ethiopia.

In contrast, in Rwanda, an estimated 75% or more low birth weight newborns are initiated on facility-based KMC, as KMC is integrated into the national protocol (42). An analysis of Demographic and Health Survey (DHS) data from various Low- and Middle-Income Countries (LMICs) found the prevalence of Kangaroo Mother Care ranging from 11.04% to 84.36%, with the highest rates in Benin (84.36%), Tajikistan (80.88%), and Uganda (80.86%), and the lowest in Burundi (11.04%), Bangladesh (16.58%), and Pakistan (19.24%) (43). These variations may be explained by differences in health service uptake, cultural and societal factors, low levels of awareness, and national healthcare policies. And also how KMC was measured can be one reason for the variation

Concerning the quality of KMC, our study identified low effective KMC practices. Similarly, a study in Bangalore, India, revealed that some mothers practiced KMC for shorter durations (5-15 minutes) instead of the recommended hour due to perceived fatigue and stress (44). Another study in Ghana reported less time spent on KMC during both the day and night compared to health facility recommendations (45). These findings suggest practical challenges and variations in adhering to recommended KMC durations influenced by factors such as fatigue, perceived difficulty, and contextual differences between health facility settings. Addressing these challenges is crucial for enhancing the effectiveness and widespread adoption of Kangaroo Mother Care.

In our study, we observed that older women were less likely to initiate effective early Kangaroo Mother Care (KMC) compared to younger women. This discrepancy might be attributed to the possibility that younger women are more informed about the practice, potentially resulting from improved access to health education. It is noteworthy, however, that several studies have reported contrary findings, suggesting that older women tend to utilize KMC more than their younger counterparts (46–50).

The low birth weight group (LBW < 2,500 grams) showed higher likelihood of practicing EeKMC) compared to the reference group with very low birth weight (VLBW < 1,500 grams). This higher prevalence among LBW infants, rather than extremely low birth weight (ELBW)

infants, is expected due to the greater medical fragility of ELBW infants, requiring specialized care that may impede immediate initiation and practice of KMC in the early postnatal period. Numerous studies substantiate this observation (43,51,52).

The likelihood of EeKMC in the twins group was 67% lower when compared to the reference group of singleton births. Notably, a specific study documented that 9.8% of participants encountered challenges in delivering effective KMC, specifically attributing these difficulties to the presence of twins (53).

Keeping infants in incubator is significantly associated with a reduced likelihood of EeKMC. Infants kept in an incubator exhibited a 93% lower likelihood of receiving EeKMC compared to those not placed in an incubator. This suggests that healthcare providers consider incubator as more efficacious in providing to the infants' optimum warmth and care than keeping them in KMC? Despite the advantages of KMC outweighing those of the incubator for eligible newborns, and despite the absence of studies examining the effects of incubator presence on EeKMC in implementing facilities, our study reveals a negative impact of using incubator as substitute to KMC. The predominant reason for the initiation of skin-to-skin care in neonates, specifically the presence of the baby in an incubator, may be attributed to preferences and adherence to the established and experienced practice of using an incubator.

Our study omits certain relevant variables that have been consistently associated with effective early Kangaroo Mother Care (KMC), as indicated by findings in other studies. The exclusion of these variables from our regression model is a result of no observations. For instance, the mode of delivery has been identified as a significant factor, with mothers who undergo vaginal delivery demonstrating a higher likelihood of receiving effective early KMC compared to those undergoing cesarean section or instrumental delivery. This observation aligns with various studies conducted both in Ethiopia and globally. A study in the Tigray region of northern Ethiopia revealed that mothers who had a current spontaneous vaginal delivery were 5.39 times more likely [(AOR=5.39, 95% CI: (2.3, 12.25)] to practice KMC compared to those delivered by forceps (46). Similar findings were reported in a study conducted at Dessie Referral Hospital in Northeast Ethiopia (54). Additionally, multiple studies have consistently indicated that infants delivered by cesarean section have lower odds of receiving KMC compared to those delivered through normal delivery (19,47,48). Despite the World Health Organization's (WHO)

recommendation advocating uninterrupted skin-to-skin contact for healthy mothers and newborns (55), previous research indicates a declining trend in the adoption of this practice.

Another pertinent variable is the location of childbirth, with mothers delivering at health facilities demonstrating a higher likelihood of engaging in early KMC compared to those giving birth at home. Various studies conducted in diverse regions of Ethiopia consistently indicate that mothers who avail themselves of healthcare facilities for childbirth are more inclined to practice KMC than those who opt for home births (27,48,56). This aligns with several analogous studies emphasizing that delivery in a health facility, encompassing both private and public centers, is associated with an increased probability of initiating and practicing KMC (43,57,58).

The analysis of early exclusive breastfeeding (EEBF) coverage within the context of KMC has yielded coverage rate of 55.5%. This particular finding underscores the fundamental role of EEBF within the context of KMC. A review of the extant literature shows a notable consistency in the reported EEBF coverage across diverse studies. For instance, an investigation conducted in Tanzania reported that less than 20% of participants initiated breastfeeding within the initial hour following delivery, yet over half of the neonates had received breast milk within six hours post-delivery, with more than 80% being breastfed within the first 24 hours (59). Similarly, a study carried out in China noted that a substantial portion of mothers practicing KMC exclusively breastfed their infants during the 24 hours preceding their hospital discharge, registering a rate of 54.6% (60). Furthermore, an inquiry conducted in Ghana documented an incidence of exclusive breastfeeding at 54.8% (61). These collective findings indicate a shared thread of understanding among these diverse studies regarding the significance of EEBF within the KMC context. The consistent trend in the reported EEBF coverage rates from various global contexts underlines the paramount importance of promoting early exclusive breastfeeding as an essential component of KMC. Nevertheless, it is imperative to recognize that disparities in coverage rates may emanate from regional and contextual variables. Additionally, it is noteworthy that a systematic review has reported a higher prevalence of EEBF (62%) in infants weighing less than 2500 g (62), signifying potential variations in EEBF practices among distinct neonatal subgroups.

The findings of our qualitative study have elucidated a multifaceted array of factors identified as influential in the effective implementation of Early KMC. These factors can be categorized into distinct domains, encompassing Healthcare System Factors, Healthcare Professional Factors,

Maternal Factors, Infant Factors, Support Mechanisms, Socioeconomic Determinants, as well as Religious and Cultural Beliefs and Practices. This categorization is instrumental in providing a comprehensive understanding of the complex dynamics that impact the successful initiation and sustenance of early KMC practices.

The predominant barriers identified in the healthcare system encompass limited resources (such as KMC beds, teaching aids, and KMC manuals), unfavorable KMC room conditions (including unhygienic settings, issues with temperature control, lack of privacy, and uncomfortable and unsupportive KMC beds), restricted access to KMC facilities, and the absence of KMC inclusion in the referral process. These factors stand out as major challenges hindering the effective implementation of KMC. A comprehensive review study investigating the barriers and facilitators of facility-based KMC in Sub-Saharan Africa revealed that health system and facility-related factors played a central role. Specifically, among the studies analyzed, 70% highlighted barriers within the health system and facility context, while 67% outlined facilitators for initiating KMC within healthcare facilities(34). These findings emphasize the critical importance of addressing healthcare system factors to enhance the timely initiation and utilization of KMC. Consequently, interventions aimed at improving healthcare system and facility-related aspects show promise for advancing KMC practices in the sub-Saharan African context. Additionally, various studies have identified healthcare system factors, including limited resources such as a shortage of KMC beds and insufficient KMC room capacity, as barriers to the early and effective implementation of KMC (25,57,63–66).

According to the 2023 guidelines set forth by the Ethiopian Minister of Health on KMC technical implementation, specific recommendations were outlined. These guidelines suggest that the number of KMC beds or reclining chairs adjacent to each neonatal bed in the Neonatal Intensive Care Unit (NICU) should be 10, 8, and 4 for referral hospitals, general hospitals, and primary hospitals, respectively (23). Our study findings, within the context of these guidelines, highlight the current disparity or inadequacy in the number of KMC beds and spaces available, as identified by our study.

Concerning the effective utilization of KMC, many mothers indicated that an unsuitable KMC environment hindered their continuous practice of KMC. They specifically mentioned challenges related to unhygienic KMC rooms, temperature control issues, lack of privacy, and

uncomfortable and unsupportive KMC beds. Consistent with our findings, a study conducted in Uganda reported that intermittent skin-to-skin care was more prevalent than continuous care in 75% of cases due to inadequate environments (63). Similarly, healthcare providers have identified the absence of temperature control as a barrier to effective Kangaroo Mother Care (KMC) practices. Supporting this, existing studies emphasize that an additional obstacle to KMC is the hot and humid atmosphere, which could be addressed by establishing dedicated KMC rooms. These rooms would not only regulate temperature but also ensure mothers' privacy (53,67).

Our study identified the absence of KMC guidelines, manuals, and service documentation as impediments to the effective implementation of KMC practices. A parallel study conducted in Malawi mentioned similar findings, indicating that the readiness to provide KMC services was significantly constrained by the lack of guidelines, newborn caps/hats, and service documentation (41). It is noteworthy that, as of 2023, Ethiopia did not possess a standardized KMC implementation guideline in place (23).

The primary healthcare system factors impeding the timely initiation of KMC by mothers after birth include delivering at health facilities where KMC is not practiced. In Ethiopia, a majority of lower-level health facilities, such as health centers, lack KMC services. Consequently, if a mother gives birth at these facilities and is subsequently referred, it results in a delay in the early initiation of KMC. Additionally, another study in Ethiopia highlighted the absence of KMC rooms and Neonatal Intensive Care Units (NICUs) in numerous health facilities, acting as barriers to facility-based KMC (25). In a recent KMC implementation guideline in Ethiopia, the recommendation is to commence KMC at the Health Center level. According to this guideline, after the initial stabilization and weight measurement, if the newborn weighs between 2,000-2,500g, is clinically stable, and able to breastfeed, the birth attendant should initiate KMC in the postnatal room and continue care for at least 24 hours before discharge (23).

A prevalent facilitator within the healthcare system, as identified in our study, is the existence of Visual Aids such as television and posters for educational purposes. Additionally, a supportive policy framework, exemplified by hospital promotion and support, emerged as another key facilitator. In alignment with our findings, a study conducted in Cote d’Ivoire identified strong

hospital leadership and active promotion of KMC as facilitators in the successful implementation of KMC practices (64).

A significant obstacle to the optimal application of KMC among healthcare professionals is the lack of comprehensive training and the presence of substantial skill gaps, which impede the proficient execution of KMC protocols and procedures. A study underscored the critical role of training in enhancing the knowledge and competencies of healthcare professionals in delivering KMC (64). According to the current KMC guidelines in Ethiopia, neonatal healthcare providers in postnatal wards and NICU KMC rooms for both unstable and stable infants should undergo training and capacity-building (23). Recognizing training and skill gaps as major barriers, stakeholders of the guideline are committed to addressing and resolving these impediments.

Negative attitudes, stereotypes, or biases among healthcare professionals toward KMC can compromise its acceptance and implementation, potentially stemming from inadequate compensation. These factors contribute to limited attention given to KMC, a consequence of the multitude of competing demands and clinical priorities, thereby delaying its initiation and leading to underutilization. A study conducted in Uganda and Malawi revealed that a positive attitude and acceptance of KMC among healthcare providers can foster optimism and full engagement in KMC practices, albeit with associated challenges (68,69).

Maternal barriers to early KMC can be categorized into emotional challenges (fear, stress, trauma), physical obstacles (exhaustion, post-operative pain), and informational/attitudinal barriers (lack of awareness, non-compliance, preference to go home, lack of belief). Parents expressed anxiety about the perceived fragility of preterm babies, leading to hesitancy in touching their newborns. Maternal stress and fear regarding preterm or low birth weight infants can significantly influence beliefs about their survival and the practice of KMC. Previous research has identified fear, stigma, shame, guilt, and anxiety as substantial hindrances to KMC adoption (66,70). Healthcare providers emphasized the importance of maternal awareness of KMC, revealing that mothers often lacked knowledge about KMC services upon hospital admission. A study in Ghana reported that only 11.4% of mothers knew about KMC at admission, making it challenging to convince them to practice KMC in the initial days after birth (45). Adequate prenatal care and awareness were identified as proactive measures to prepare

mothers for the possibility of preterm birth and the need for KMC. Instances were reported where mothers felt KMC was imposed without proper explanation (66,69,71).

Post-operative pain and discomfort, especially after C-sections, along with fatigue, were identified as critical barriers to early and effective KMC and exclusive breastfeeding. Another cross-sectional study found that 44% of perceived barriers to implementing and continuing early KMC were attributed to pain and fatigue from operations, such as stitches and C-sections (53). Additionally, a formative study highlighted barriers including maternal fatigue, post-delivery backache, poor health, and lack of family support (72).

The willingness of the mother to engage in KMC is identified as a pivotal factor in the successful initiation of this care practice. A positive attitude and active participation from the mother significantly contribute to the early implementation of KMC, with several studies highlighting maternal willingness and empowerment as key facilitators (34,57,66,73).

While paternal resistance presents a critical barrier to the early and effective implementation of KMC, our study highlights family support as a robust facilitator for the prompt initiation and sustained utilization of KMC. This finding aligns with several studies emphasizing the positive impact of family support on KMC practices (53,74). Our research indicates that caregivers predominantly acknowledged the significance of both staff and family support, coupled with a strong desire for their babies' well-being, as major contributors to the provision of KMC. The involvement and willingness of other family members to assist the mother in childcare significantly enhance the adoption of KMC, as evidenced by studies conducted in Uganda and Scandinavian countries (68,75,76).

Our research identified cultural fears and despondency concerning the baby's survival as barriers to the early practice of KMC after birth. This aligns with other studies that have found prevailing fears and a sense of despondency within certain cultural contexts, discouraging timely initiation of KMC (66,70). Cultural perceptions about preterm birth and associated survival rates may undermine maternal confidence in adopting KMC practices. Addressing these barriers within culturally sensitive frameworks is imperative for fostering broader acceptance and integration of KMC practices across diverse cultural and religious contexts.

Our findings revealed that initiating breastfeeding too early was perceived as a potential risk factor for Necrotizing Enterocolitis (NEC). In contrast, delaying feedings due to concerns about NEC was associated with increased central catheter days, a higher risk of acquired bloodstream infections, and delayed gut development (77) and is not recommended as a strategy to reduce NEC (77,78). Maternal worries about insufficient milk secretion and occasional requests for formula milk emerged as barriers to sustained exclusive breastfeeding. A study in Ghana highlighted reasons for delaying breastfeeding initiation, including perceived lack of breast milk, post-birth activities, the belief that both the mother and baby needed rest, and the absence of the baby crying for milk (79). Similarly, in northern Ethiopia, the early initiation of formula feeding acted as a barrier to both early and sustained exclusive breastfeeding (25). Twin births introduced distinct challenges, with mothers facing the simultaneous tasks of holding both infants and facilitating breastfeeding, contributing to heightened fatigue. This underscores the need for tailored support and interventions addressing the specific demands associated with twin deliveries, emphasizing maternal well-being and infant care.

In our study, the majority of mothers expressed an inherent desire to breastfeed, describing it as a delightful experience that enhances the emotional connection and level of attachment between the mother and the infant. This finding is consistent with a study conducted in China (80). Women's awareness and positive perceptions of breastfeeding emerged as significant motivators for the early initiation of exclusive breastfeeding. A study in Northern Ethiopia highlighted that mothers were aware of the importance of exclusive breastfeeding, understanding that it should be initiated as soon as possible and given frequently (25). The recent Ethiopia KMC guidelines emphasize that initially, breastfeeding is provided at fixed intervals of 2-3 hours, rather than on demand, to ensure an adequate and assured minimal intake. Mothers are educated on how to breastfeed while the infant is in the KMC position (23).

6.1. Strength and limitation of the study

Strengths

- ✓ The utilization of secondary data proves to be cost-effective and time-efficient in research endeavors.
- ✓ The incorporation of mixed methods enhances the validity of findings and facilitates a comprehensive understanding of research questions.

- ✓ Secondary data have abundance of variables, offering flexibility for alternative utilization, merging, and exploration in research.

Limitations

- A temporal gap exists between the collection of the utilized secondary data and the current year, with data collected between April 2018 and March 2019. This temporal gap introduces the limitation of lacking current actual findings.
- Interpretation limitations may arise in qualitative data analysis.
- The low coverage of data weakens the statistical power of the analysis, rendering it challenging to identify significant effects or relationships between independent variables and outcomes.
- Constraints in terms of time or resources have the potential to impact the breadth and depth of the study.
- The provided secondary data contains instances of missing and incomplete values, introducing a potential challenge to the overall integrity of the dataset.

7. CONCLUSION AND RECOMMENDATIONS

Conclusion

The coverage of effective early KMC is low. Barriers to effective early KMC and early Exclusive Breast Milk Feeding encompass factors such as limited healthcare resources, skill gaps, healthcare staff attitudes, maternal emotional barriers, post-operative pain, lack of KMC awareness, and cultural pressures for quick post-birth discharge. However, supportive healthcare policies, family involvement, adept counseling, maternal willingness, prior preterm birth experience, regular pregnancy check-ups, and educated mothers act as supportive factors.

Recommendations

Policy/ program level:

- **Resource Allocation:** Allocate additional resources to fortify healthcare infrastructure, ensuring that facilities are adequately equipped to facilitate effective early KMC. This includes provisions for essential equipment, trained staff, and conducive environments for mothers and infants.

- **Health Center Implementation:** Initiate KMC services at health center levels, facilitating broader accessibility and ensuring that effective early KMC practices are integrated into routine healthcare services.
- **Mother-Baby ICU Implementation:** Investigate and subsequently implement the establishment of Mother-Baby Intensive Care Units (ICU). This specialized setup would enable simultaneous case management and KMC, offering a conducive environment for the early initiation and sustained practice of effective KMC. This approach recognizes the potential benefits of integrating critical care services with KMC, enhancing overall maternal and infant health outcomes.

Health facility level:

- Health facility managers and administrators should implement structured programs that prioritize and promote effective early KMC and Exclusive Breast Milk Feeding. These programs should underscore the importance of active family involvement, provide effective counseling services, and include ongoing education for staff members.
- Healthcare providers at the facility level should deliver clear and comprehensive information to parents and families, addressing any concerns and highlighting the positive impact of KMC on infant health and development.
- Health systems should establish protocols for the management of post-operative pain and emotional support for mothers. These protocols should be integrated into routine care plans to ensure that mothers receive the necessary assistance to cope with both physical and emotional aspects post-birth.

For researchers:

- Further studies are necessary to explore the coverage of effective early KMC and identify scalable solutions that effectively address the multifaceted barriers faced by both mothers and healthcare providers.

For communities:

- Initiating community-wide awareness initiatives highlighting the significance of health facility deliveries, integrated with the promotion and incorporation of EeKMC.

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ANNEXES

Annex 1 - Barriers and Facilitators of Effective Early Kangaroo Mother Care (KMC) in selected hospitals in Oromia, Ethiopia, 2023.

Table 4: Barriers and Facilitators of Effective Early Kangaroo Mother Care (KMC) practices in selected hospitals in Oromia, Ethiopia, 2023.

Factors	Barriers	Facilitators
Healthcare System Factors:	Limited resources (KMC beds, teaching aids, KMC manuals) Inadequate KMC room (Unhygienic KMC Room, temperature control, privacy, Uncomfortable and Unsupportive KMC Beds) Lack of Access to KMC Facilities Lack of KMC inclusion in referral process	Quality Improvement Initiatives Visual Aids: Use of TV and posters for education Supportive policy: Hospital promotion and support
Healthcare Professional Factors:	Lack of Training/Skill Gap Low Motivation and Incentives (Low Salary) Shortage of Healthcare Professionals Low HCP attention to KMC Negative Attitudes	Encouragement of Family Involvement Counselling and effective communication with parents
Maternal Factors:	Fear of Holding and Seeing Preterm Baby (Despondency, Fear of Survival) Exhaustion and Fatigue from Delivery Post-operative(C-section) wound Pain and discomfort Lack of prior awareness	Mother's Willingness Previous Experience with Preterm Birth Pregnancy Follow-up Maternal Stability after delivery Maternal Satisfaction and Observing Preterm Newborn

	about KMC Worry About Being Away from Home Postpartum Stress and Trauma Deceased Mother Non-compliance Mothers Preferring to Go Home After Childbirth Mothers' Lack of Belief in KMC	Progress Educated Mother
Infant Factors:	Twin Births	Stable new-born after birth
Support:	Father refusal and reluctance to provide KMC	Family Acceptance and Support Supportive Husband. Support and Assistance from Health Providers.
Socioeconomic Factors:	Socioeconomic Disparity. Need for Clothes and Support. Residency in Rural/Remote Areas or Living Far from Health Facilities Offering KMC.	
Religious and Cultural Beliefs and Practices:	Cultural fears and despondency regarding the baby's survival. Cultural Norms That Rush Mothers to Go Home After Birth (traditional postpartum care). Cultural Norms Discouraging Fathers' Involvement in New-born Care.	

Annex 2 - Questionnaires of In-depth interview for a research project to explore enablers and barriers to effective early Kangaroo Mother Care among mothers and HCPs at the NICU/KMC (English version)

A. Informed information sheet for mothers attending KMC

GREETING!

My name is _____, I am working in _____, and now I am collecting data from you for the research being conducted to explore enablers and barriers of practicing early KMC. We would like to improve the early KMC service being provided in health institutions in the future. We hoped that the discussion with you would be very helpful to strengthen the service and promote the general wellbeing of both the mother and children. Hence, I would like to raise some questions for discussion about the general enablers and barriers of KMC. Before the beginning of the discussion, I wish to express my appreciation for your voluntary participation. Based on the purpose and objectives of the study, I am collecting data from you for the research being conducted to explore enablers and barriers of practicing early KMC. I would like to ask you a set of specific questions. I will be grateful if you can spend some time talking with me. The interview is consent-based, voluntary, confidential, private, and of approximately half an hour duration. Other than a general serial code, your name and other identification aspects are not going to be recorded on the interview sheet. Everything you are going to say will be kept strictly confidential and private. You will not be obliged to respond to one or more of the specific questions that you do not want to answer. However, as long as you find it reasonably convincing, it will undoubtedly be more useful when all of the questions in the interview set are answered.

Person to contact: This research project will be reviewed and approved by the institutional review board of the College of Health Science, department of reproductive family and population health. If you have any questions, you can contact any of the following individuals (Investigator and Advisor), and you may ask at any time what you want:

1. Beyene Roba (BSC), Addis Ababa University, College of Health Science, Department of Reproductive Family and Population Health: ***Principal Investigator***

Cell phone: +251942450505

E-mail: robabeyene84@gmail.com

2. Abiy Seifu (MPH, Assistant Professor), Addis Ababa University, College of Health Science, Department of Reproductive Family and Population Health: ***Main Advisor***

Cell phone: +251118430038

E-mail: abiy.seifu@aau.edu.et

B. Consent and contact for KMC mothers.

I have read or been read this form in a language I understand, and I understand all of the conditions stated above.

There for 1. I agree to participate 2. I do not agree to participate.

Signature ---------- Date ----------

Tool I: In-depth interview with mothers of Low birth weight/preterm infants-eeKMC

#	Item	Response options/ Codes
	Identifiers	
1	Participant ID	
2	Interview date	
3	Language of Interview	
4	Zone	
5	Woreda	
6	Health facility name	
	Background information	
7	What is your age in completed years?	
8	What is your marital status?	1. Single 2. Married/living together 3. Widowed 4. Separated 5. Other (specify)
9	Religion of the respondent?	A. Orthodox B. Catholic C. Protestant D. Muslim E. Traditional F. No religion G. Other (specify)……..
10	Where do you live? (Residency)	A. Urban B. Rural
11	What is your occupation?	
12	How many children do you have?	
13	What is the highest school grade you completed?	
14	Can you read?	1. Yes 2. No
15	Can you write?	1. Yes

		2. No

Build rapport:

- To begin, I'd like to get to know you a little bit more. Tell me, what is it like for you being a mother?
    - Tell me about your family.

Now I would like to talk about early KMC (skin-to-skin contact combined with exclusive breastfeeding) in the first 24 hours after birth)

Early KMC:

- Where did you give birth to your child? Why there/here?
    - Health center, another hospital, in this hospital…
        i. If you didn't give birth at this hospital, why and how did you and your baby come to be brought to this hospital?
            1. What were the transport mechanisms and how long did it take for you to reach here?
            2. Was skin-to-skin contact care initiated before the referral? If yes, how? If not, why not?
- When do you think a mother should begin skin-to-skin contact care for her baby after giving birth? Why?
- When were you admitted to this room [KMC room] after giving birth?
    - What factors contributed to the delay in admitting to this room [>24 hours after birth]?
        i. Were there any infant factors, medical factors, or maternal factors/medical conditions that influenced this decision?
    - Were you brought to this room together with your baby? If yes, why? If not, why not?
        i. If you were brought to the KMC room after your baby, who provided skin-to-skin contact care for the baby? Why was that family member selected, and how did they assist you in giving skin-to-skin contact care? What about

other family member support?

- Were you informed about the reason for your admission to this room [KMC room]? If yes, could you please share who informed you and what you were told? If not, could you explain why you were not informed about the reason for your admission?
- What factors hinder you from admitting to this room [KMC room] and start Kangaroo Mother Care (KMC) early within 24 hours after you gave birth at this hospital?
    - Medical factors (gestational age, birth weight, baby's health)
    - Maternal factors (health, willingness, readiness, postpartum health)
    - Healthcare system support (setting, resource constraints, …
    - Knowledge and education (awareness and counseling)
    - Psychological factors (stress, empowerment, encouragement)
    - Acceptance and beliefs (cultural, religious, alignment with beliefs and values)
    - Healthcare provider attitudes (positive outlook, effective communication)
- What factors enable/ facilitate you to admit to this room [KMC room] and start Kangaroo Mother Care (KMC) early within 24 hours after you gave birth at this hospital?
    - Medical factors (gestational age, birth weight, baby's health)
    - Maternal factors (health, willingness, readiness, postpartum health)
    - Healthcare system support (setting, resource constraints, …
    - Knowledge and education (awareness and counseling)
    - Psychological factors (stress, empowerment, encouragement)
    - Acceptance and beliefs (cultural, religious, alignment with beliefs and values)
    - Healthcare provider attitudes (positive outlook, effective communication)
- What do you think about the benefits of early KMC for premature and LBW babies?
    - ✓ Have you noticed any positive effects of KMC on your child's health and well-being?

Probe: (Helps bond with baby, keeps baby warm, Helps with feeding, Others……

The feeding:

- Can you please describe to me about the feeding experience and feeding progress of your baby starting from birth until now?
    - ✓ How was the infant fed immediately after birth?

- ✓ When did your baby receive the first feeding of breast milk after birth? What factors influenced the timing of your baby's first breast milk feeding?
- ✓ Can you describe to me the feeding methods you have been using for your baby (breastfeeding, bottle feeding, tube feeding, ….)?
- ✓ Apart from breast milk and medication, was your baby given any other substances for feeding? If yes, what were the reasons and timing for this?
- ✓ Have you encountered challenges with exclusive breastfeeding in the KMC unit? How have you overcome these challenges?
- ✓ Do you find that breastfeeding during KMC offers comfort and ease for you and your baby?
- ✓ What information and counseling have you received to support exclusive breastfeeding in the KMC unit?
    - Were you shown how to position and attach your baby to the breast for feeding while practicing KMC?
- ✓ From your perspective, what measures/steps should be taken to facilitate the successful initiation and continuation of exclusive breast milk feeding by parents?

Support and Education:

- Did you receive any form of information, education, support or guidance from healthcare providers or hospital staff regarding KMC initiation and continuation?
    - Did you feel adequately informed and prepared to practice KMC?

Suggestions and Recommendations:

- Based on your experiences, what suggestions or recommendations would you give in initiating and practicing early KMC?
    - Based on your experience, what advice or suggestions would you offer to other mothers who are considering practicing early KMC?
    - What changes or improvements could be made in healthcare facilities to better support and encourage mothers to initiate early KMC?

Wrapping up:

Are there any other issues I haven't brought up that you feel are important and you want to talk through?

Tool II: In-depth interview with health care providers

#	Item	Response options/ Codes
	Identifiers	
1	Participant ID	
2	Interview date	
3	Language of Interview	
4	Zone	
5	Woreda	
6	Health facility name	
	Background information	
7	What is your age in completed years?	
8	Sex	
10	What is your marital status?	1. Single 2. Married/living together 3. Widowed 4. Separated 5. Other (specify)
11	What is your professional background?	
12	What is your main role in this facility	

13	How long have you worked in this facility	

Build rapport:

- To begin, I'd like to get to know you a little bit more. Tell me, what is it like for you being a health care worker?

Early KMC:

- When/after how many hours/ is Kangaroo Mother Care (KMC) initiated for preterm/LBW infants at this hospital? Why/why not?
- When do you think a mother should begin Kangaroo Mother Care after giving birth? Why?
- What factors affect (**hinder**) the early initiation of Kangaroo Mother Care (KMC) within 24 hours after birth at this hospital?
    - **Probe**
        i. Medical factors (gestational age, birth weight, baby's health)
        ii. Maternal factors (health, willingness, readiness, mother's postpartum health)
        iii. Healthcare system support (setting, resource constraints, workload, trained staff, hospital policies)
        iv. Knowledge and education (parents, providers, parental awareness and counseling)
        v. Psychological factors (parental stress, emotional support, family empowerment, encouragement)
        vi. Place of delivery (home, hospital, health centers, and etc…)
        vii. Social support (family, friends, peer groups)
        viii. Acceptance and beliefs (cultural, religious, alignment with beliefs and values)
        ix. Healthcare provider attitudes (positive outlook, effective communication)
- What factors affect (**facilitate**) the early initiation of Kangaroo Mother Care (KMC) within 24 hours after birth at this hospital?
    - **Probe**
        i. Medical factors (gestational age, birth weight, baby's health)
        ii. Maternal factors (health, willingness, readiness, mother's postpartum health)
        iii. Healthcare system support (setting, resource constraints, workload, trained staff, hospital policies)
        iv. Knowledge and education (parents, providers, parental awareness and counseling)

v. Psychological factors (parental stress, emotional support, family empowerment, encouragement)
vi. Place of delivery (home, hospital, health centers, and etc…)
vii. Social support (family, friends, peer groups)
viii. Acceptance and beliefs (cultural, religious, alignment with beliefs and values)
ix. Healthcare provider attitudes (positive outlook, effective communication)

The feeding:

- From your experiences, how do you describe the feeding of preterm/LBW infants at this hospital?
  - ✓ Time of initiation of breast milk feeding after birth? Mechanisms?
  - ✓ What factors affect the immediate initiation and continuation of exclusive breastfeeding for preterm and low birth weight infants after birth?
    - **Probe**
      - Infant Factors (Health and stability, Gestational age and birth weight, Feeding ability, Medical complications)
      - Maternal Factors (Maternal health and well-being, Willingness and confidence, Previous breastfeeding experience, Emotional state)
      - Healthcare Support and Setting (KMC Unit) (Necessary resources: (Breastfeeding education materials, Breast pumps, Informational posters and visual aids, Comfortable seating, Breastfeeding pillows) Availability of skilled staff, Guidance and counseling, Lactation support and education)
  - ✓ Are there instances where LBW/preterm infants receive substances (butter, water, etc.) other than breast milk and medication? What prompts these decisions?
  - ✓ From your perspective, what measures/steps should be taken to facilitate the successful initiation and continuation of exclusive breast milk feeding by parents?

Support and Training and Future Improvements:

- Have you ever received training on KMC/eKMC?

  Probe: What kind of training, when, where, for how long and who give you trainings you received?

- Do you feel adequately prepared to guide parents through the process?

- Based on your insights, what strategies or interventions could be implemented to overcome the barriers and promote the practice of early KMC?

Wrapping up:

Are there any other issues I haven't brought up that you feel are important and you want to talk through?

Annex 3- Kangaroo Mother Care (KMC) Service Provision Observation Checklist (English version)

Observation of overall KMC service provision to explore enablers and barriers to early initiation of KMC.

- ***Date of Observation:***
- ***Health Facility Name:***

A. Pre-Initiation of KMC:

Assessment and Identification:

✓ Are healthcare providers actively assessing infants for eligibility for KMC?

✓ Is there a protocol or guideline for identifying preterm or low birth weight infants suitable for KMC?

Parent Education:

✓ Are parents being educated about the benefits and process of KMC?

✓ Is information provided in a clear and understandable manner?

Readiness of Parents:

✓ Are parents willing and ready to initiate KMC?

✓ Are they comfortable with the idea of skin-to-skin contact?

B. Initiation of KMC:

Timely Initiation:

✓ Are preterm or low birth weight infants being initiated on KMC within the recommended timeframe after birth?

Skin-to-Skin Contact:

- ✓ Are parents practicing proper skin-to-skin contact with their infants?
- ✓ Is skin-to-skin contact maintained for an adequate duration?

Support and Supervision:

- ✓ Are healthcare providers available to assist parents during the initiation process?
- ✓ Do healthcare providers offer guidance on positioning and ensuring infant's safety?

C. Enablers and Barriers:

Enablers of Early KMC Initiation:

- ✓ Availability of a separate space for KMC ward
- ✓ If there is an availability of space for KMC,
  - The size of the space……and Numbers of beds……
  - KMC room well illuminated and comfortable for mother's
- ✓ Are there clear protocols and guidelines for KMC initiation?
- ✓ Is there a supportive and encouraging attitude from healthcare providers?
- ✓ Are healthcare providers assisting and guiding parents in proper feeding techniques during KMC sessions?

Barriers to Early KMC Initiation:

- ✓ Are there challenges in identifying eligible infants due to lack of resources or awareness?
- ✓ Are parents hesitant to initiate KMC due to cultural or other factors?
- ✓ Are there issues with healthcare staff workload impacting their ability to support KMC initiation?

Communication and Counseling:

- ✓ How effectively are healthcare providers communicating with parents about KMC?
- ✓ Is counseling provided to address concerns or misconceptions about KMC?

D. Overall Quality of Care:

- ✓ KMC Room sanitation? clean and hygienic? (Observe Hand washing (practice & setup), latrine, shower, cleanliness of the room)
- ✓ Are infection control measures being followed during KMC practice?
- ✓ Are parents comfortable during KMC sessions?

- ✓ Are they actively involved in the care of their infants?

Documentation:

- ✓ Is there a system in place to document KMC initiation and progress?
- ✓ Is there a clear feeding chart for babies practicing KMC?
- ✓ Is infant weight monitored and recorded regularly?

E. Recommendations:

Areas for Improvement:

- ✓ Based on the observation, what areas could be improved in the KMC service provision?

Strengths and Best Practices:

- ✓ What aspects of the KMC service provision are working well and could serve as best practices?

F. Materials in KMC unit

I. KMC leaflet available Y N
II. KMC eligibility criteria available Y N
III. List of danger signs available Y N
IV. KMC follow up form available and updated Y N
V. Feeding chart available Y N
VI. Weight monitoring chart available and recorded Y N
VII. KMC admission register available Y N
VIII. Diaper available Y N
IX. Socks available Y N
X. Cap available Y N
XI. Pillow Y N
XII. Mattress Y N
XIII. Bed sheet Y N

Annex 4 - Questionnaires of In-depth interview for a research project to explore enablers and barriers to early Kangaroo Mother Care among mothers and nurses at the NICU/KMC (Afan Oromo version)

Dabalata 3 - Gaaffiilee Af-gaaffii gadi fageenyaa pirojektii qorannoo dandeessistootaa fi gufuulee Kunuunsa Haadholii Kaangaroo hatattama haadholii fi narsoota NICU/KMC keessatti qorachuuf

A. Waraqaa odeeffannoo haadholii kunuunsa KMC keessattiif

NAGAA GAAFACHUU!

Maqaan koo _____ jedhama, _____ keessatti hojjechaa jira, amma qorannoo dandeessistootaa fi gufuulee KMC hatattama shaakaluu qorachuuf gaggeeffamaa jiruuf daataa isin irraa walitti qabaa jira. Tajaajila KMC hatattama dhaabbilee fayyaa keessatti kennamaa jiru gara fuulduraatti fooyyessuu barbaanna. Mariin isin waliin taasifamu tajaajila cimsuu fi fayyaa waliigalaa haadhaa fi daa'immanii guddisuuf baay'ee akka gargaaru abdii qabna. Kanarraa ka'uun, waa'ee dandeessistootaa fi gufuulee waliigalaa KMC irratti gaaffiiwwan tokko tokko mariif kaasuun barbaada. Mariin kun osoo hin jalqabin dura hirmaannaa fedhii irratti hundaa'e keessaniif dinqisiifannaa akkan qabu ibsuun barbaada. kaayyoo qorannichaa irratti hundaa'uun qorannoo dandeessistootaa fi gufuulee KMC hatattamaa shaakaluu qorachuuf gaggeeffamaa jiruuf daataa isin irraa walitti qabaa jira. Gaaffii addaa tokkon isin gaafachuu barbaada. Yeroo muraasa na waliin haasa'uu yoo dandeesse nan galateeffadha. Af-gaaffiin kun hayyama irratti kan hundaa'e, fedhii ofiitiin, iccitii kan qabu, kan dhuunfaa fi tilmaamaan walakkaa sa'aatii kan fudhatudha. Koodii tartiiba waliigalaatiin alatti maqaan kee fi wanti eenyumma kee adda baasuu biroo waraqaa af-gaaffii irratti galmaa'uuf hin jiran. Wanti ati jechuuf deemtu hundi iccitii fi dhuunfaa cimaa ta'ee ni eegama. Gaaffii addaa deebii kennuu hin barbaanne keessaa tokko ykn isaa ol deebisuuf dirqamni sirra hin jiru. Haa ta'u malee, hamma amansiisaa ta'ee sitti mul'atutti, gaaffiiwwan tuuta af-gaaffii keessa jiran hundi yeroo deebii argatan caalaatti faayidaa akka qabu shakkii hin qabu.

Eenyu qunnamuu ykn gaafannu: Pirojektiin qorannoo kun boordii gamaaggama dhaabbilee Kolleejjii Saayinsii Fayyaa, kutaa fayyaa maatii walhormaataa fi uummataatiin ni gamaaggama, ni raggaasifama. Gaaffii yoo qabaattan namoota dhuunfaa armaan gadii keessaa kamiyyuu

(Qorannoo fi Gorsaa) qunnamuu dandeessu, yeroo barbaaddanittis waan barbaaddan gaafachuu dandeessu:

3. Beyene Roobaa (BSC), Yuunivarsiitii Addis Ababa, Kolleejjii Saayinsii Fayyaa, Kutaa Fayyaa Walhormaataa Maatii fi Uummata: **Qorataa Muummee**

Bilbila harkaa: +251942450505

Imeelii: robabeyene84@gmail.com irratti ergaa

4. Abiy Seifuu (MPH, Gargaaraa Piroofeesaraa), Yuunivarsiitii Addis Ababa, Kolleejjii Saayinsii Fayyaa, Kutaa Fayyaa Walhormaataa Maatii fi Uummata: **Gorsaa Guddaa**

Bilbila harkaa: +251118430038

Imeelii: abiy.seifu@aau.edu.et

B. Unkaa Hayyama haadholii KMC.

Unka kana afaan anii dandahuun naaf dubbiseera ykn dubbiseera, haal-duree armaan olitti ibsaman hundas nan hubadha.

Kanaaf: 1. Hirmaachuuf walii gala ☐ 2. Hirmaachuuf walii hin galu. ☐

Mallattoo _____ Guyyaa _____

A. Gaaffiiwwan haadholii kutaa KMC keessatti hirmaatan biratti KMC hatattamaa shaakaluudhaaf dandeessistootaa fi gufuulee qorachuuf.

Seensa
1.1 Koodii gaafataa: 1.2 Guyyaa af-gaaffii: 1.3 Bakka af-gaaffii:
Kutaa I: Amaloota hawaas-dimoogiraafii
1. Umurii waggaa guutuudhaan?.....
2. Haala gaa'elaa? A. kan hin heruumin □ B. kan heruumte □ C. wal hiikan □ D. Dubartii abbaan manaa irraa du'e □
3. Amantii ? A. Ortodoksii □ B. Kaatolikii □ C. Pirootestaantii □ D. Muslima □ F. Aadaa □ G. Amantii hin qabu □ H. Kan biroo (ibsi) _____
4. Eessa jiraatta? (jireenya) Magaalaa □ Baadiyyaa □
5. Sadarkaa barnootaa deebii kennaa? A. Dubbisuu fi barreessuu hin dandeenye □ B. Mana barumsaa sadarkaa tokkoffaa (1-8). □ C. Mana barumsaa sadarkaa lammaffaa (9-10) □ D. Mana barumsaa qophaa'ina (11-12) □ E. Dippiloomaa □

F. Digirii fi isaa ol □
6. Haala hojii deebii kennaa? A. Hojjetaa guyyaa guyyaa □ B. Barataa □ C. Haadha manaa □ D. Hojjetaa mootummaa □ E. Hojjetaa dhaabbata miti mootummaa □ F. Hojjetaa damee dhuunfaa □ G. Daldalaa/Daldala □ H. Qonnaan bulaa □ I. Kan biroo (ibsi) _____
7. Giddugaleessa galii ji'aa deebii kennaa? Ji'atti nama tokkoof birriidhaan A. Galii Gadi aanaa (sarara hiyyummaa idil-addunyaa): <= 3000 □ B. Galii Gadi-Giddugaleessaa: 3000-15,000 □ C. Galii Ol'aanaa-Giddugaleessaa: 15,000-30,000 □ D. Galii Ol'aanaa: >=30,000 □

Kutaa II. Amma waa'ee KMC hatattamaa dubbachuu barbaada

Gaaffiiwwan ijoo:

1. Haati tokko erga deessee booda kunuunsa haadha kangaroo yoom jalqabuu qabdi?

2. Faayidaa KMC hatattama daa'imman yeroo malee dhalataniif fi kg 2 gadi ta'aniif qabu maal jettu?

Qorannoo/probe:

□ Daa'ima waliin walitti dhufeenya uumuuf gargaara

□ Daa'ima akka ho'u taasisa

□ Nyaachisuuf gargaara _____

3. KMC daftee akka jalqabdu wantoota si dandeessisan maali? Warra daa'imman yeroo malee dhalatanii fi kg 2 gadi ta'aniif KMC dafanii akka fayyadamaniif wantoota haala mijeessan?

Gaaffiiwwan Muraasa:

1. Deeggarsa hawaasaa KMC hatattamaa akkamitti ibsita?

2. Deeggarsa miseensota maatii KMC hatattamaa akkamitti ibsita?

3. Hojjettoota fayyaa fi deeggarsa KMC hatattamaa akkamitti ibsitu?

4. Waa'ee ilaalcha aadaa fi amantii fi deeggarsa KMC hatattamaa maal jettu?

Qorannoo/probe:

- Fudhatamummaa
- Aadaa
- Amantaa
- ilaalchaa/amantii

Gaaffiiwwan ijoo:

4. Warra daa'imman yeroo malee dhalataniifi kg 2 gadi ta'aniif danqaaleen fi qormaanni itti fayyadama KMC dafanii maal fa'a?

Gaaffiiwwan Muraasa:

a. Qormaata maatii fi hawaasaa shaakala KMC hatattamaa akkamitti ibsita?

b. Ilaalcha aadaa fi amantii fi gufuulee shaakala KMC hatattamaa akkamitti ibsitu?

c. Hojjettoota fayyaa fi danqaawwan KMC hatattamaa kaa'uu akkamitti ibsitu?

d. Yeroo fi danqaawwan yaalaatiin walqabatan KMC hatattamaa akkamitti ibsitu?

Qorannoo/probe:

- Fudhatamummaa
- Aadaa
- Amantaa
- Amantii/ilaalcha

N.B. Wanti biraa hanga ammaatti hin mari'anne kan itti dabaltan kan marii fi argannoo keenyaaf barbaachisaa ta'e jettanii yaaddan jiraa?

2. Gaaffiiwwan dandeessistootaa fi gufuulee KMC hatattamaa/dafee kennitoota kunuunsaa NICU keessatti hojjetan biratti qorachuuf.

1. Haala ogummaa……..

2. Muuxannoo hojii , waggaa…….

Gaaffiiwwan ijoo:

3. KMC irratti leenjii fudhattanii beektuu?

4. Pirojektii KMC battalaa irratti leenjii fudhattaniittuu? (Probe: Leenjii akkamii argatte?)

5. Haati tokko erga deessee booda kunuunsa haadha kangaroo yoom jalqabuu qabdi?

6. Erga da'umsa booda sa'aatii 24 jalqabaa keessatti KMC jalqabuu maal jettu? (Qorannoo/probe: Faayidaa fi rakkoon isaa maali? Akkamitti salphisa?)

7. Faayidaa KMC jalqabaa daa'imman yeroo malee dhalataniif fi kg 2 gad ta'aniif qabu maal jettu?

Qorannoo/probe:

- Daa'ima waliin walitti dhufeenya uumuuf gargaara
- Daa'ima akka ho'u taasisa
- Nyaachisuuf gargaara
- Kan biroo.....

8. Daa'imman yeroo malee dhalataniif fi kg 2 gad ta'aniif dhaabbata keessan keessatti shaakala KMC hatattamaa kan dandeessisan maali?

Gaaffiiwwan xiqqaa:

1. Deeggarsa kunuunsitootaa fi miseensota maatii KMC akkamitti ibsita?

2.Hojjetoota fayyaa fi deeggarsa kaa'umsaa KMC akkamitti ibsitu?

Qorannoo/probe:

- Fudhatama qabaachuu
- Aadaa
- Amantii
- Amantii/ilaalchaa

Gaaffiiwwan ijoo:

9. Daa'imman yeroo malee dhalataniifi kg 2 gad ta'an waliin shaakala KMC jalqabaa irratti gufuulee fi qormaanni maal fa'a?

Gaaffiiwwan xiqqaa:

a. Qormaata kunuunsituu hojii KMC irratti qabu akkamitti ibsita?

b. Miseensota maatii fi qormaata hawaasaa shaakala KMC irratti akkamitti ibsitu?

c. Sirna fayyaa fi danqaawwan KMC shaakaluudhaaf kaa'uu akkamitti ibsitu?

d. Gufuulee aadaa fi amantii shaakala KMC irratti mul'atan akkamitti ibsitu?

Qorannoo/probe:

- Fudhatama qabaachuu
- Aadaa
- Amantii
- Amantii/ilaalcha

N.B. Wanti biraa hanga ammaatti hin mari'anne kan itti dabaltan kan marii fi argannoo keenyaaf barbaachisaa ta'e jettanii yaaddan jiraa?

Annex 5 - Observation checklist (Afan Oromo version)

Dabalata 4: Tarree sakatta'iinsa ilaalchaa

Dandeessitootaa fi gufuulee KMC dafanii jalqabuu qorachuuf kenniinsa tajaajila waliigalaa KMC ilaaluu.

1. Kutaa KMC tiif bakki addaa jiraachuu

    1) Eeyyee 2) lakki

2. KMC'f bakki yoo jiraate, .

    a) Guddina iddoo sanaa.....

    b) Lakkoofsa siree.....

3. Qulqullina kutaa KMC? qulqulluu fi qulqullina qabu? (Harka dhiqachuu (practice & setup), mana fincaanii, shawaariin, qulqullina kutaa ilaaluu)

4. Kutaa Daa'immanii keessatti ogeeyyiin fayyaa meeqatu hojjetan?

5. Tajaajila kennitoota kana keessaa meeqatu KMC irratti leenji'ee jira?

6. Haadholiin KMC dafanii akka jalqabaman agarsiisaa fi deeggarsa godhameef.

7. Meeshaalee yuunitii KMC keessatti argaman

    I. Barruu KMC kan argamu Y N

    II. Ulaagaaleen ulaagaa KMC jiran Y N

    III. Tarree mallattoolee balaa jiran Y N

    IV. Unka hordoffii KMC kan jiruu fi kan haaromfame Y N

    V. Chaartii nyaataa ni argama Y N

    VI. Chaartiin hordoffii ulfaatinaa kan jiruu fi galmaa'e Y N

    VII. Galmeen galmee KMC ni argama Y N

VIII. dayippariin ni argama Y N

IX. Socks/kaalsiin ni argamu Y N

X. Kophee argamu Y N

XI. Barcuma Y N

XII. Firaasha Y N

XIII. Siree siree Y N

XIV. Kutaan KMC akka gaariitti kan ibsamee fi mijataa haadha Y N