

Maternal factors associated with their satisfaction during kangaroo mother care implementation in a reference hospital: the case of the Teaching Hospital of Treichville, Abidjan, Côte d'Ivoire

Abstract

Introduction: The Kangaroo mother method (KMM) is an alternative method for the management of low birth weight, and its effectiveness has been proven. The aim of this study was to investigate the maternal factors associated with their satisfaction during KMM implementation.

Method: This was a cross-sectional and analytical method that took place in the paediatrics department at the Teaching Hospital of Treichville from 10 May 2022 to 09 May 2023. Mothers of low-birth-weight babies hospitalized and cared for via the kangaroo mother method were included. The data were analysed via Epi Info 7 software. The Fisher and chi-square tests were used to analyse the data, with a significance threshold of $p=0.05$ and a 95% confidence interval.

Results: A total of 209 mothers, with an average age of 26.9 years, were surveyed. A total of 38.7% (81 mothers) had not attended school. Twenty-three percent (48 mothers) were single mothers. The predominant gestational age was that of very premature babies (28 WG to 32 WG), with 59%, and the average low birth weight was 1415 ± 290.3 g.

The factors associated with maternal satisfaction were as follows: maternal age > 18 years was associated with satisfaction ($p=0.043$; OR= 0.41 (0.17-1)), premature delivery was associated with maternal satisfaction ($p=0.016$; OR= 0.39 (0.18-0.86)), residence close to Treichville's teaching hospital was associated with maternal satisfaction, with $p=0.026$ and OR= 2.52 (1.1-5.8), marital status was statistically associated with maternal satisfaction, with $p=0.03$ and OR= 2.26 (1.05-4.85), prior knowledge of KMM, with $p=0.016$ and OR= 0.36, 95% CI (0.18-0.86), method of kangaroo mother care (KMC) practice, with $p=0.016$; OR= 0.39 (0.18-0.86)

Conclusion: The kangaroo mother method is a credible alternative to incubation. Maternal factors associated with mothers' satisfaction when implementing KMC include age, premature birth, place of residence, as well as their knowledge and way of practicing KMM. It would be imperative for a more harmonious practice of KMM to have a more conciliatory approach towards young mothers with low educational levels.

Keywords: maternal factors, kangaroo method care, satisfaction, Côte d'Ivoire

Volume 15 Issue 1 - 2025

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Received: January 18, 2025 | **Published:** February 20, 2025

Background

KMM comprises a package of care, including continuous and prolonged skin-to-skin contact between the infant and the mother, exclusive breastfeeding and early discharge from the hospital. This method has proven effective in several countries,¹ and is now recommended by the WHO as an alternative to conventional neonatal care for low-birth-weight babies.²

Neonatal mortality is still high, and is still dominated by deaths due to complications associated with low-birth-weight. An estimated 13.4 million infants were born prematurely (before 37 completed weeks of gestation) worldwide in 2020.³ The complications of prematurity are the leading cause of death in children under five, accounting for almost 900,000 deaths in 2019.⁴ Sub-Saharan Africa had the highest neonatal mortality rate in 2019, with 27 deaths per 1,000 live births. The majority of neonatal deaths (75%) occur in the first week of life, with approximately 1 million newborns dying within the first 24 hours.⁵ Prematurity and its complications were one of the main causes

in sub-Saharan Africa including Côte d'Ivoire.⁶ Neonatal mortality in Côte d'Ivoire in 2021 remains high at 30 per thousand births,⁷ despite the implementation of high-impact interventions to reduce neonatal morbidity and mortality.⁸ One of these interventions, which mainly targets the complications associated with prematurity, is the Kangaroo Mother Care Method (KMCM).⁹

Following the adoption of UNICEF's Action Plan for Every Child, Côte d'Ivoire operationalized KMM to reduce neonatal mortality, which is dominated by prematurity.⁸ This was achieved by opening the first Mother and Baby Care Centre (a sub-unit of the neonatology unit) within the paediatrics department of Treichville's Teaching Hospital.

Kangaroo care is offered to families, who are free to accept or refuse it. How acceptable is this method of care to mothers of low birth weight (LBW) babies at Treichville's Teaching Hospital? Additionally, after five years of operation and as a prelude to the forthcoming opening of a larger unit and in view of the refusal of

some mothers to practise the kangaroo method continuously, we initiated the present study to analyse the factors associated with the satisfaction of mothers of LBW practising the kangaroo mother care method at Treichville's Teaching Hospital.

Method

We conducted our study in the paediatric department at the Teaching Hospital of Treichville, in the neonatology unit, and in the permanent and intermittent mother kangaroo care sub-units.

The neonatology unit has room for intermittent kangaroo mother care. This room is approximately 70 square metres long and has 8 deckchairs (relaxation chairs), a shower room, a television screen, a hospital bed and a desk and chair for the health worker. In the same neonatology unit, we have a permanent mother kangaroo unit. This 250 square meter unit has 10 hospital beds suitable for KMC, washrooms for mothers (3) and staff (1), a kitchen, a dining room with 6 seats, a lounge for receiving visitors, a courtyard with flowers, a shed with tables and chairs for talking and receiving visitors, a television screen with encrypted channels, 2 offices for health workers and a meeting room with approximately 20 seats.

This is a cross-sectional and analytical study of mothers of low-birth-weight and premature newborns, with a focus on whether KMM is practised continuously. The mothers were included from 10 May 2022 to 09 May 2023, i.e., for 12 months.

To do this, our study population was the mothers of premature and low-birth-weight babies admitted to the neonatology unit (incubator or kangaroo mother care unit) at Treichville's Teaching Hospital, LBW mothers who practised KMC continuously or intermittently for at least 5 consecutive days, mothers who provided oral consent prior to inclusion.

Mother whose LBW died before the interview were excluded.

KMC practices for at least 6 hours and mothers who practice KMC continuously for at least 20 hours were assessment criteria.

The minimum sample size was calculated via the Schwartz formula:

$$n = z^2 p (1-p) / d^2$$

n = minimum sample size required

z = number of standard errors relative to the mean (for a 95% confidence level, z = 1.96)

p = prevalence of satisfaction; we assume that the prevalence of satisfaction among mothers admitted to SMK and those discharged from the unit is 60% on the basis of studies carried out in other countries.^{9,10}

d = precision (10%)

The minimum sample size required for the study was 92 mothers.

The dependent variable was mothers' satisfaction, with two modalities: satisfied and not satisfied.

The independent variables selected were the sociodemographic characteristics of mothers (age, level of education, occupation, marital status, occupation of spouse) and their obstetric characteristics (mode of delivery, newborn weight at birth, parity, gestation, history of stillbirth, history of premature birth), knowledge of KMC, and amenities (knowledge of KMM, training, process and kangaroo

position, time or resources, child and mother privacy and safety, premises).

The interview data was collected using a questionnaire developed by the research team and finalized on the basis of a test carried out in the care sub-unit of the neonatal unit. The questionnaire consisted of closed and open questions. The closed questions dealt with knowledge of the KMC unit and the following areas: reception, relationship with healthcare staff, care given to the newborn, comfort, breastfeeding counselling, length of stay, and overall satisfaction. The open-ended questions dealt with the reasons for dissatisfaction in each of these areas. The questionnaire was administered by two of the department's doctors working in the neonatal unit and in the kangaroo mother care unit.

To better understand some aspects of this research the terms of reference were defined, they were: Continuous or permanent KMC: practice of KMC with the mother or substitute who is hospitalized with the newborn and practises the method continuously, i.e., at least 20 hours of carrying the newborn in the "kangaroo position" and who herself feeds the newborn, does his nursing and other care under the supervision of the care staff. In addition, discontinuous or intermittent KMC was putting the baby in the kangaroo position, feeding and nursing in a day hospital (from 9 am in the morning to 6 pm in the afternoon) outside the curative care provided by the healthcare staff, for at least 5 consecutive days.

The data collected were entered into Microsoft Excel, processed and analysed via Epi Info 7 software.

For measures of association, the odds ratio (OR) was calculated with its 95% confidence interval. Proportions were compared via the Fisher, Yates and Chi-square tests at a threshold of $\alpha = 5\%$. The difference was considered significant if the p-value was less than 0.05.

An OR > 1 means that MMK has an effect on the occurrence of the event studied; if the OR < 1, MMK prevents the occurrence of the event studied; if the OR = 1, KMM has no influence on the event studied, taking into account the confidence intervals.

Ethical issues

The study was carried out in accordance with good clinical practice and the authorizations given by the Medical and Scientific Department of Treichville's Teaching Hospital.

Medical confidentiality was respected.

The confidentiality of the data collected was scrupulously respected by assigning a number to each file.

Oral consent was obtained from all study participants. Participation was voluntary, and participants were informed of their right to withdraw from the study at any time. The data were collected, managed and analysed in such a way as to guarantee the confidentiality of the study participants.

Results

Basic characteristics

During the study period, out of 436 mothers of LBWs admitted to the service, 209 mothers were surveyed, with an inclusion rate of 47.9%. Maternal characteristics were noted in the table below (Table 1). In addition, the birth weight of their LBWs was 1415 ± 290.31 grams, with extremes ranging from 860 to 2100 grams.

Table 1 Basic characteristics n=209

Age of the mother	Number (n)	
	Average age= 26,9 ± 6,57	Percentage
≤ 18 years	22	10,5%
18- 34 years	170	81,4%
≥35 and more	17	8,1%
Educational level		
Not schooling	81	38,7%
Primary	25	12%
Secondary	69	33%
Higher	34	16,3%
Marital status		
Married	19	9,1%
Cohabiting	142	67,9%
Single or widow	48	23%
Place of residence		
Abidjan	183	87,6%
Outside Abidjan	26	12,4%
Occupation of the mother		
none	123	59,3%
Liberal activity	65	31,1%
Formal activity	21	10%
LBW history		
Yes	30	14,3%
No	179	85,7%
Pathologies during pregnancy		
HBP - Diabetes	39	17,5%
Hemoglobinopathy	6	2,9%
HIV/AIDS	6	2,9%
Parity		
1	99	47,4%
2-3	96	45,9%
≥4	14	6,7%
Previous knowledge of KMM		
Yes	30	13,9%
No	179	86,1%
Type of KMC practice		
Intermittent	110	52,6%
Continuous	99	47,4%
Gestational age of LBW		
< 28 WA	4	1,9%
28-32 WA	122	58,4%
33-37WA	81	3,9%

Knowledge and practice of the kangaroo mother method

In the population surveyed, 86% of mothers were aware of KMCs, 50% through talks and 42.8% through the media. Also, during their stay in hospital, 77% of mothers (i.e. 161 mothers) stated that they had been made aware of KMC by the nursing staff, compared with 23% (i.e. 48 mothers) who stated that they had not been made aware of SMK.

Mothers' satisfaction and associated factors

144 mothers (68.9%) were satisfied during their stay in the KMC unit.

The factors associated with mothers' satisfaction during their stay were associated with certain basic characteristics of the mothers, in particular their age (the younger the mothers, the less satisfied they were), their marital status and their place of residence. The mothers' obstetrical history was also associated with their satisfaction, namely their history of prematurity and parity. Knowledge of kangaroo mother care and the way in which this care was practised were also associated with maternal satisfaction. (Table 2)

Table 2 Factors associated with mothers' satisfaction during their stay

	Satisfaction		P-value	OR(CI _{95%})
	Satisfied (n=144)%	Not satisfied (n=65)%		
Age of the mother				
Less than 18 years	11 (50,0%)	11 (50,0%)	0,043*	0,41(0,17-1,0)
18 and more	133(70,8%)	54 (29,2%)		
Educational level				
Not schooling or Primary	71 (67,4%)	35 (32,6%)	0,543	0,83(0,46-1,49)
Secondary or Higher	73 (70,8%)	30 (29,2%)		
Marital status				
Married or cohabiting	42 (82,6%)	10 (17,4%)	0,03*	2,26(1,05-4,85)
Single or widow	102 (64,9%)	55 (35,1%)		
Occupation				
No occupation	96(78%)	27(22%)	0,001*	2,81(1,54-5,13)
Gainful activity	48(55,8%)	38(44,2%)		
Place of residence				
Abidjan	131 (71,8%)	52 (28,2%)	0,026*	2,52(1,1-5,8)
Outside Abidjan	13 (50,0%)	13 (50,0%)		
Obstetrical history of mothers				
Prematurity or LBW				
Yes	15 (50,0%)	15 (50,0%)	0,016*	0,39(0,18-0,86)
No	129 (72,3%)	50 (27,7%)		
Parity				
1	64 (68,2%)	30 (31,2%)	0,88	0,96(0,53-1,73)
2 and more	78 (69,8%)	35 (30,2%)		
Factors linked to KMC				
Previous knowledge of KMM				
Yes	15 (50,0%)	15 (50,0%)	0,016*	0,39(0,18-0,86)
No	129 (72,3%)	50 (27,7%)		
Type of KMC practice				
Intermittent	67 (33,3%)	43 (66,7%)	0,008*	(0,24-0,83)
Continuous	77 (68,7%)	22 (31,3%)		

The reasons given by the mothers for their dissatisfaction were researched and listed. It emerged that the main reason for mothers' dissatisfaction was the lack of facilities in the care unit. (Figure 1).

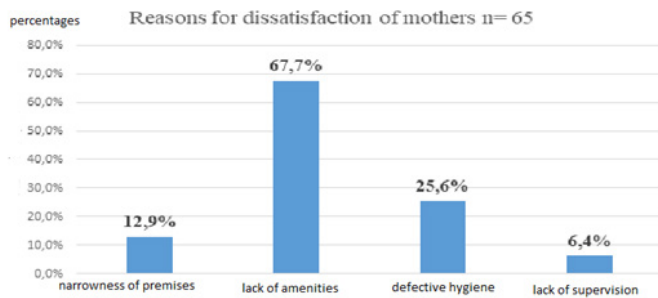


Figure 1 Reasons for dissatisfaction among mothers not using KMM.

Discussion

Given the importance of KMM for the survival of LBW and as a prelude to its implementation in our country, it was essential to carry out this study, the aim of which was to study the maternal factors associated with the satisfaction of LBW during their stay in KMC. The aim was to improve and facilitate the acceptability of KMCs. It emerged from this study that the main maternal factors associated with their satisfaction during KMC were age, marital status, place of residence in relation to the KMC site, prior knowledge and mode of practice of KMC. Although this study has its limitations, particularly in relation to the subjectivity of the mothers' assessment of satisfaction and the fact that it was conducted in an urban area, the results obtained give rise to points for discussion.

Mothers employed in the public sector represented 10% of those surveyed. A similar study carried out in the same KMC unit at Treichville teaching hospital in 2021¹¹ found a slightly lower proportion of 6.25%. This relatively higher proportion of public sector workers in our study could be explained by the fact that since the opening of this unit, awareness campaigns and increased communication by the national mother and child health programme of Côte d'Ivoire have been carried out to show the impact of this method of care on the outcome of low birth weight babies. In fact, our study reveals that more than half (85.6%) had not heard of KMM; and in the population of mothers with knowledge of KMM, 50% had heard of it through exchanges within the population and not through official channels. This could lead us to say that the low level of education could reduce the opportunity to have the right information on KMM, as the information received through exchanges within the population could be incomplete or even erroneous.

Mothers' satisfaction and associated factors

Just over half (68.9%) of the mothers were satisfied. This rate is lower than that found by Kadidiatou et al, where 100% of mothers were satisfied.¹¹ This difference could be explained by the fact that our study involved a slightly different population of mothers compared to that of Kourouma et al, those who still had their newborn in an incubator and those who were in a kangaroo unit with their newborn. Whereas Kourouma's study focused only on mothers admitted to the kangaroo unit. Furthermore, the experience of mothers with their babies in incubators is not the same as that of mothers with their babies close by, who can touch them at any time, and are even the main players in the management of low birth weight.

Our results showed that mothers' satisfaction was correlated with certain factors, in particular age: the older the mother, the more satisfied she was. In the study by Kadidiatou et al carried out in the same unit, this same factor (mothers' age) was associated with satisfaction.¹¹ In

their study, mothers aged between 20 and 24 were more likely to be satisfied with their study. Mothers who were self-employed were also more likely to be satisfied, whereas in our study mothers who were not self-employed were more satisfied ($p=0.01$ (OR=2.81(1.54-5.13))). This slight difference could be explained by the larger size of our population, the slight difference in the study population, ours including mothers who practised KMM intermittently, and also probably by lower requirements for mothers not in gainful employment.

The lack of supervision by staff could be a hindrance to the success of KMM practice and a source of dissatisfaction, as our results show, all the more so in the case of single mothers ($p=0.03$; OR=2.26(1.05-4.85)) and relatively young mothers ($p=0.043$ OR=0.41(0.17-1.0)), mothers with less experience, whereas KMM places the mother at the centre of care, as our study shows. In fact, one of the particularities of KMM is to give the mother her place as the main provider of care for her newborn, and this necessarily requires support to make her capable and confident, a guarantee of success for continuity of care at home, as Raajashi R et al found in their study.¹²

This support therefore requires the presence of sufficient numbers of trained staff, demonstrating the importance of lobbying the human resources of the country's Ministry of Health and Public Hygiene to allocate sufficient staff to be able to run the new, much larger unit and avoid this kind of setback for beneficiaries.

In addition, during our survey, mothers resident and fed in the KMM unit expressed feelings of satisfaction and gratitude for this opportunity offered to them, which could explain these results ($p=0.026$; OR= 2.52(1.1-5.8)). On the other hand, those who commuted were not very satisfied because they found themselves in uncomfortable situations (lack of amenities, cost of transport, food, etc.). This was also found by Heinemann et al. in their study of the care of premature babies in intensive care, who felt that parents were in difficulty when they had to divide their time between hospital and home, often with other children at home. They express physical and emotional exhaustion and it is therefore also important to pay attention to the parents' sleep and meals so that the KMC is beneficial for the baby and themselves.¹³ Furthermore, the fact of having experience in the management of premature babies (antecedent prematurity) ($p=0.016$; OR= 0.39(0.18-0.86) or of having heard about the Kangaroo Mother Care method ($p=0.016$; OR= 0.39(0.18-0.86) may be associated with maternal satisfaction, as our results show. These results were also noted by Kadidiatou et al in their study.¹¹

However, the mothers' level of education was not significantly associated with maternal satisfaction ($p=0.543$ OR=0.83(0.46-1.49)). This finding is not very surprising and could be explained by the fact that even mothers with a low level of education have a lot of chance and opportunity to hear about KMM, particularly through awareness programmes, the media or other means of communication related to new information and communication technologies (NICTs) such as so-called social networks. These new information techniques can play an important role in the practice of KMC, as shown by the conclusions of the study by Victor L et al in the United States, which describes how a mother used research articles demonstrating the advantages of KMM to convince the staff of the institution to let her practise KMM.¹⁴ In this sense, a low level of education could be an obstacle to research, to knowledge and even to a good understanding of KMM. Knowing about a practice, hearing about its advantages and possible difficulties could constitute a first contact with the practice and allow a better understanding of it when faced with a situation that requires its implementation and to be more satisfied by making one's own experience.

Reasons for mothers' dissatisfaction

The reasons for dissatisfaction in our study were dominated by the lack of amenities, the poor hygiene of the premises, the narrowness of the premises and the inadequate supervision of mothers practising KMM by health staff. In addition, in the study by Kadidiatou et al, dissatisfied mothers cited other reasons, namely: lack of information about how the unit worked, difficulties in implementing exclusive breastfeeding, restrictions on visits due to COVID-19, uncomfortable beds and mattresses, lack of privacy, lack of help with meals for hospitalised mothers and length of stay being too long.¹¹

Inadequate facilities were the main reason (67.7%) for mothers' dissatisfaction. This result corroborates that of Kadidiatou et al. This could be explained by the fact that the building's facilities were not initially designed to be used by a large number of users and even for Mother and Baby Care. It was therefore imperative to find a new building with facilities adapted to the size of the users, hence the interest in carrying out this study in order to determine the real needs of the mothers with the aim of improving their experience during their stay in the KMC practice, as a prelude to the opening of the new service.

Another reason for dissatisfaction was the inadequate supervision of mothers by staff (6.4%) during their stay. Concerning the lack of information on how the unit operated, this result is in line with that of Olubukola Olawuyi et al in Nigeria, where less than half the mothers had received information on how the unit operated.¹⁵

Welcoming the patient is the first stage of care, and its quality can influence future relations with the staff. It is important for healthcare staff to communicate more about how the unit works during the welcome to improve mothers' knowledge of the unit and their satisfaction with it. These variations in satisfaction could be explained by several factors, such as the mothers' origin, their socio-economic level, their level of education and many others. The majority of the mothers surveyed (50.7%) had a low level of education (less than or equal to primary level). As in a study carried out in Cameroon, where they found that 65% of respondents had less than primary education.¹³ The low level of education could constitute an obstacle to good understanding and reception of information on KMMs, even if some authors such as Mutinje et al did not find a link between satisfaction and level of education.¹⁶

Weak points

This study must be considered within the limits of certain weaknesses. The fact that it was a monocentric study does not necessarily reflect the experience of the entire Ivorian population. In addition, the study took place in an urban area compared with semi-urban or rural areas. In the latter, the perception of hotel amenities is not necessarily the same as in urban areas. Contextual factors such as socio-demographic characteristics and data collection technique should be taken into account. It would be advisable to carry out a multicentre study to obtain more relevant results.

Strong points

Despite these limitations, the study did identify some strong points, in particular the urgent need to upgrade the structure for caring for newborn babies with a minimum of facilities. It also identified certain maternal factors that could be linked to their satisfaction. These factors should be systematically researched in order to optimise the participation of mothers in KMC, with the aim of providing quality care based on maternal satisfaction.

Conclusion

Our study revealed that the satisfaction of mothers could promote or constitute obstacles to the practice of KMM at Treichville's

Teaching Hospital. Elements of dissatisfaction among users include a lack of convenience, hygiene and supervision by care staff. Therefore, it seems essential for health authorities and nursing staff to make every effort to take into account these concerns and improve the quality of stay of mothers during their stay in the KMC unit, guaranteeing the success of the practice of KMM even after their unit output.

Acknowledgements

None.

Funding

None.

Conflict of interest

The authors declare that they have no conflicts of interest in relation to the content of this article.

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