

# Barriers and Facilitators to Kangaroo Mother Care Implementation in Côte D'Ivoire: A Qualitative Study

**Kadidiatou Raissa Kourouma** (✉ [kkouroum@gmail.com](mailto:kkouroum@gmail.com))

Cellule de Recherche en Santé de la Reproduction/Institut National de Santé Publique

**Marie Laurette Agbré Yacé**

Cellule de Recherche en Santé de la Reproduction/Institut National de Santé Publique

**Daouda Doukouré**

Cellule de Recherche en Santé de la Reproduction/Institut National de Santé Publique

**Lassina Cissé**

Service de Pédiatrie/Centre Hospitalier Universitaire de Treichville

**Chantière Somé-Meazieu**

Service de Pédiatrie/Centre Hospitalier Universitaire de Treichville

**Joseph Ouattara**

Service de Pédiatrie/Centre Hospitalier Universitaire de Treichville

**Akoua Tano-Kamelan**

Cellule de Recherche en Santé de la Reproduction/Institut National de Santé Publique

**Virginie Konan Kouakou**

United Nation Children's Fund

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## Research Article

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# Abstract

## Background

Kangaroo Mother Care (KMC) is a key high impact intervention, low technology and cost-effective for the care of preterm and low birth weight newborn. Côte d'Ivoire has adopted the intervention and opened the first KMC unit in 2019. After one year of functioning, we aimed to assess barriers and facilitators of KMC implementation as well as proposed solutions to improve KMC implementation in Côte d'Ivoire.

## Method

This was a qualitative study, using semi-structured interviews, carried out in September 2020 in the first KMC unit opened at the Teaching Hospital of Treichville. The study involved healthcare providers providing KMC and mothers of newborn who were receiving or received KMC at the unit. A thematic analysis was performed using Nvivo 12.

## Results

A total of 44 semi-structured interviews were conducted, 12 with healthcare providers and 32 with mothers. The barriers identified were lack of supplies, insufficiency of human resources, lack of space for admission, lack of home visits, lack of food for mothers, lack of collaboration between health services involved in newborn care, increased workload, the beliefs of carrying the baby on the chest, partner resistance, low rate of exclusive breastfeeding, lack of community awareness. Facilitators identified were training of healthcare providers, leadership, the cost of the intervention, the value of the intervention for healthcare providers, mothers –healthcare providers relationship, mothers' adherence to KMC.

The proposed solution to improve KMC implementation were volunteer staff motivation, intensifying mothers and families education and counselling, the recruitment of a psychologist and the involvement of all stakeholders.

## Conclusions

Our study highlighted the challenges to implement KMC in Côte d'Ivoire with unique and specific barriers to implementation. We recommend to researchers and decision makers to respectively design strategies and adopt intervention that specifically address these barriers and facilitators to a better uptake of KMC. Decision makers should also take into account the proposed solution for a better implementation and scaling up of KMC intervention.

## Background

Health systems at all levels of development are under pressure to provide high quality of care based on the best available evidence. As available evidence, the use of Kangaroo Mother Care (KMC) is recommended by the World Health Organization (WHO) as a key high impact intervention, low technology and cost-effective for the care of preterm and low birth weight (LBW) newborns who are at high risk of neonatal mortality and morbidity [1–4]. KMC comprises a set of care practices including include a set of early, continuous, and extended skin-to-skin contact between infant and caregiver; exclusive breastfeeding. KMC practice is often associated with early discharge from hospital and necessary support for caregiver and infant at home [5, 6]. WHO recommends the continuation of KMC until the newborn's gestational age reaches term (gestational age around 40 weeks) or the weight reaches 2500 g [5].

This intervention is especially helpful for low and middle income countries (LMICs) such as sub-Saharan African countries to improve the survival and health of high risk newborn in a context where the majority of neonatal death occurs and incubators are not widely available [7].

KMC is epitomized by the Every Newborn Action Plan (ENAP) [8], and adopted in many countries such as India, Indonesia, Ghana, Uganda, South Africa, Malawi, Papua New Guinea, Côte d'Ivoire which have made it a priority [9–17].

In Côte d'Ivoire, the country moved to the operationalization phase of KMC in 2019 following the adoption of the ENAP 2018–2020 [17]. As a result, the Ministry of Health with the financial and technical support of UNICEF opened in February 2019, the first KMC unit in the Teaching Hospital of Treichville (CHUT) with the objective to scale up this intervention. However, to adequately implement and effectively scale up KMC intervention, it is fundamental to understand factors that may influence the intervention. Indeed, as each context setting presents organizational, professional, maternal and cultural particularities, identification of facilitators and barriers is critical to improve the implementation of clinical practice strategies[18].

Despite there are many studies published on barriers and drivers of implementing KMC [19–23], we assume that Côte d'Ivoire may have some unique barriers and facilitators to the practice of KMC due to the country specificities in terms of policies, resources and traditional culture. Besides, we are not aware of any prior published studies in Côte d'Ivoire exploring these barriers and facilitators. Therefore, we carried out a qualitative study to investigate barriers and facilitators of KMC implementation and proposed solutions to improve KMC implementation.

## **Method**

The present study is part of a larger project that aimed to document the implementation process of KMC in Côte d'Ivoire. In the current study, we collected data from semi-structured interviews in order to identify barriers and facilitators of KMC implementation as well as proposed solutions to improve its implementation.

## **Study setting**

This study was conducted in September 2020 in the KMC unit of the CHUT created in February 2019 through the technical support of UNICEF. The rehabilitation of the oral rehydration center was realized to create the KMC unit. The unit is part of the neonatology intensive care unit (NICU), however the KMC unit is located on the ground floor and the NICU on the second floor. The KMC unit is composed of the pediatrician's and midwives offices, one training room, one living room equipped with a television for educational sessions, a large room with a capacity of nine beds with armchairs for mothers, two bathrooms for mothers and healthcare providers, and one dining room adjacent to a small kitchen for the mothers to cook. Only continuous KMC is provided in the unit however in some case intermittent KMC is initiated in NICU before the dyad leaves for KMC Unit. The medical staff working at the unit is composed of 01 pediatrician, 02 midwives, 02 nurse aids, 01 childcare worker and 02 volunteers. Healthcare providers help mothers to settle in and prepare (e.g, positioning the child, etc.) for skin-to-skin contact and child feeding.

## **Study design**

Our aim was more to identify themes than interpret perspectives, therefore we employed qualitative description methodology with thematic analysis to study the question what are the facilitators and barriers to KMC implementation as well as proposed solution to improve implementation? To collect data for the study, we convened to use semi-structured interviews.

## **Participants and sampling**

The study population was composed of two main categories of participants: mothers and healthcare providers.

Concerning mothers, the sample comprised the mothers admitted with their child who were receiving KMC and those discharged who received KMC. We only focused on mothers because as the primary target, they were most likely to be present in the KMC unit. We used the principle of saturation to end the interview with mothers.

As for healthcare providers' category, it included the healthcare providers working at the KMC Unit of the CHUT (08) and the healthcare providers in charge of KMC in the following four general hospitals (04): Marcory, Koumassi, Port-Bouët, and

Treichville. These general hospitals belong with the KMC unit to the perinatal network and refer preterm and LBW newborn to KMC unit.

## Data collection

Two interview guides, one for each target population, were designed by the research team around the following topics practice of KMC, barriers and facilitators of KMC implementation and proposed solution to improve implementation.

Data were collected by two data collectors with a master's degree in sociology. They received one-day training on general survey procedures and the content of the interview guides. The interview guides were initially piloted on a small sample to ensure that questions were relevant and easily understood by the interviewees.

During data collection, healthcare providers were invited by the data collectors to an individual one to one interview at the KMC Unit. As for mothers, they were invited to participate in the interviews in a room located in the pediatric ward outside the KMC unit so that they would be more comfortable answering questions. Prior to interviews, all participants were asked to provide written consent after a further opportunity to have their questions answered. All participants agreed to have their interview recorded. Interviews lasted on average 40 minutes (range 35–45 minutes). Regarding mothers' interviews saturation was reached after the 32nd interview.

## Data analysis

All interviews were transcribed verbatim in Microsoft Word from audio-recordings. Interview recordings were transcribed by the first and the third author. The resulting transcripts were de-identified, seen only by study team members, and housed securely in an online storage service. A thematic analysis was carried out using NVivo 12 software. We developed a codebook to describe the themes and sub themes and used it to code the transcripts. The results of the coding were synthesized in matrices according to themes (barriers, facilitators, proposed solution to improve KMC implementation).

## Results

### Participants' characteristics

Forty-four respondents, including 12 healthcare providers involved in KMC implementation and 32 mothers who were receiving or received KMC, participated in the study. Regarding healthcare providers sample, it was composed of 05 pediatricians, 02 midwives, 02 nurse aids, 02 volunteers' staff and 01 childcare worker. They all had less than 2 years' experiences in KMC. The sample of healthcare providers comprised 02 males and 12 women and their age varied from 35 to 50 years old.

Concerning the mothers interviewed, their ages ranged between 18 and 47 years old. Twenty of them were married living with their husbands and twelve were single/engaged. The number of children varied between 1 and 8. The majority of the mothers had attended secondary school, only ten of them had a university level. As for occupation, five of them were students, eleven were unemployed, four were civil servants and twelve were self-employed.

### Identified barriers and facilitators at KMC unit level

When analyzing and comparing the interviews, in some cases the same theme emerges in both staff and patient interview but in other case arose only in staff or patient interview.

### Identified barriers

From the interviews seven major barriers emerged at the KMC unit level : lack of food for mothers, lack of space for admission, lack of collaboration between services involved in newborn care, lack of supplies, insufficiency of human resources, increased workload, lack of home visit

## Lack of food for mothers

A common barrier mentioned by healthcare providers and mothers was the lack of food for mothers. The KMC unit does not provide meals to mothers admitted for continuous KMC, which leads women to take turns preparing their meals. Moreover, family members are obliged to bring food or money.

*" At this time, the unit does not have a budget to provide food to the mothers. They are therefore obliged to prepare food themselves in turn... When one of them is cooking, the others or the nurse aids look after her child. We are currently advocating with the national nutrition program and some implementing partners to find a solution to this issue..." (HP1, pediatrician)*

The same concern was expressed by this mother:

*"Hummm....when I have to leave my child to go to cook I am always worried.... the times when my sister comes with the food it is still expenses for the transport because we live far away..."(M2, 25 years old)*

## Lack of space for admission

Another barrier cited by the healthcare provider to KMC implementation was the lack of space for admission bed to receive more preterm newborn that are eligible for KMC as reported by this healthcare provider :

*"We do not have enough space to hospitalize premature babies eligible for kangaroo mother care. From March 2019 to July 2020, out of 319 newborns hospitalized in neonatology and eligible for SMK, 209 were admitted to the SMK unit. We did not take the other eligible newborns due to lack of beds" (HP2, midwife)*

## Lack of collaboration between services involved in newborn care

A common theme among healthcare providers was the lack of collaboration between services involved in newborn care mainly gynecology services and pediatric services. Healthcare providers agreed that a multidisciplinary collaboration can impact positively preterm and LBW babies outcomes. One healthcare provider stated:

*"There is a lack of collaboration between perinatal specialists .... Pediatricians, midwives and obstetricians for instance. The organization of meetings, common staff between us could really improve outcomes for newborn especially preterm and low birth weight"(HP12, pediatrician)*

## Lack of supplies

The lack of supplies mainly oxygenator and aspirator has been reported by some healthcare providers working at the KMC Unit. Faced with the lack of oxygenator and aspirator in the KMC unit, they believe that these devices are essential for preterm and LBW babies survival and strongly hopes that the unit will get them, as stated by one them:

*"I sincerely wish we could have our own aspirator in the unit. When the babies swallow the wrong way we go upstairs with them in NICU to be able to use their aspirator with all the risks that this may entail ". (HP4, nurse aid)*

## Insufficiency of human resources

For the healthcare providers the insufficiency of human resources impeded KMC implementation. This statement is illustrated by the following quotation:

*" We really need more staff in the unit....Because of the lack of human resources we can not take our time to do other important activities such mother's counseling which requires time, we are obliged to rush" (HP5, volunteer staff)*

## Increased workload

For some healthcare providers, one barrier to KMC implementation is the increased workloads especially for those working in the other facilities of the perinatal network that refer eligible babies to the KMC unit.

*" At the general hospital of Port-Bouët, I am the only one who has been trained on kangaroo mother care, we have a lot of births here...it is not easy to manage everything. I am in the process of training a nurse's aid to help me with this activity... Given the number of eligible babies that we refer to the SMK unit of CHUT, we are advocating for the opening of a unit in our hospital"* (HP11, pediatrician)

## **Lack of home visits**

Healthcare providers also acknowledged that with the lack of human resources, it is difficult for the unit to carry out home visits after the discharge of the dyad. For them, home visits are important to continue KMC within the community as noted by one of them:

*"Unfortunately we do not yet make home visits, which does not allow us to appreciate the continuity of KMC within the community"*(HP1, pediatrician)

## **Identified facilitators**

Five themes emerged from the interviews: training of healthcare providers, leadership, the cost of the KMC intervention, the value of the intervention for healthcare providers and mothers – healthcare providers relationship.

## **Training of healthcare providers**

Healthcare providers reported the training they received was crucial in increasing their knowledge and competences on how the KMC should be provided.

*"...We participated in a very interesting training which gave us the knowledge and competences to provide KMC. This training was also a good refresher training for us.....we could go back to basics such as newborn care with a focus on preterm and low birth weight "* (HP12, pediatrician)

## **Leadership**

A common driver cited by healthcare providers was the leadership of the head of the pediatric service that promote KMC. The head of the pediatric service ensured provision of training, of equipment through advocacy. As reported by healthcare providers, this strong leadership motivates them to do their best to provide KMC. This statement is illustrated by the following quote.

*"We have started slowly....but look at what level we are today.....we are committed to the implementation of KMC thanks to the leadership of our head of pediatric service who really boosted us and made us adhere to his vision of KMC"* (HP1, pediatrician)

## **The cost of the intervention**

A common driver among mothers is the cost of the intervention compared to conventional care using incubators, as reported by this mother:

*"It is a practice that does not require too much financial means..... my sister gave birth to a premature baby, it is currently in an incubator and it is really expensive (M20, 27 years old)".*

## **The value of the intervention for healthcare providers**

Another factor that has facilitated the implementation of KMC is the value of the intervention for the healthcare providers. Indeed, the majority of healthcare providers recognized the benefits of this method, which they consider to be a

humanization of care and a form of tasks shifting from the healthcare provider to the mother, who becomes the main actor in the care given to the newborn, as explained by this pediatrician:

*"KMC are a blessing!!!!....this method will save many premature and low birth weight newborn. I find that KMC are humanized and the mother also participates in these cares which allows them to better assess the evolution of their child than when it is in an incubator..."* (HP11, pediatrician)

## **Mothers-healthcare providers' relationship**

Another driver that emerged from mothers' interview was the good interpersonal relation with healthcare providers. Mothers reported feeling supported by healthcare providers at the KMC unit. Mothers considered that the listening skills of healthcare providers, the way they behave with them and became familiar facilitated their uptake of KMC, as stated by this mother:

*"At at the very beginning I was really anxious, I was afraid to hurt my baby but the health staff was great, the midwives were patient with me, they supported me and gradually I was able to take care of my child without any problem..."* (M13, 30 years old)

## **Identified barriers and facilitators at mothers/families/community level**

### **Identified barriers**

From the interview, four main barriers emerged: beliefs about carrying a newborn on the chest, partner resistance, the low rate of exclusive breastfeeding and lack of community awareness.

### **Beliefs about carrying a newborn on the chest**

Some healthcare providers reported experience with some mothers who refused to adhere to KMC because carrying a newborn on the chest is not well perceived in their culture.

*"Unfortunately, we are sometimes confronted with mothers who are reluctant to use the method because of their beliefs about carrying the child on their chest...According to these women, in case of danger, if the child is on the chest, it will be the most exposed".* (HP8, volunteer staff)

### **Partner resistance**

Some partners find it difficult to accept being separated from their spouse and child while the child is not in an incubator. For them, having their wife care for the child without the child being in an incubator means that she can also do so at home. One mother explained this situation as follow:

*".... at the beginning I was doing intermittent Kangaroo because the baby was in the incubator... but since the baby went down to the unit for continuous Kangaroo.... my husband's behavior has changed; for him the fact that the baby is no longer in the incubator means that it is better and that we can be discharged...."* (M20, 32 years old)

### **Low rate of exclusive breastfeeding**

Exclusive breastfeeding is one of the components of KMC, but few mothers were conducting exclusive breastfeeding. This was considered as a hindrance to KMC implementation by some healthcare providers, as stated by one of them:

*".... Normally KMC is supposed to increase exclusive breastfeeding but here when you look at the numbers the breastfeeding rate is low, mixed feeding is what women do most....we really need to address this ...."* (HP4, nurse aid)

## Lack of community awareness

Another hindrance barrier that emerged from interviews was the lack of community awareness. For the participants this lack of community awareness has led to a lack of information on KMC. Healthcare providers and mothers alike agreed that as illustrated by the following quotes.

*"Community awareness is a component of this intervention...unfortunately we were not able to realize it... A good sensitization of the community would have made it possible to provide adequate information on KMCs and to act on the community's adherence to this practice..."* (HP1, pediatrician)

In alignment with this statement, one mother declared:

*"It was only when my child was admitted here that I learned about kangaroo mother care ....I had never heard about it before....that's why the beginning was difficult for me....If it was something I knew before maybe I wouldn't be so worried about my child ...."* (M30, 31 years old)

## Identified facilitators to KMC implementation

### *Mothers adherence to KMC*

The adherence of mothers to KMC was the only facilitator at mothers/families/community level that facilitated the implementation of the intervention. For the healthcare providers, mothers have understood the value of the intervention which allowed them to adhere to it as stated by this volunteer:

*"The majority of the mothers we have received here have recognized the value of this practice for their child....this is what has allowed us to carry out our activities without too much resistance from them"* (HP7, volunteer staff)

This adherence to SMK is also illustrated by this mother statement:

*"When I arrived at the KMC unit...I was afraid of carrying my child on my chest and I was not sure that it would not help him/her develop....but little by little, with what the midwives taught me, I began to see my child develop and to have confidence in this method."* (M15, 34 years)

## Proposed solutions to improve KMC implementation

The healthcare providers were asked about suggestions to improve KMC implementation at the unit. The proposed solutions were volunteer staff motivation, mothers and families education and counselling, the recruitment of a psychologist, involvement of all stakeholders.

## Volunteer staff motivation

One solution to improve KMC implementation and service delivery was to motivate the volunteer staff through financial incentive.

*"Volunteer staff is a great help in the implementation of SMK given the shortage staff and they need to be motivate. As far as I'm concerned their participation in training is not enough to motivate. If we want retain this staff we need to give them financial incentives..."* (HP3, midwife).

## Intensifying mothers and families education and counselling

According to the majority of healthcare providers, there is a need to intensify mothers and families education and counseling on KMC by the use of appropriate messages to make them totally adhere to the intervention.

*"I think that we need more time, more information and education tools to obtain the adherence of mothers and their relatives ...."* (HP5, nurse aid)

## **The recruitment of a psychologist**

For the majority of healthcare providers interviewed, the presence of a psychologist in the unit is crucial to support the mother during their admission especially young mothers as they report more psychological distress.

*"We need a psychologist in the unit ....we have had cases of young mothers who could not practice the method because it was their first pregnancy with a preterm newborn. Most of these young mothers do not necessarily have the support of their families or the child's father, which puts them in a stressful situation that does not facilitate the production of milk."* (HP2, midwife)

## **Involvement of all stakeholders**

The common proposed solution was the involvement of all stakeholders to improve KMC implementation. For this healthcare providers besides the user engagement, the success of the implementation also requires the involvement of stakeholders from diverse background notably community, policy makers, the technical structures of the ministry of health, the partners of implementation, private structures, technical and financial partners.

*"For KMC implementation to be successful, we need the commitment of all stakeholders. For example, structures such as the National Nutrition Program and the World Food Program can help us provide food to mothers in a sustainable way."* (HP11, pediatrician)

## **Discussion**

This is the first study carried out in Côte d'Ivoire to identify barriers and drivers to KMC implementation as well as solution to improve provision and uptake of KMC.

## **Barriers of KMC implementation**

At the KMC unit level, barriers that have already been reported as barriers to KMC in countries, such as Malawi and Indonesia [11, 15], have been identified in our study. These were lack of supplies, lack of food for mothers, increased workload and the insufficiency of human resources. However, concerning the workload, it has also been shown that after an initial increase in workload at the start of KMC implementation KMC reduces nurse's workload [15].

Others factors at KMC unit level that were specific to the country were the lack of collaboration between services in charge of newborn care, lack of space for more beds to perform continuous KMC and the lack of home visits. Regarding the lack of space for more beds, the consequences are that many newborns that are eligible for KMC can not benefit from the intervention due to lack of beds. To overcome this hindrance an advocacy lead by the KMC unit is ongoing to obtain the construction of a larger building with a capacity of 40 beds within the CHUT. For the lack of collaboration between services in charge of newborn care, multidisciplinary meetings should be promoted and organized at hospital level. In a study conducted in United States, weekly multidisciplinary meetings to coordinate and provide continuity of care for medically complex neonates in a NICU was associated with improved patient outcomes [25]. As for the lack of home visit, this is the consequence of the insufficiency of human resources of staff. Once discharged, the follow up of the dyad in the community is very complicated. Therefore it is important for the KMC unit to involve and work together with community health workers such as the breastfeeding support association.

Indeed facility-based KMC services should incorporate a community sensitization component with their programs and explore innovative ways to link with community-based health initiatives[25]. Community support for mothers practicing

KMC, has been identified as a weak link in current programs [22] therefore there is a need to strengthen this weakness and create awareness at community level.

Besides the lack of community awareness, the beliefs of carrying babies on the chest instead of the back was reported in some communities as a barrier at mother/family/community level, this result was similar to those found in Ghana and Malawi where it seemed strange to place the baby on the front as instructed by KMC [12, 15].

One unique barrier in the country to KMC implementation at mothers/family/community level was the low rate of exclusive breastfeeding among mothers admitted in the KMC unit. Exclusive breastfeeding is a central pillar of KMC not only for its nutritional benefits, but also for the connection that it builds. However, in the current context of CHUT, where the maternity ward is undergoing rehabilitation, the majority of children are referred from other health facilities and early breastfeeding is not always done at birth. The delay in transfer and the stress of hospitalization could partly explain this low breastfeeding rate. Therefore it is important for the medical staff of the KMC unit to educate and encourage mother to adopt exclusive breastfeeding and the health facilities that refers newborn to initiate early breastfeeding and skin to skin contact during transfer.

Another unique barrier to the country is partner resistance to KMC. Besides community awareness, peer support from other mothers or fathers through sharing their kangaroo mother care experiences could help promote acceptance among partners [15].

Concerning facilitators to KMC implementation, those identified at KMC unit and mothers/families/community levels in our study are consistent with studies [10, 11, 21, 23]. Those facilitators were training of healthcare providers, the value of the intervention for healthcare providers, leadership, the cost of the intervention, mothers-healthcare providers relationship and mothers' adherence to KMC. None facilitator unique to the country have been identified.

However to improve the implementation of KMC, healthcare providers have proposed some solution such as the motivation of the volunteer staff, intensify mothers and family education and counseling the involvement of all stakeholders, the recruitment of a psychologist.

Regarding volunteer staff, even though to be a volunteer is to participate willingly in the life of the association without financial compensation, volunteers usually contribute to the greater good as long as they feel they are making a meaningful contribution [26]. However, in a context where there is an insufficiency in human resources, motivate volunteer staff could help to retain them and ensure the continuity of care. The challenge is to find the better way to motivate them. Even though in our study, healthcare providers proposed to give financial incentives, some studies demonstrated that the amount given may impact the work of the volunteer. Indeed, a study showed that giving small money to volunteers does not help and impact negatively their work, on the other hand when volunteers in the same experiment were offered larger monetary rewards, hours they offered to work were high ; showing that in the absence of budget constraints, money may help to motivate volunteer staff [26, 27]. Another study indicated that a volunteer programme can meet needs and be a motivational force for both the individual volunteer and the organization. However, it requires co-ordination and some secure funding to remain sustainable [28].

Concerning the involvement of all stakeholders, the support from family members was documented in many studies and emerged as the top enabler of practice in sub-Saharan Africa [19, 23, 29, 30]. However, besides family support, government, implementers' partners should be involved in the rolling out of KMC.

As for intensifying mothers and families education and counseling on KMC, it is very important to devote more time on these activities. As KMC seems for some communities an unusual way of carrying the baby, it is fundamental for them to comprehend what it entails, as well as its benefits. Continued education of medical staff and parents is necessary [31] and

providing a better liaison with antenatal care services to endorse KMC could contribute to better preparation of caregivers and training of healthcare providers [32].

The recruitment of a psychologist in the unit was also cited as a solution to improve KMC implementation. The presence of a psychologist is important for the support of the mother and the family members because even if it was found that KMC can promote more positive parent-child interaction, it can also improve negative maternal mood (e.g., anxiety or depression) [33].

This study presented interesting results, but those results were limited by some factors. For instance, we acknowledge the possibility of social desirability bias from mothers when they participated in the interview. In order to minimize this bias, we conducted interview with mothers in a separate room and we used non-hospital staff as research members. We could present and validate the study findings with healthcare providers during a workshop. However we were not able to return to the participants to validate the study findings and this is also acknowledged as a limitation.

## Conclusion

KMC is a complex intervention and understand the context specific barriers and facilitator to its implementation allows the scaling-up of KMC to be tailored to the population and healthcare providers needs. Our study results revealed some unique barriers to KMC such as the lack of collaboration between services in charge of newborn, the lack of home visit, partner resistance, and the low rate of exclusive breastfeeding. The study also allows proposing solution to improve KMC implementation. Understanding the challenges to implement KMC at health system and community level and the interactions between these different levels provides recommendations for a better implementation and scaling up of this intervention. Further researches notably randomized trials are needed to test strategies that address the barriers and support facilitators in order to improve the rolling out of KMC.

## List Of Abbreviations

CHUT: Teaching hospital of Treichville

HP: Healthcare provider

KMC: Kangaroo Mother Care

M: mothers

NICU: Neonatal Intensive Care Unit

WHO: World Health Organization

## Declarations

### *Ethical approval and consent to participate*

The research protocol was submitted and obtained ethics approval from the national ethic review committee Cote d'Ivoire (reference number 125-20/MSHP/CNESVS-kp). A written informed consent was obtained from all participants in the study. Participation was voluntary and participants were informed of their right to withdraw from the study when they wished to do so. Data were collected, managed and analyzed in a way to ensure the confidentiality of study participants. All procedures performed in this study involving human participants were in accordance with the ethical standards of the national ethic review committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

### ***Consent for publication***

Not applicable

### ***Availability of data and materials***

The data presented in this study are from the Project « *Documentation of Kangaroo Mother Care Implementation in the Neonatal Intensive Care Unit of the Pediatric Services of the Teaching Hospital of Treichville* » conducted in Cote d'Ivoire. Access will be granted from the corresponding author on reasonable request, only after careful and due consideration of the compliance with the ethics requirements, the data policy of the Cellule de Recherche en Santé de la Reproduction».

### ***Competing interests***

The authors declare no competing of interest

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### ***Authors' contributions***

KRK, DD, MLAY, LC and CSM designed the study. KRK and DD analyzed the data. KRK proposed the first draft of the paper. The other authors JO, ATK, VKK were involved with the previous authors in revising and contributing to the successive drafts. The final version of the paper was revised and approved by all the authors.

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