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Original Research Article

Barriers to the use of kangaroo mother care in mothers of low-birth-weight infants in Madagascar

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ABSTRACT

Background: Worldwide, complications of preterm birth and low birth weight are the leading cause of death among newborns and so were in Madagascar. Kangaroo mother care (KMC) is an essential neonatal health intervention to reduce mortality and morbidity in preterm infants. Despite this, mothers face several obstacles in its daily practice. The objective of our study was to identify the barriers that oppose mother's adherence to KMC in order to seek solutions.
Methods: This was a descriptive cross-sectional study including low birth weight infants whose parents have refused or abandoned the practice of KMC. We conducted an interview either face-to-face or by phone call with open-ended and then semi- structured questions.
Results: Among 444 low birth weight (LBW) newborns who should be admitted to the kangaroo unit: fifty-seven (12%) did not receive or abandoned KMC during hospitalization. Fourteen infants whose mothers answered the phone call no longer returned to outpatient follow-up. We retained 71 infants whose mothers did not fully adhere to the KMC stages. Financial barriers were the main obstacles, especially transport costs n=47 (66.2%); then parental and family barriers, in particular family organization in relation to household chores n=26 (36.7%); including hospital barriers especially geographical distance from the hospital n=25 (35.2%).
Conclusions: To improve mothers' access and promote the health of premature infants, social assistance: such as transport support, provision of medical insurance, meals, home visits and intervention of psychologists are necessary.

Keywords: Barrier, Kangaroo mother care, Low birth weight, Madagascar, Premature

INTRODUCTION

In total, more than 5.0 million children under age 5, including 2.3 million newborns died in 2021 worldwide. The global neonatal mortality rate (NMR) in 2021 was 18 deaths per 1,000 live births. Regionally, sub-Saharan Africa had the highest NMR in the world at 27 deaths per 1,000 live births. In Madagascar neonatal mortality rates is 24.1 per 1000 birth in 2021.[1] Worldwide, complications of preterm birth and low birth weight are the leading cause of death among newborns.[2] Likewise, in Madagascar complications of preterm birth represent the leading cause of neonatal deaths (38%).[3]

Effective interventions that improve the survival of premature or /and low birth weight is needed. Kangaroo Mother Care (KMC) is one of these crucial interventions. KMC is recommended by the World Health Organization (WHO) as a standard for the care of preterm newborns.[4] WHO describe KMC as an effectual method which consists of early, continuous and prolonged skin-to-skin contact between mother and baby; ideally exclusive breastfeeding;

initiated in hospital and continued at home; early discharge from hospital; and adequate follow-up at home.[5] Many scientific studies have demonstrated its effectiveness and benefits in reducing the risk of mortality and severe infection/sepsis, promoting infant growth, and positive breastfeeding outcomes.[6-12] In addition, KMC reduces duration of hospital stay.[13-15] And also, it promises a better outcome in term of psychomotor development and long lasting social and behavioral protective effects.[16-21] It is a key intervention in newborn health.[22]

Despite these strong evidences of KMC there are many obstacles to its implementation. A systematic review explores the barriers and enablers of KMC implementation specifically from the perspective of health systems, with a focus on healthcare workers and health facilities.[23] Another one relates barriers and enablers on caregiver's perspectives.[24] Other studies describe factors that influence the use of KMC by parents of low birth weight.[25,26]

Although KMC is an easy-to-use method, parents especially mothers face several problems while practicing KMC. In Madagascar, in hospital we have never studied the frequency of dropouts from KMC or why mothers do not adhere to the practice.

The aim of this study was to identify barriers that oppose mother's adherence to KMC in order to seek solutions.

METHODS

Setting and sample

This study took place in the kangaroo unit at the Gynecologic and Obstetric University Hospital of Befelatanana in Antananarivo, Madagascar. The kangaroo unit include three stages, the first one is intra-hospital kangaroo adaptation. the second phase is mother-child kangaroo hospitalization. The third and last phase is the ambulatory kangaroo mother program or outpatient follow-up.

The study included mothers of preterm or low birth weight infants who did not fully adhere to the different phases of KMC. Either they did not agree to practice KMC from the proposal in the NCIU, or they abandoned KMC during the intra-hospital kangaroo adaptation phase or during the mother-child kangaroo hospitalization phase, or they had no longer returned to the ambulatory kangaroo mother program. The interviews were conducted with 71 mothers. The study last thirteen months from March 2021 to March 2022.

Study procedures and data collection

This was a cross-sectional descriptive study. When the mothers did not adhere to the practice of the KMC or abandoned it during its intra-hospital realization; a direct interview was conducted. For those who dropped out of the outpatient follow-up phase, the interview was conducted by phone call. Conditions before interviews is that mothers received information about the study and willing to be interviewed. Interviews included first open-ended questions and then semi- structured questions.

A part from questions about barriers to KMC, mothers were also asked about social and demographic questions, in order to obtain the necessary contexts to the findings. Data on infant characteristics and another data on mother characteristics were obtained from the infants' medical records.

Data management and analysis

The mothers' responses to the interviews were recorded as they were on paper. Apart from this, a questionnaire sheet for data collection was prepared. This sheet contains mother's socio-demographic data as well as the classification of the barriers grouped by: cultural, parental and family, hospital, financial and other barriers. At the end of the interview, the mothers' answers were transcribed on the questionnaire sheet according to their classification. Data were entered into Excel and analysed using IBM SPSS statistics 20 software.

RESULTS

Among the 444 low birth weight (LBW) newborns during the study period who should be admitted to the kangaroo unit, 71 (12%) had their mothers who refused or abandoned the practice of KMC. Eight mothers (11.3%) refused the proposal to practice KMC for their infant. Forty-nine mothers (69%) abandoned the practice of intra-hospital KMC. Fourteen mothers (19.7%) whose answered our phone call had no longer returned to the ambulatory kangaroo mother program. Sixty mothers (84.5%) were between 18 and 35 years old. More than half (64.8%) had secondary education, just over half (53.3%) were unemployed (Table 1).

Newborns were premature in 67.7% of cases with a birth weight between 1500g to 1999g in 57.7% of cases (Table 2).

The etiologies of low birth weight are represented in Figure 1.

The first barriers in these findings were financial barriers (Figure 2).

Transport costs were a problem cited by 66.1% of the mothers. In maternal socio-demographic characteristics (Table 1): 43.6% of mothers come from out of town.

Table 1: Maternal socio-demographic characteristics (n=71).

Characteristics	N (%)
Age (years)	
<18	4 (5.6)
18-35	60 (84.5)
>35	7 (9.9)
Marital status	
In couple	63 (88.7)
Single	8 (11.3)
Education	
Illiterate	1 (1.4)
Primary	13 (18.3)
Secondary	46 (64.8)
University	11 (15.5)
Occupation	
Unemployed	38 (53.3)
Informal	19 (26.8)
Employed	13 (18.5)
Geographical location	
Out town	31 (43.6)
In town	40 (56.3)

Table 2: Neonatal characteristics (n=71).

Characteristics	N (%)
Gender	
Male	34 (47.9)
Female	37 (52.1)
Term	
Premature	48 (67.6)
At term	23 (32.4)
Gestational age (GA)	
<28	2 (2.8)
28-29	10 (14.1)
30-32	20 (28.2)
33-35	21 (29.6)
36	6 (8.5)
≥37	12 (16.9)
Birth weight (grams)	
1000-1449	20 (28.2)
1500-1999	41 (57.7)
2000-2499	10 (14.1)
Weight at discharge (grams)	
1000-1449	20 (28.2)
1500-1700	25 (35.2)
1701-1999	21 (29.6)
2000-2499	5 (7)
Hospital stay (days)	
≤5	21 (29.6)
6-14	33 (46.5)
15-30	10 (14.1)
>30	7 (9.9)

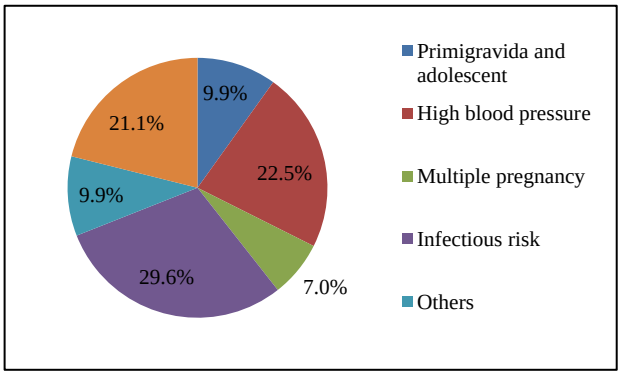

Figure 1: Etiologies of low birth weight (n=71).

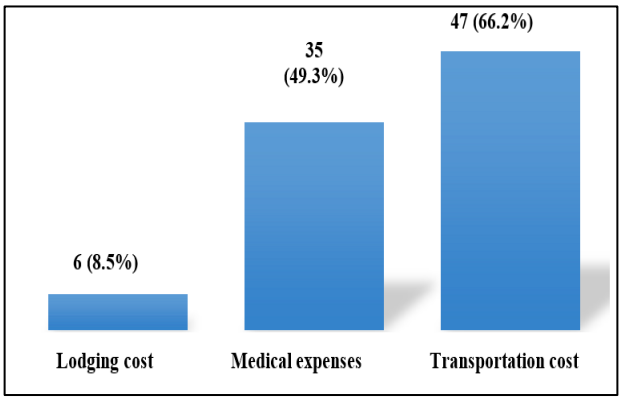

Figure 2: Financial barrier (n=71).

The second group of barriers to KMC was the parental and family barrier (Figure 3).

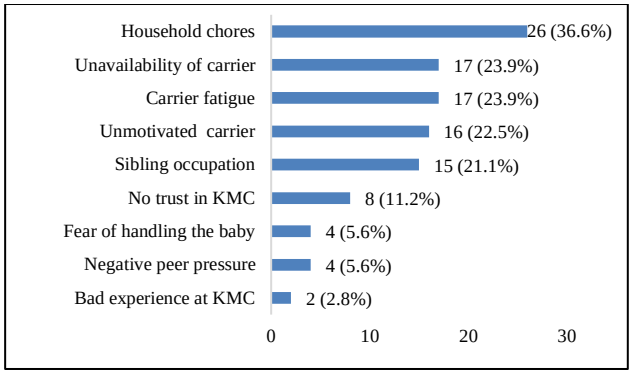

Figure 3: Parental and family barrier (n=71).

The first issue mentioned by mothers was household chores awaiting then at home (36.6%).

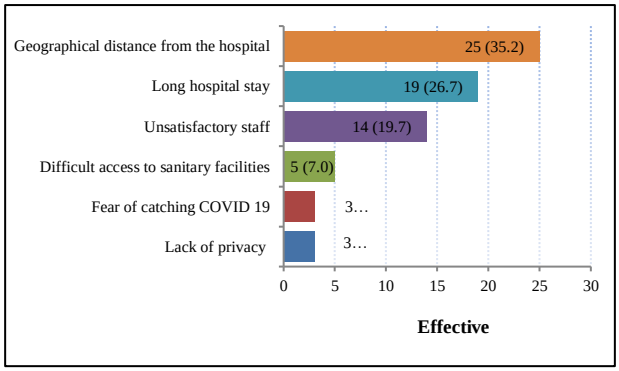

Figure 4: Hospital barriers (n=71).

The third group of barriers to KMC were hospital barriers (Figure 4) with first geographical distance from the hospital (35.2%).

DISCUSSION

In the present study, the main obstacle that mothers face in KMC implementation is the lack of financial means. Transport costs were a major problem mentioned by the mothers (66.1%). This issue concerns not only mothers whose infants were still in the intra-hospital kangaroo adaptation phase but also in mother-child kangaroo hospitalization phase and during outpatient follow-up visits in the ambulatory kangaroo mother program phase. Mothers or family of kangaroo infant have to travel back and forth between hospital and home. Transport cost was heavy for the parents because the majority was in low socio-economic level: 53.3% of mothers were unemployed.

Half of the mothers (49.2%) also complained about the medical expenses and mentioned it as an obstacle. In our context, as the hospital is a referral center, many mothers were referred from another health facility because they were sick or had obstetric complications. We can see in Figure 1 the etiologies of preterm and/or low birth weight births. Therefore, the family said that they had already spent a lot of money to treat the mother and so, they haven't no more money to buy medicine for their child.

The lodging cost is also part of the financial barriers in (8.4%) of mothers who live very far away and have to rent a house to stay near the hospital.

These findings are similar with those of the literature: a systematic review by Seidman et al reported that financial barriers rank first among barriers to KMC. Of the top five barriers to KMC practice cited by mothers, four were resource-related.[22]

In previous studies conducted in low-income countries, commuting between home and KMC wards is a barrier of KMC implementation. In Indonesia and in China: lack of money for transportation and distance to the hospital, room accommodation costs were reported as issues to KMC practice.[27,28]

In United States, parents were very concerned about access to accommodation close to the NICU, despite a discount granted by the hospital. For others, because of the distance from the hospital, costs of car and train travel to get there was identified as a financial problem as it was considered onerous, although gas cards provided by the hospital alleviated some of this burden.[29]

In our case, transportation costs, all drug costs (except emergency drugs), mothers' meals or its substitute are the responsibility of the families; which represents a heavy burden for them,especially since the majority of families are of low socio-economic level. In our hospital, meals can be provided only for those most in need.

From these findings, we suggest to provide transport support for families and mother performing intermittent KMC in hospital, and those were already discharged and have to return regularly to follow-up visits. It is also necessary to advocate for an increase in state subsidies to strengthen the social assistance system and provide meals to all mothers so that they can stay in hospital with their infants for as long as necessary. The establishment of medical insurance is also necessary to reduce the burden of parents.

Regarding the second group of barriers to the KMC, parental and family barriers rank second in this result, whereas in other studies, they are ranked fourth and fifth.[26,27,30-32]

The most frequent obstacle in this second group is household chores (36.6%). As we have seen that 53.3% of mothers are housewives. So, when they stay in the hospital to carry their premature baby in skin-to-skin contact or when they return to the hospital for outpatient follow-up, no one can take care of their household chores at home. The majority of families are poor and don't have a washing machine or a stove, but it is the mothers themselves who do all the household chores.

In the literature, the obstacle of household chores is less frequent: some parents felt divided between family life at home (housework) and the time they want to spend in the hospital.[26] This difference in results can be explained by the difference in standard of living. We suggest setting up home visits with social workers to help the family to organize the sharing of household chores. For those who come to the hospital during outpatient follow-up visits, transport should be provided to help mothers to save time so that they have time to do their household chores. The creation of an individual family room in the hospital where the family can live until the baby discharge; could also be a solution to this issue.

Carrier fatigue belongs in the group of parental and family barriers. It was cited in 23.9% of cases. It has also been widely reported in other studies.[24,33,34] Back pain from continuous positioning the infant on the chest, tiredness, boredom, were shared during the practice.[35] Carrier's fatigue could come from the fact that it is only women who carry babies in the kangaroo position and that they cannot be replaced by men. Indeed, our kangaroo mother hospitalization room is a common room with 6 beds, without bathroom or room to dress. To overcome this problem, we suggest the creation of individual rooms to allowthe participation of fathers in order to avoid fatigue for mothers and carriers.

The unavailability of the carrier is an obstacle as frequent as carrier fatigue in our study (23.9%). The carrier is woman who replace the mother when he had just had a caesarean section or when she is still sick. Often the family cannot find a woman to substitute the mother or she is not available for all the time it takes. According to a systematic review by Seidman et al, maternal medical problems were a major barrier to KMC practice.[22] These medical issues included pain from episiotomy repair, recovery from caesarean section, postpartum depression, and general maternal illness.

Carriers who are not motivated to perform KMC (22.5%) comes with the problem of the mother's unavailability to practice KMC in present study. It was difficult for the surrogate to stay full time in the hospital. However, in other studies, we did not find this problem.[22]

Sibling occupation was mentioned by fifteen mothers. They said they also have to take care of their other children at home because no one else can do it. This is also a barrier reported in previous studies, many parents spoke of the difficulty of balancing time in the NICU with their obligations to their other children who stayed at home but also need their attention and companionship.[26,27,30]

Home visiting system should be done to help the family organize themselves and sensitize other family members to do childcare and household chores. Policy makers and agencies should be involved in improving the hospital structure operating the KMC, by creating night life spaces for families.

In the present study: eight mothers answered that they did not trust the KMC. One of them said: "*My baby is losing weight despite the KMC*". Two others had negative experiences while performing KMC. One neonate became pale, exhibited fast breathing, and poor sucking and the other mother had her previous baby kangaroo who became cyanotic. These findings about no trust KMC and bad lived experience were also reported by other authors: Mathias et al and Blomqvist et al.[26,36]

In our findings, four mothers were afraid to handle the baby because they thought that: the baby would choke or feel unwell in the kangaroo position. Similarly, authors in Sweden and in India reported that fear of handling small infants and fear that the infant would stop breathing during KMC was also a reason for decreasing KMC practice.[26,37] According to these results, we suggest to reinforce the parent's training and that the intervention of psychologists to morally support the mothers are essential.

In this study, four mothers had suffered negative peer pressure from either the father or grandmother regarding money problems, household chores and fatigue.

In southern Ethiopia, the negative pressure can come from the father, male dominance in a patriarchal society may influence mother's acceptance and practice of KMC.[38]

Unlike, according to the systematic review conducted by Seidman et al: "support from family, friends, and other mothers was the top enabler of practice in LMIC (low- and middle-income countries) across publications". This support took many different forms: holding the infant in KMC, childcare and housekeeping, emotional support whose is a crucial enabler to practice.[27]

We suggest that family members need to be more aware of KMC during the admission so that they could support mothers and become enablers to practice. To do this, the staff should be strengthened in number.

In the present study, no cultural barrier was found. Contrary in other studies, in China: "specific cultural barriers were found as the practice of postpartum confinement and resistance to KMC from grandparents and community members rooted in tradition".[28] A systematic review conducted by Kinshella et al reported that family attitudes and culture beliefs that babies should be carried on the back instead of in front, guilt over the premature birth and lack of motivation due to the thought that premature could not survive, were also frequently mentioned.[34]

About hospital barrier group, in the present study, the geographical distance from the hospital comes first (35.2%). This obstacle concerns both mothers who are still in the hospital with their infant; and those who have already been discharged and are returning to outpatient follow-up. Family members of those still in hospital have

to come and go to bring meals and dirty laundry. It requires additional expenses for transport costs.

Similarly, authors in previous study narrate that mother also reported difficulty with the distance to the NICU. They were transferred from a community hospital to this large referralhospital because of the risk of their pregnancy. The long distance and the cost of parking were considered heavy charges.[29]

We suggest that transport of families whose help mothers practicing KMC in the hospital; should be provides and also, for mothers and infants followed on Ambulatory mother kangaroo program so that they can be monitored until the end of their follow-up.

The second type of hospital barrier found in this study was the long hospital stay (267%). Almost half (46.5%) of the newborns stayed for 6 to 14 days in the hospital because 57.7% were very low birth weight (1500 gm at 1999 gm).

Reviews have indicated that the increase of KMC abscond is associated with fatigue, boredom and long stay in hospital.[25]

This fact could be explained in our case that the parents could no longer overcome the financial problem which has already been detailed above. Consequently, they ask to be discharged from the hospital. Apart from looking for solutions to lighten the financial burden of families, the protocol for the care of low-birth-weight newborns could be revised by including the practice of immediate KMC and by organizing all the organizational changes that it requires. When the KMC is started as early as possible, premature will recover quickly and will be released sooner. Ground breaking research proves that immediate KMC reduces sepsis and dramatically increases the chance of survival in LBWs.[39,40]

Another type of hospital barrier was noted: the staff were qualified as unsatisfactory in 19.7% of the cases because they were qualified as severe or did not explain well during the mother's training. Our finding is consistent with the finds by Seidman et al in a systematic review study that found "negative impressions of staff attitudes or interactions with staff".[11] Another study also cited that mothers perceived that the attitude of NICU staff and behavior in the infant care space making noise could impede KMC.[15]

The difficulty of access to sanitary facilities was mentioned by mothers 7% of mothers. Toilets and the bathroom which are close to the kangaroo room are not functional and the mothers have to go far to other services for their needs. The repair of sanitary facilities should be prioritized to improve the comfort of mothers caring for their premature infants who are fragile. The second barrier related to the hospital environment is the lack of privacy in the kangaroo mother-child hospitalization room,since this room is a common room. Consistent with this result, other studies have reported that there was a lack of privacy spaces and separate KMC ward for mothers and fathers.[11,17,26,27]

Hospital logistics should be improved by creating individual KMC rooms with included sanitary facilities.

The fear of catching the corona virus was specific to our study, as our study took place during the COVID 19 epidemic. For this reason, some families have done "self-discharge" and some who haven't returned to the ambulatory kangaroo mother program have declared this cause.

CONCLUSION

Results and success of KMC on the reduction of mortality and morbidity on premature and/or low birth weight depend not only on the implementation of services but also on awareness of the barriers encountered by KMC practitioners, with the aim of seeking solutions to overcome the obstacles that hinder the accessibility and use of KMC. Key challenges in our findings primarily include the lack of financial means for family transportation and medical expenses. Secondly, other challenges are the issue of family organizations including household chores, unavailability and fatigue of the carrier, occupation of siblings. Finally, the most frequent problem in hospital barrier is geographical distance from the hospital. All health actors within the hospital system, policy makers, institutions and social workers will need to work together to find solutions to barriers and promote KMC. We suggest that meals should be provided for mothers. Other solutions should be essentials: establishment of medical insurance, setting up home visits, transport for mothers, intervention of psychologists to morally support the mothers. Additional larger-scale research including enablers and barriers to KMC practice; not only among mothers but also in family members, as well as health workers; are needed to assess the acceptability and establish strategies for scaling up KMC to reduce neonatal mortality.

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