



Research Article

Enablers and Barriers to Kangaroo Mother Care in Decentralized African District

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Abstract

Background: Since its creation in the 1970s, Kangaroo Mother Care (KMC) has proven many benefits, particularly in reducing mortality of premature or LBW new-borns in low resources settings. Unfortunately, its expansion, especially in Africa, remains insufficient. A KMC project set up over 2 years in the district hospital of Bonassama in Cameroon with a grant of the Geneva University Hospitals (HUG). After more than five years, its sustainability remained uncertain without external funds. We therefore thought to determine enablers and barriers to KMC in this health structure of a low resources African district.

Method: Qualitative research by semi-structured interviews with 22 families and 6 caregivers who directly participated in the KMC program. Data analysis was based on a pre-established evaluation grid.

Results: The main barriers to KMC parents were communitarian, based on prejudice against prematurity and LBW, direct costs for families, and lack of knowledge on KMC, causing fear, stress, and anxiety.

Main issues for relatives were distrust and prejudice towards health structures in general.

Teaching and learning about KMC appeared as a decisive factor towards its application and continuation at home. Once practiced, KMC parents became deeply convinced of its benefits.

Conclusions: As the community appears reluctant to KMC, but participating parents become advocates of the method, their implication in public sensitization may present a first step in forgoing these barriers. However, campaigns need to target knowledge on prematurity and LBW at least as much as KMC. Increased knowledge and training of caregivers involved in ante- and perinatal care are clearly essential.

Making KMC part of free government basic new-born care will reduce direct costs and is likely to improve health structure reputation of practicing centers. Nevertheless, indirect financial burden, such as travel cost and loss of income, remain the highest for the most remotely living and poor parents.

Introduction

Prematurity and low birthweight (LBW) is considered the first cause of mortality in new-borns worldwide [1]. Fifteen million premature births occur each year [2], of which one million die due to its complications [3]. The WHO's seven recommendations to improve survival and health of new-borns recommend Kangaroo Mother Care (KMC) for premature or LBW new-borns since 2015 [4]. KMC was developed in the 1970s due to a lack of incubators [5]. It has showed improved survival and neurocognitive outcome [5-7].

Today, broadly supported by WHO, UNICEF and large NGOs, KMC is recommended for basic neonatal care based on its positive cost-benefit balance. However, expansion of KMC, particularly in sub-Saharan Africa, remains low. Since 60% of the world's prematurity occurs in sub-Saharan Africa and South Asia [1], it is essential to understand barriers to KMC, its sustainability and expansion, specifically in these regions.

A systematic review of enablers and barriers to KMC [8] identified the days spent in hospital practicing the method, social and medical support, family acceptance and organization, and finally financing and performance of the health structures as supporting elements. According to this review including 29 studies with 9 from the African continent, the adoption of KMC was predominantly influenced by cultural norms and perceptions. Mothers played a central role in acceptance or refusal of KMC, strongly influenced by family stigmatization and pressure, lack of willingness, tiredness, and post-partum depression [9]. Only three studies concerned rural settings or decentralized structures [10,11]. As KMC may be most relevant to such decentralized healthcare facilities of lower level, understanding their enablers and barriers appears essential.

Descriptive data of a small neonatal unit in a decentralized sub-urban district hospital of Bonassama in Cameroon showed the highest association of mortality with hypothermia [12] and led subsequently to the development of a KMC program supported by a 2-year cooperation fund from the University Hospitals of Geneva.

Method

Objectives

The aim was to understand enablers and barriers to KMC and its sustainability in a decentralized sub-Saharan healthcare structure. We collected the experience of caregivers and families who were directly involved in the KMC program, to uncover critical barriers and infer levers for autonomy, propagation, and

sustainability of KMC.

Study type

Qualitative observational study through semi-structured interviews.

Population

We included KMC families and healthcare staff. Inclusion criteria for families were personal experience in continuous KMC, the possibility of contact for the interview, and an informed signed consent. Travel fees to the interview site were provided (3.6 U\$). Inclusion criteria for healthcare staff was direct experience in KMC support and follow-up of at least 10 mother-child dyads.

Setting

Interviews were conducted at the District Hospital of Bonassama by the two primary authors (LM, KB) of the Geneva University (Switzerland) with training and supervision of two senior neonatologist (DKK, REP).

Bonassama is a suburban, decentralized, low resources district of the port city of Douala. Its district hospital possesses a small neonatology unit, which is the only one in the district. It provides care for a large radius, with some requiring up to 4 hours travel time. Sanitation was rudimentary with only cold running water. Paediatric patients and parents were not provided food during hospitalization. Hospitalization fees in the unit were about 15 U\$/hospital day.

In late 2012, a three bedded KMC room was set up. For two years, all parents of low birthweight new-borns (< 2500g) were offered to practice KMC as soon as their baby was considered stable. Upon acceptance they received two Lycra® pouches for carrying and in-hospital support through a dedicated paediatrician or KMC-nurse. Participants practiced KMC on average 18 hours per day. Parents were encouraged to pursue KMC at home. At least one home visit by the KMC-nurse was provided. Regular follow-up for weight, height and immunization were also offered.

Ethics Consent

The Kangaroo Mother Care project at Bonassama, including its evaluation, was approved in 2012 by the Ethics Committee of Cameroon. The hospital direction of Bonassama gave written consent for the evaluation and each interviewee gave informed written consent for the interview. Analyses were anonymous.

Interviews

A qualitative semi-structured questionnaire (see additional material) was composed around seven themes (demography,

meeting with KMC, learning and teaching KMC, experience of continuous KMC, KMC practice at home, barriers to KMC, future of KMC) based on a literature review. The same interview structure was used for parents and caregivers to gain opposing perspectives. Interviews were performed jointly by two investigators (LM, KB): one interviewed, and the second transcribed. Roles were regularly inverted. All interviews were digitally recorded with permission.

Analysis

After each interview, responses were analysed and questions adapted in two steps to anticipate the following interview, using a pre-established evaluation grid, according to the recommendation for qualitative research [13-16]. Briefly, this consisted in classifying pre-defined answers into the seven topics on a Likert scale from 1 to 5 according to the relevance given by the interviewees. A grade 3 coded indifference, a grade 1 a strong negative and a grade 5 a strong positive impact. The questionnaire was then adapted through an interactive session to further explore the seven topics and uncover areas of interest not anticipated. Ten adjustments were made, and five new questions identified. Results were reported with box and whisker plots.

Results

Of the 134 families that practiced KMC, 55 met inclusion criteria and 22 (nineteen mothers, one father et two other family members) were available for the interview. One physician, three nurses, the pediatric head nurse and the dedicated KMC-nurse were also interviewed.

Mean interview duration was 30 (minimum 15; maximum 52) minutes. Mean maternal age was 29.4 years. Most mothers had a secondary level education (59%), lived in the district (81.8%), and were primiparous (54.5%). Mean gestational age of their new-borns was 35 weeks and mean birth weight of 1912 grams. Mean postnatal age at KMC start was 6 days and the mean total hospital stay 19 days. More detailed demographics are available in the supplements and results are reported in the following domains.

	Interview	Maternal age	Gestivity	Parity	Gestational age	Delivery	Birthweight (g)	Home in district	Education	Profession	Age at KMC start (d)	Hospital KMC duration (d)	Home KMC duration (d)
1	mother	35	5	5	41	V	2000	Yes	2	housewife	1	50	7
2	mother	21	2	2	31	V	2300	No	2	housewife	3	7	21
3	mother	29	3	1	35	V	2200	Yes	1	seamstress	5	28	14
4	mother	29	1	1	41	CS	2050	Yes	1	seamstress	2	31	14
5	mother	25	1	1	41	V	2100	Yes	2	seamstress	10	30	12
6	mother	28	1	1	39	V	2280	Yes	2	seamstress	1	30	25
7	mother	29	3	3	36	V	2100	Yes	2	pastry chef	1	31	14
8	mother	36	1	1	38	V	2000	Yes	3	computer	1	4	15
9	mother	34	3	4	36	V	1320	Yes	3	secretary	10	49	35
10	mother	25	1	1	37	CS	1750	Yes	2	student	3	32	17
11	mother	20	1	1	32	V	2090	Yes	1	housewife	5	20	0
12	mother	31	1	1	32	CS	1700	No	2	call boxer	7	14	0
13	mother	31	2	1	38	V	2000	Yes	2	salesperson	4	7	17
14	mother	23	1	1	35	V	2150	Yes	2	student	6	12	8
15	mother	27	1	1	31	V	2000	Yes	2	housewife	1	10	20
16	mother	34	2	2	32	CS	1490	Yes	1	salesperson	9	38	14
17	family	34	2	1	34	V	1900	Yes	2	salesperson	12	55	35
18	mother	29	2	2	30	V	1400	No	1	seamstress	15	52	23
19	father	33	3	2	32	V	1600	Yes	2	teacher	8	29	11
20	family	29	3	4	30	V	1800, 2000	No	1	housewife	17	66	28
21	mother	41	4	4	35	V	2250	Yes	2	housewife	4	8	0
22	mother	23	2	3	34	V	1600, 1800	Yes	1	housewife	4	13	0
	mean	29.4	2.0	2.0	35.0	CS : 4	1912	No : 4			6	28	15

Delivery : V = Vaginal delivery, CS = Caesarean section ; Education : 1 = Primary school, 2 = Secondary school, 3 = University degree

Demographics of Participating Mothers/Families

General knowledge and first contact with KMC (Figure 1)

Only two (9.1%) of the mothers/families had heard about KMC before the current pregnancy. Their most difficult experience was unanimously the first contact with prematurity or low birth weight, much more than KMC. All interviewees thought it necessary to receive information on KMC before giving birth. However, most recalled having understood and accepted the method when presented to them.

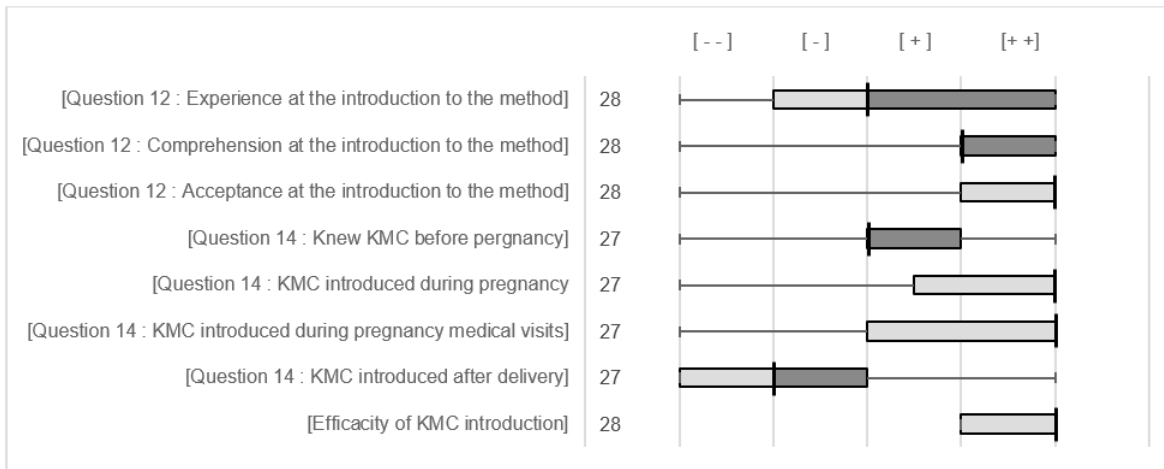


Figure 1: General knowledge and first contact with KMC. Summarized answers and number of responses on a Likert scale from 1 to 5 are reported with a box and whisker plot with median (dark line), upper (dark grey), and lower (light grey) quartiles, and extremes. A negative opinion will figure on the left, indifference in the center, and a positive opinion on the right.

Teaching/Learning KMC (Figure 2)

Directly learning the KMC practice from a dedicated KMC-nurse or paediatrician was considered optimal by all families. Caregivers reported the same perception. Healthcare staff had received a specific theoretical education, followed by applied training. KMC training itself was remembered very positively.

When asked how comfortable they were with the concepts of

KMC, families and caregivers felt capable and motivated to safely teach and pass on the KMC method. Half of the parents had already spread their knowledge to other parents in the community or within the health care facility and most families and caregivers (89.3%) had explained KMC to their relatives. Caregivers and parents felt it was important to broaden knowledge within the community and considered the knowledge transfer efficient, comprehensive, and with a positive long-term impact.

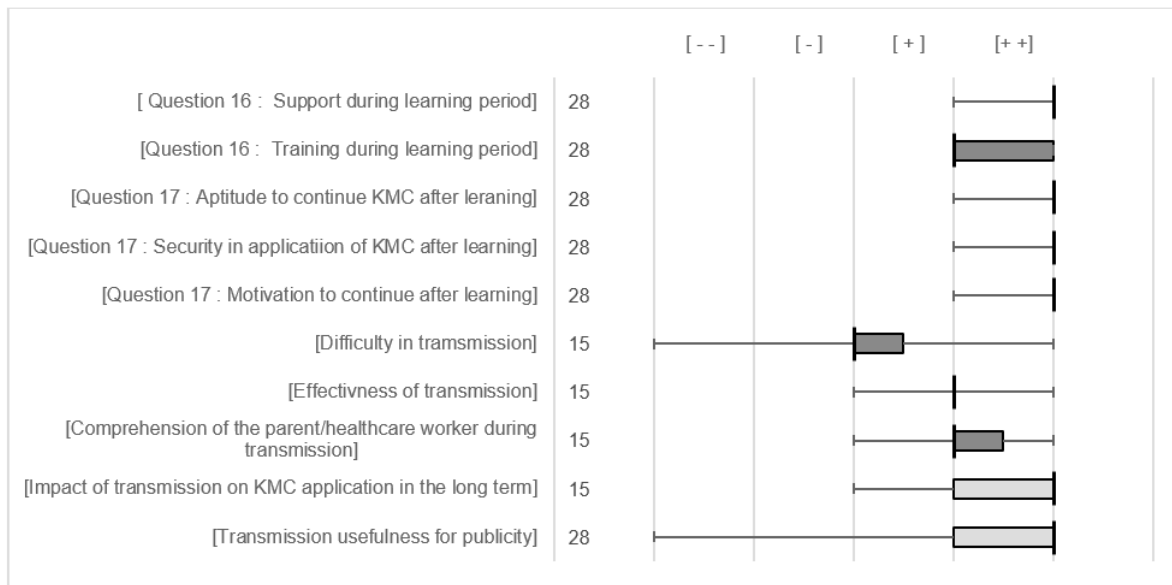


Figure 2: Learning and teaching KMC. Summarized answers and number of responses on a Likert scale from 1 to 5 are reported with a box and whisker plot with median (dark line), upper (dark grey), and lower (light grey) quartiles, and extremes. A negative opinion will figure on the left, indifference in the center, and a positive opinion on the right.

In-hospital KMC (Figure 3)

Particularly during early practice of KMC, mothers recalled a feeling of tiredness and stress. Despite the absence of distractions in hospital, boredom and solitude were not considered relevant. Support by caregivers and interaction with other KMC-families in the unit were appreciated. The general atmosphere within the unit was felt to be comforting due to the open discussions with caregivers. KMC-mothers received regular external visits, but very few had a second carrier to free some of their time.

All considered their participation in the KMC program as a personal choice without external constraints. For mothers and families, prematurity and LBW were the main source of anxiety and fear, but without feelings of shame or guilt. Anxiety and fear were mainly fueled by the community, family, and own prejudices. In the community, although KMC was perceived positively, hospitalization and prematurity were seen negatively. Concerning identification with the mostly unknown Australian kangaroo, neither mothers nor staff reported negative perceptions. For relatives, in-hospital KMC was complicated due to the prolonged absence of the mother from home.

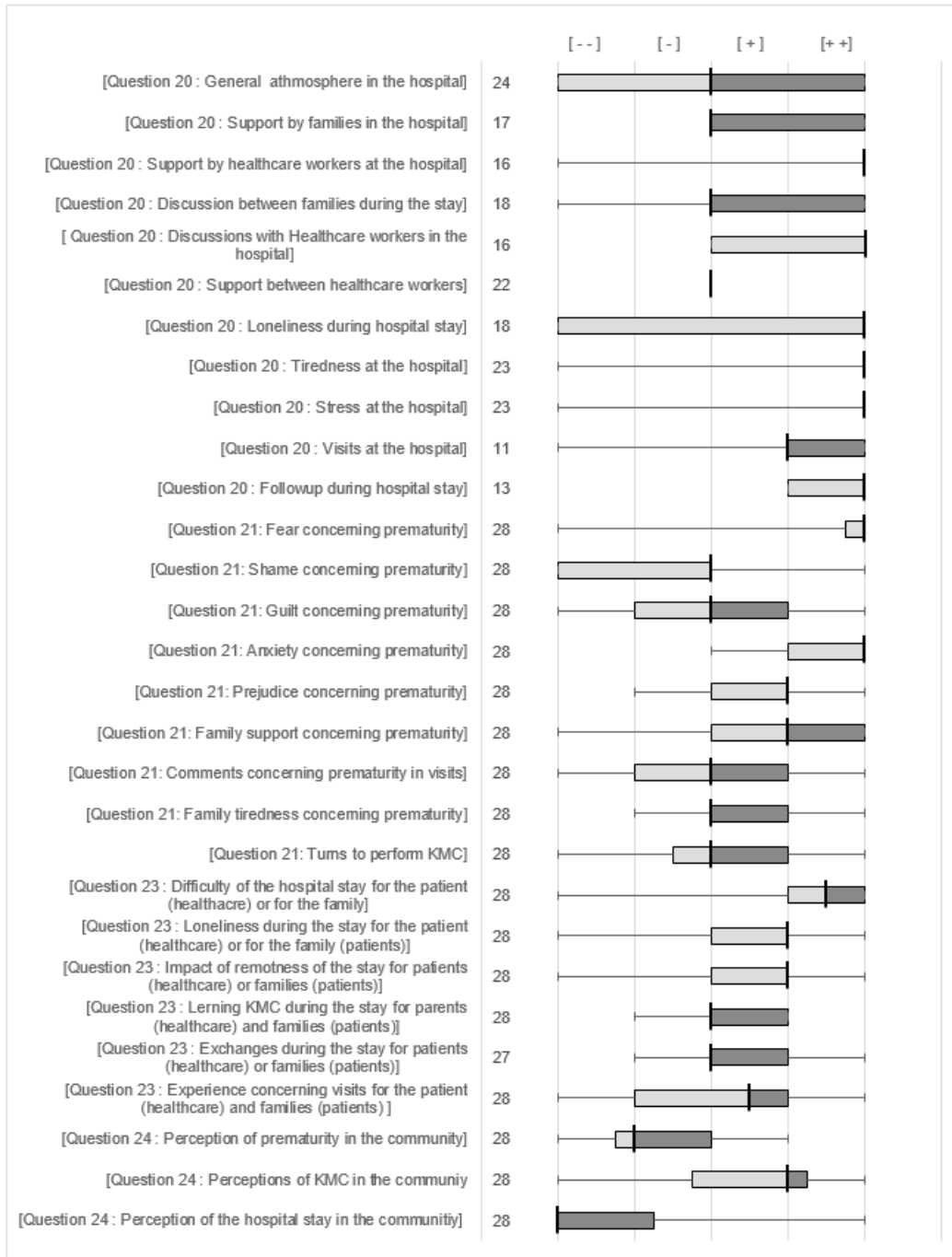


Figure 3: In-hospital experience of KMC. Summarized answers and number of responses on a Likert scale from 1 to 5 are reported with a box and whisker plot with median (dark line), upper (dark grey), and lower (light grey) quartiles, and extremes. A negative opinion will figure on the left, indifference in the center, and a positive opinion on the right.

Home-KMC (Figure 4, Question 11)

The principal reported maternal difficulty of home-KMC was tiredness, exacerbated by household work and the care of other siblings. Despite tiredness, interviewees reported that their good practical aptitude acquired in hospital made them feel confident and facilitated home-KMC. Returning home was remembered pleasantly and parents did not report excessive stress for too early or too late hospital dismissal. However, outpatient hospital follow-up was preferred to the home visit, by parents and caregivers alike.

Barriers to KMC (Figure 4)

Significant general barriers to KMC were, in order of reported relevance, (1) insufficient knowledge on KMC, (2) direct costs (hospital) and indirect costs (work interruption, travel costs) and (3) prejudice against KMC. However, KMC was not considered against local traditions and thought to find social acceptance in Cameroon.

For global logistical barriers to KMC, (1) transportation fees and equipment costs, (2) constraints arising from KMC such as fatigue from continuous carrying and heat discomfort, and (3) travel duration or distance from home to hospital were put forward. However, in personal matters, these barriers, including social pressure and duration of hospitalization, have not been retained as significant hindrances.

Carrying pouches and disposable diapers were two accessories unanimously considered essential for KMC, as reusable diapers reported uncomfortable by mothers. Although recommended by WHO [5] in certain temperatures, hats, socks, and open sleeveless shirt for the baby were not considered essential. The availability of these accessories was reported as complicated and stressful by caregivers only.

Direct hospital costs associated with KMC were considered a limiting factor by caregivers and parents. Caregivers only, strongly felt a negative financial impact of KMC on the healthcare facility.

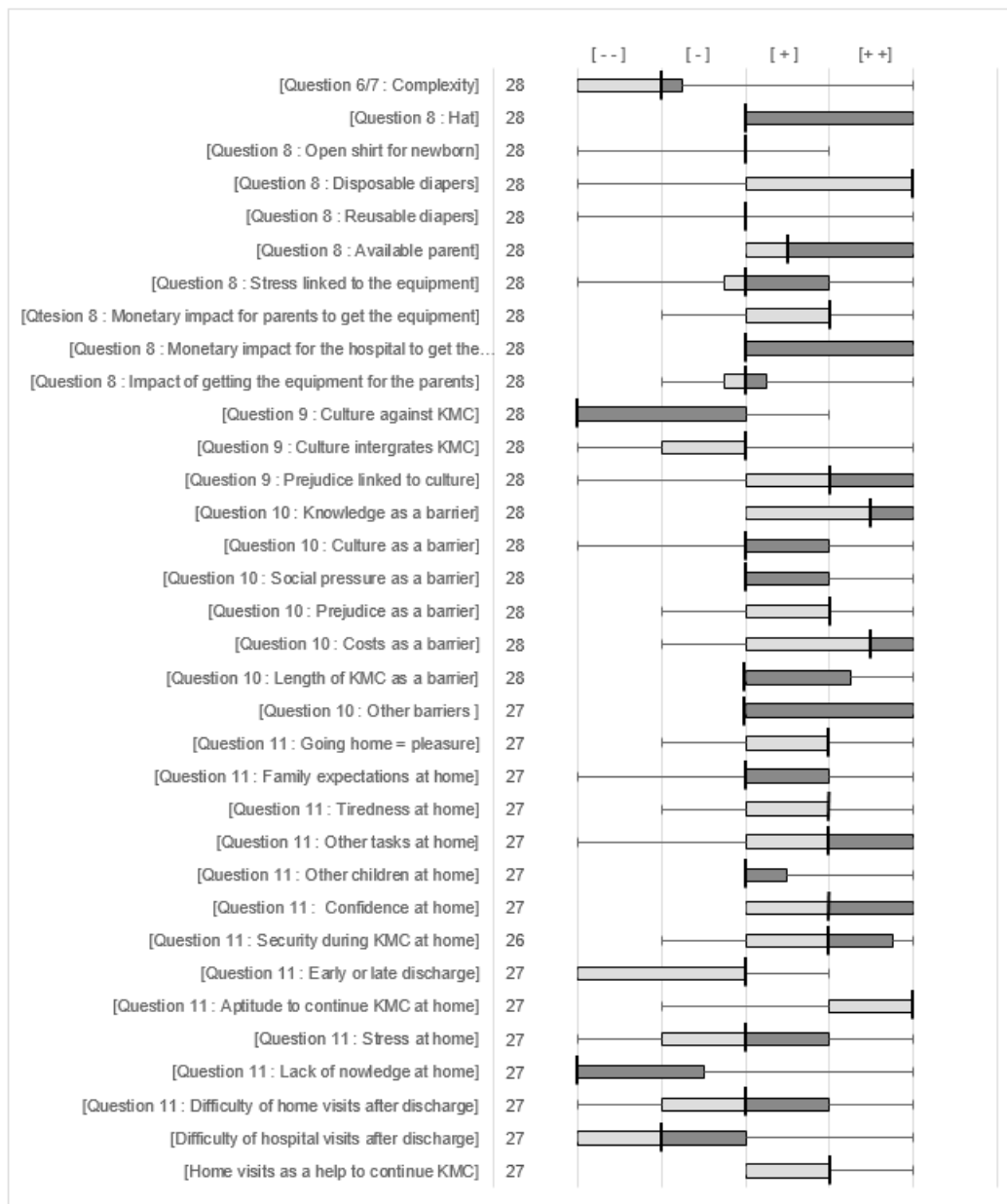


Figure 4: Barriers to KMC. Summarized answers and number of responses on a Likert scale from 1 to 5 are reported with a box and whisker plot with median (dark line), upper (dark grey), and lower (light grey) quartiles, and extremes. A negative opinion will figure on the left, indifference in the center, and a positive opinion on the right.

Sustainability of KMC (Figure 5)

Despite the high personal motivation put forward, caregivers expressed a low likelihood of KMC becoming autonomous and sustainable in their district hospital. The possibility for parents to pay off part of the direct hospital costs with some short-term handwork at the facility was welcomed by most parents, but frankly refused by caregivers.

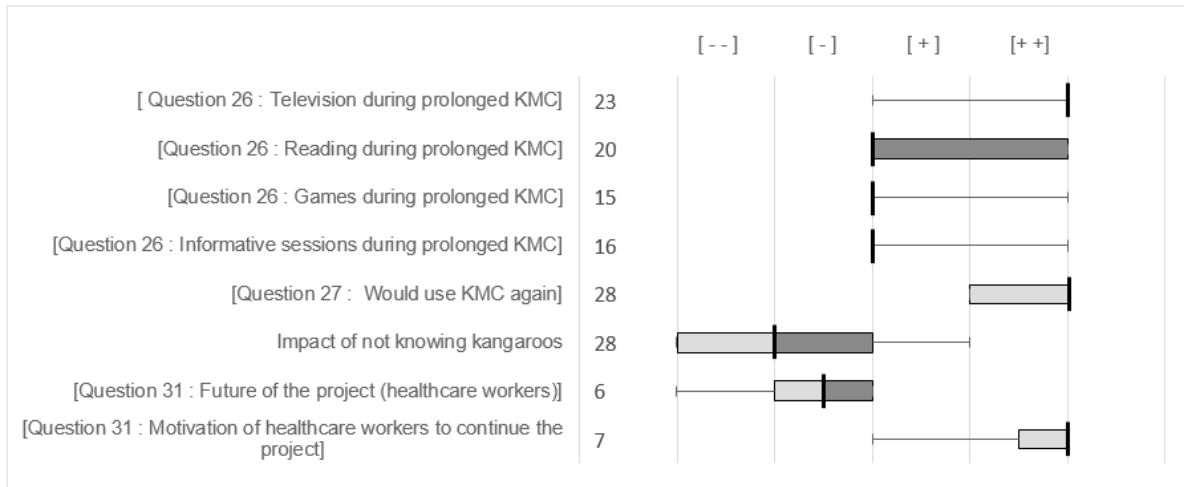


Figure 5: Sustainability of KMC. Summarized answers and number of responses on a Likert scale from 1 to 5 are reported with a box and whisker plot with median (dark line), upper (dark grey), and lower (light grey) quartiles, and extremes. A negative opinion will figure on the left, indifference in the center, and a positive opinion on the right.

Discussion

The discussion is structured according to the 7 interview sections followed by illustrating quotes.

Demography

It was easier to interview families than anticipated, contrasting with the difficulty to access caregivers, due to their lack of time, but also reluctance. We therefore feel the caregivers' answers should be interpreted carefully, but staff reluctance points to a main barrier.

Most of the 22 mothers were around thirty years old with secondary level education, and primiparous. We considered the high proportion of first-time mothers compared to the country's average a positive selection bias for KMC due to lower family duties, rather than just availability for interviews.

Only 34% of parents had accepted KMC. Despite comparable weight and pathologies, in-hospital mortality was considerably lower in the KMC (4%) compared to the standard care (18%) group [17]. It has not been possible to interview refusing families as contact details were not recorded in the KMC register for

confidentiality reasons, and parents still in hospital refused the interview. As all interviewees had surviving babies, a selection bias putting forward more optimistic views is likely.

First contact with KMC

The first contact with KMC was associated with negative emotions. However, parents were unable to distinctly separate these feelings from those associated with prematurity and LBW. Some form of parental education on these subjects appears essential. Information, Educations, Communication (IEC) is a common educational practice in Cameroon during hospital waiting periods, but prematurity and LBW are not covered, despite concerning up to 20% of new-borns [12]. In addition to public awareness campaigns, personnel involved in antenatal care need more education on KMC [18] to inform mothers at risk early. This may include a visit to the KMC unit or contact with KMC mothers.

QUOTES:

Mother #5 : [...] The main barrier is, according to me, that parents do not accept their babies and their realities. At the beginning, I had a lot of hardship myself. I cried a lot because I

did not know if my baby would survive [...]. The best is to inform mothers when they give birth, to prepare them for this eventuality, to be ready psychologically. [...]

Father #19 : [...] They must talk about that [prematurity] with mothers during pregnancy, saying that prematurity exists, that it is not a fatality, that there is hope. Women refuse the method [KMC] because they don't know. They must be reassured, told that there is hope [...].

Learning/Teaching KMC

In general, teaching and learning KMC was considered effective by healthcare providers and parents alike. Particularly peer-to-peer parent education was perceived as very effective. In contrast, access to structured KMC training for caregivers was felt insufficient, as also reported by Engler & al [19]. Broader training opportunities and institutional encouragement were desired.

All interviewees felt at ease with KMC and communicated willingly with others about it. Parents who had personally practiced KMC were particularly knowledgeable and keen advocates of the method in the community [18,20].

QUOTES:

Mother #9 : [...] I spoke to many women about the method during their pregnancy, for them to know that if their child were born premature, this [KMC] method exists. In my case, I was very surprised [about my child's prematurity]. Now, when my sisters or neighbours get pregnant, I talk to them about this possibility. [...].

Father #19 : [...] Now that my daughter is big and strong, it really takes me to heart to talk about this method to help other children. [...].

In-hospital KMC

When practicing KMC, especially at the beginning, fear for the child's death, weariness and stress were the predominant emotions reported. These feelings may be attenuated by anticipation, that is, better general knowledge on prematurity, LBW and KMC in the childbearing population. To reduce maternal exhaustion, more active encouragement or second KMC carriers should be considered [5].

QUOTES:

Mother #12 : [...] My hospital stay went well even though I was scared at first. I was stressed because I did not know how to proceed. I did not know that it was possible for a baby this small to survive. Many people told me that it was a waste of time, that my

baby would die anyway since it was this small. One day, a KMC mother showed me her son, all grown up and fat, even though he had been smaller than mine. This gave me the courage to continue. [...]

Mother #14 : [...] My husband tried to hold our baby [in KMC] once during our hospital stay but he did not wish to do it again afterwards. I am not sure why he did not wish to do it, maybe he found it tiring. [...]

For families, the parents', particularly the mother's, absence from home was considered a main difficulty. In addition, the close community criticized hospitalizations with costs deemed unreasonable. Arguments that traditional methods to care for small babies were as efficient but less expensive were common.

Several lines of evidence suggested poor reputation of healthcare structures in general; elements put forward were corruption and fraud, but also the high hospital mortality. In this respect, KMC appears an effective intervention to promote respectful and participatory care, and possibly rebuild community trust. Using advocacy of KMC-mothers and families, and including traditional chieftaincy, may therefore not only leverage promotion of KMC but more broadly paediatric healthcare in the African society [8].

QUOTES:

Mother #11 : [...] In my village, in order to avoid new-borns from getting cold, we use warm water bottles [...], they [the broader family] do not understand why I used KMC. [...]

Mother #15 : [...] First, I thought it was a scam from the hospital, so I did not really use the method. I only pretended to do so, and my daughter was not putting on any weight. Once, I tried holding my daughter [skin-to-skin] and I saw her gaining weight, I started believing in the method. [...]

Doctor #1 : [...] It is not the fact of carrying skin-to-skin that poses a problem, but prematurity itself. Mothers who have premature babies are discriminated. [...]

Home-KMC

A precautionous return home on KMC with proper follow-up is recommended by the WHO [5]. However, home follow-up in remote or inaccessible areas was complex. After in-hospital KMC, parents felt competent and confident with home-KMC and praised the teaching and encouragement by the dedicated KMC-nurse. The main complaint at home was tiredness.

Despite some considerable travel distances of up to several hours to reach the hospital, out-patient follow-up was preferred to home follow-up by parents. Their arguments were availability of anthropometric equipment and emergency services. We may infer that KMC made the healthcare structure more trustworthy. Caregivers preferred hospital follow-up too for reduced travel cost and logistics. However, home visits may have a promotional role in sensitizing remote communities with KMC, as reported in Ghana [21], thus supporting competent KMC-families within the community [8,9].

QUOTES:

Mother #14 : [...] ‘Auntie’ Caroline [KMC-nurse] is like a mother, she knows how to talk to us and how to give us confidence. [...].

Mother #9 : [...] I continued holding my baby skin-to-skin and going to my hospital appointments until I was told that I could stop. I continued [KMC] at home since I felt well prepared and encouraged. [...].

Barriers to KMC

The main general barrier reported was the lack of knowledge about KMC. Once the method understood, accepted and above all practiced, few barriers discourage parents, even when at first reluctant. Awareness campaigns, particularly during antenatal care, may therefore encourage broader use of KMC. Mothers were more easily convinced through concrete examples, other practicing mothers, and as reported elsewhere, rapid initiation of KMC at birth [17].

Other reported barriers, such as frequent changes in hospital management, corruption, and cultural prejudice in the community [8,9] were also reported by our interviews. The distance from home to hospital was not put forward as a significant logistic barrier, although frequently mentioned. We assume that the distance barrier was overcome by the acceptance of the method, as reported by others [8,9,22].

The main cultural barriers to KMC put forward by families were the bad reputation of hospital structures and community pressure to use cheaper “traditional” care of LBW babies. Although KMC itself was generally not considered against local habits, practicing KMC mothers strongly remembered negative social pressure from the extended family and relatives. Main concerns of the broader family were delayed return home, and a fatalist opinion on viability of the LBW baby. We hypothesize that parents who refused KMC may have experienced the impact of this social pressures and prejudices even stronger.

QUOTES:

Mother #18 : [...] My uncle told me my baby should die... Even my uncle criticized us ! He said we should already prepare the burial, given that my baby was too small. He came back to visit us after a month and apologized because he saw that in the end all was well. [...]

Mother #12 : [...] My mother, who is also the village mother, did not want me to participate [KMC program] because I could not get out of the hospital and that there were too many trips from and to the hospital. She said it was a waste of money, and that it would be better for me to come back to the village. [...]

Mother #14 : [...] My step-mother told me it was my fault [that I had a premature baby], since I had not been thorough with my follow-ups and my food. Each family member had a diverging opinion. Finally, the most important was that my husband wanted me to do it [KMC], despite what all others would say. [...]

Infrastructure, such as a dedicated KMC room as well as toilets/showers accessible to parents specifically set in place for the program were considered as provided but are seldom available in peripheral healthcare structures in the sub-Saharan context. Provision of equipment and consumables may be resumed to financial barriers. For caregivers, the carrying pouches were considered the most essential consumable. During the KMC project, two pouches were gifted to each participant for hygiene reasons. After external financing stopped, the healthcare structure was unable/unwilling to finance these pouches, temporarily leading the nurses to acquire them privately. Locally produced pouches costed 1’450 CFA (around 2.6 USD), close to one third of a nurse’s daily salary. This supports the view that healthcare staff was very supportive to KMC and that limitations were more at a hospital management level.

For parents and caregivers, financial capacity was spontaneously mentioned as the most important condition for KMC. However, upon direct interrogation, financial barriers were not considered the most important, although a selection bias is likely to downplay this barrier. Free governmental new-born care in Cameroon, including KMC [23], may mitigate these direct financial limitations to KMC.

QUOTES:

Mother #3 : [...] Money and what other people think is of no importance. At first, even for me, it was difficult to accept. It bothered me. But afterwards, since I love my baby, I would do anything for him. [...]

Paediatric head nurse : [...] It is mainly a problem of knowledge ; most people don't know what it [KMC] is. Until people have not tried, there remains doubt, they are unsure of the benefits. It is not a question of religion or culture. We often encounter people who initially refuse or are reluctant, but once they try, they continue. [...]

Like in most African district hospitals, patients had to acquire and pay for the necessary medical consumables. This included syringes, nasogastric tubes, saline solutions, oxygen, phototherapy, antibiotics, blood tests, and even hot water. Up to 30'000 CFA (54 USD) per day may thus add up to the regular hospital fees (particularly on oxygen therapy). For relatives and friends of our interviewees these additional expenses were regarded as means of profitmaking by hospitals. Consequently, KMC was associated to such practices.

Globally, work insecurity and unstable salaries were frequently recounted. With more than one third of Cameroon's population living under the poverty threshold, and with a GDP of 3'600 USD [24,25], the financial strain of treatment costs was evident and easily understandable. Several parents had to take loans in their community to pay hospital bills. To mitigate the financial burden, most parents would have gladly accepted simple work such as cleaning or gardening for the hospital. Caregivers were reluctant as they feared an additional workload for setting it up, and the potential risk for their own job.

Despite recommendation of reusable diapers by WHO [5] to reduce costs, disposables were largely preferred by our KMC mothers based on diverse arguments such as hygiene, religious beliefs and other personal reasons. Although a washing facility had been made available for the KMC program, easy access to a public water point is not always available at decentralized healthcare structures.

QUOTES:

Mother #20 : [...] For me, it [KMC] was an advantage since incubators are more expensive [...]. This method lowers the costs. Indeed, for the incubators, we must pay 5'000 CFA per day, whereas with KMC, we only had to pay the bed [...]. Care for premature babies adds up really fast, it can go up to 30'000 CFA per day [...].

KMC-Nurse : [...] Hospital costs can escalate quickly, especially if antibiotics, oxygen or phototherapy are needed [...]. I think financial limitations are 90% of the problem. [...]

Sustainability of the Project

Given the numerous advantages [6] and its broad recommendation by WHO, KMC should be the standard of care for LBW babies. The motivated KMC-nurse had maintained close contact with families and promoted KMC in addition to her primary role of in-hospital facilitator and data manager within the externally financed program. She played a key role for keeping the program alive. Transition from acute neonatal care to KMC needs close integration within the neonatal unit. Appropriate premises and adapted infrastructures for maternal comfort [5] appear essential since dyads are initially concealed within the unit, often sitting, or lying for hours [17,18]. However, mothers did not complain of boredom. Idle time was and may be further used for IEC sessions on neonatal and paediatric health care.

QUOTES:

Doctor #1 : [...] in order to maintain a KMC-unit, I think it's important to integrate the method in the basic new-born care [government package]. There needs to be a specific unit, and the responsibility of KMC babies has to be given to a specific and well-trained person. [...]

Nurse #1 : [...] For a KMC-unit to exist, there needs to be a reference nurse. KMC needs to be like a basic healthcare treatment, like an intra-venous perfusion. [...]

Conclusion

Our report focuses on facilitators and the main barriers to KMC put forth by parents and healthcare staff in a decentralized regional hospital of Cameroon serving a large and inaccessible catchment area.

Sequential interviews foremost revealed poor general knowledge of prematurity, LBW and KMC in the general population and a strong prejudice against healthcare structures.

General feedback from KMC-parents and caregivers on the method was always very positive. Although parents who personally had practiced KMC refuted direct costs as a significant barrier, their reports on societal prejudice, particularly arguments on the reputation of healthcare in general, clearly put forward these direct economic barriers. Hopefully, government support to new-born care, including KMC, will reduce some of these barriers. To improve KMC practice and possibly healthcare reputation, the best advocates are KMC-families as they hold a central role in society to integrate the method and reduce discrimination. We believe

that KMC has not only the potential to directly reduce neonatal mortality, but also to break the negative emotional spiral towards healthcare structures that suffer from bad reputation in general, in part unjustly due to late referrals of the sickest with high mortality rates.

Secondary costs, such as for travel and loss of income during work interruption, have been less reported during our interviews. This limitation may have been underestimated in our evaluation due to the selection bias of interviewees, all of whom had accepted and practiced KMC.

Supporting decentralized KMC infrastructures require education of dedicated staff but can count on high acceptance and motivation of caregivers. However, the viability and sustainability of a KMC program require an institutional and governmental commitment.

Based on our findings, we believe that using mothers as ambassadors promoting KMC, a conceptual support from the local healthcare management, and free government care for new-borns including direct in-hospital KMC costs, are the key components for sustainability in decentralised and rural low- and middle-income areas. However, indirect costs to families in remote regions should not be underestimated.

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