

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/338077358>

# Barriers and facilitators to the implementation of Kangaroo Mother Care in the community – A qualitative study

Article in *Journal of Neonatal Nursing* · December 2019

DOI: 10.1016/j.jnn.2019.11.008

CITATIONS

3

READS

239

5 authors, including:



**Hadi Pratomo**  
University of Indonesia

47 PUBLICATIONS 107 CITATIONS

[SEE PROFILE](#)



**Evi Martha**  
University of Indonesia

28 PUBLICATIONS 42 CITATIONS

[SEE PROFILE](#)



**Ade Iva Wicaksono**  
Pancasila University

3 PUBLICATIONS 4 CITATIONS

[SEE PROFILE](#)



**Asri Adisasmita**  
University of Indonesia

24 PUBLICATIONS 16 CITATIONS

[SEE PROFILE](#)

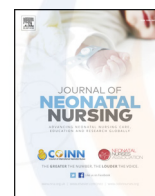
Some of the authors of this publication are also working on these related projects:



Hibah Pitta (Pitta Grant Research UI) [View project](#)



Community service (Pengmas) from Universitas Indonesia [View project](#)



## Original Article

# Barriers and facilitators to the implementation of Kangaroo Mother Care in the community - A qualitative study

Intan Silviana Mustikawati<sup>a</sup>, Hadi Pratomo<sup>b,\*</sup>, Evi Martha<sup>b</sup>, Ade Iva Murty<sup>c</sup>, Asri C. Adisasmita<sup>d</sup>

<sup>a</sup> Doctorate Public Health Student, Faculty of Public Health, Universitas Indonesia, Indonesia

<sup>b</sup> Department of Health Education and Behavioral Sciences, Faculty of Public Health, Universitas Indonesia, Indonesia

<sup>c</sup> Faculty of Psychology, Universitas Pancasila, Indonesia

<sup>d</sup> Department of Epidemiology, Faculty of Public Health, Universitas Indonesia, Indonesia

## ARTICLE INFO

## Keywords:

Kangaroo mother care  
Skin-to-skin contact  
Community  
Low birth weight infant  
Formative research

## ABSTRACT

Kangaroo Mother Care (KMC) for low birth weight infants (LBWIs) has been shown to prevent disease and improve infant survival. This study aimed to identify barriers and facilitators to KMC implementation and identify solutions for overcoming the barriers. This study was a rapid qualitative study included in-depth interviews and observations with ten LBWIs' mothers post-discharge from Koja District Hospital, North Jakarta and five health workers in North Jakarta. The informants were selected by consecutive sampling. Observations explored KMC practices among LBWIs' mothers, and in-depth interviews identified barriers and facilitators to KMC practice and explored feasible solutions for handling the barriers. The data was analysed by thematic analysis approach and validated by source triangulation. Four themes of barriers and facilitators of KMC implementation in the community were buy-in and bonding, family support, household works, and medical concerns. Community health workers empowerment and antenatal care awareness emerged as feasible solutions for overcoming barriers to KMC practice in the community.

## 1. Introduction

Low Birth Weight Infants (LBWIs) are babies born weighing less than 2500 gm, regardless of gestational age (Indonesian Ministry of Health, 2009). The most common underlying reasons for LBWIs are prematurity, intrauterine growth restriction, or a combination of both (Lawn et al., 2010).

Kangaroo Mother Care (KMC) is early, continuous, and prolonged skin-to-skin contact between the mother and preterm babies; exclusive breastfeeding or breast milk feeding; early discharge after hospital-initiated KMC with continuation at home; and adequate support and follow-up for mothers at home (WHO, 2003). Several studies showed that KMC could help reduce mortality and morbidity in preterm babies or LBWIs (Sloan et al., 2008; Boundy et al., 2018). Newborns held skin-to-skin contact for 7 h per day in the first 2 days of life had lower Neonatal Mortality Rate (NMR) than that of the infants without being held skin-to-skin contact (Sloan et al., 2008). A systematic review and meta-analysis, estimating the association between KMC and neonatal outcomes, found that there was a 36% lower mortality rate in LBWIs with KMC compared to conventional care (Boundy et al., 2016). KMC

decreased the risk of neonatal sepsis, hypothermia, hypoglycemia, and hospital readmission and increased exclusive breastfeeding. Newborns receiving KMC had lower mean respiratory rates and pain measures and higher oxygen saturation, temperature, and head circumference growth (Boundy et al., 2016). Another study among preterm babies found that weight, length and head circumference gain were significantly higher in the KMC group than the control group (Swarnkar and Vagha, 2016).

KMC in the community is KMC performed during post-treatment (early hospital discharge) or carried out with LBWIs born at home (Bailey, 2012). Unlike hospital-based KMC, KMC in the community is aimed at all infants, regardless of birth weight, is performed immediately after birth, and does not require clinical assessment or birth weight to identify eligible infants (Ahmed et al., 2011). The aim of KMC in the community is to prevent hypothermia, respiratory problems, and diarrhea, while improving newborn nutrition (Ahmed et al., 2011).

The different conditions between hospitals and communities will affect acceptance of KMC in the community. In the hospitals, the mothers received both education and supervision from the health personnel. While at home there were various factors that prevent the mothers to practice KMC. The barrier factors among others were lack of

\* Corresponding author.

E-mail addresses: [intansilviana12@gmail.com](mailto:intansilviana12@gmail.com) (I.S. Mustikawati), [Hadi.Pratomo@ui.ac.id](mailto:Hadi.Pratomo@ui.ac.id) (H. Pratomo), [evimarta@yahoo.com](mailto:evimarta@yahoo.com) (E. Martha), [adeiva.murty@univpancasila.ac.id](mailto:adeiva.murty@univpancasila.ac.id) (A.I. Murty), [aadsm237@gmail.com](mailto:aadsm237@gmail.com) (A.C. Adisasmita).

<https://doi.org/10.1016/j.jnn.2019.11.008>

Received 31 May 2019; Received in revised form 25 October 2019; Accepted 28 November 2019

Available online 20 December 2019

1355-1841/ © 2019 Neonatal Nurses Association. Published by Elsevier Ltd. All rights reserved.

understanding as well as confidence of mothers that KMC was a solution to the problem of LBWI, and were busy with household work and child care. Therefore, they need supports to practice KMC in the community. Various studies discussed supportive factors of KMC practice in the community, namely family and health workers (Dawar et al., 2019; Mazumder et al., 2018; Opara and Okorie, 2017; Nguah et al., 2011; Rasaily et al., 2017). Family members provided support by doing household work and assisting the mothers in practicing KMC at home. This were the most important supports of KMC practice (Dawar et al., 2019; Mazumder et al., 2018; Opara and Okorie, 2017). Another support was health workers offering KMC education during the antenatal period along with essential newborn care messages. These messages were reinforced during the postnatal period to increase KMC acceptability (Rasaily et al., 2017).

North Jakarta has the second highest levels of neonatal mortality and LBWI prevalence in Jakarta (Jakarta Capital Special Region Health Office, 2017). Studies on KMC perceptions and practices in hospitals have been conducted, one of which was carried out in Koja Hospital, North Jakarta (Bergh et al., 2018). However, the implementation and sustainability of KMC practices in the community, after mothers are discharged from the hospital, are not yet known. Identifying barriers and facilitators for KMC practices in the community is the initial step for designing interventions appropriate for KMC success.

Research question for this study was what were barriers and facilitators to the implementation of Kangaroo Mother Care in the Community?

## 2. Methods

### 2.1. Study design

This study was a rapid qualitative study (Creswell, 2017) using observation and in-depth interviews. This study was a preliminary study for community health workers mentoring for KMC practice among LBWIs' mothers in the community. By identified the barriers and facilitators of KMC practice in the community, an appropriate intervention can be made by involving other elements in community such as community health workers to provide assistance in KMC practice among LBWIs' mothers in the community.

Observation and indepth-interviews were conducted with ten mothers with LBWIs (post-discharge from Koja District Hospital, North Jakarta) and five health workers of primary health care. The participants were selected by consecutive sampling.

### 2.2. Data collection

Data was collected from October to November 2018 to gather information about the barriers and facilitators of KMC practices in the community. Data collection was carried out by observation and in-depth interview. Observations explored KMC practices among mothers with LBWIs, and in-depth interviews identified barriers and facilitators to KMC practice and explored feasible solutions for handling the barriers. The study was using observations to complement interviews method, since position of KMC practice can adequately assessed by observation. LBWIs' mothers who had been discharged from Koja District Hospital, North Jakarta for maximum 1 week, were visited at home to observed and interviewed regarding KMC practice. The researchers were doing home visit together with health workers to assess the LBWIs'mothers.

KMC practice of LBWIs' mothers were observed by two researchers to explore the position of KMC practice. The LBWIs'mothers were asked to demonstrate how to carrying their infants on the KMC position, which took time about 15 min per person. The researcher wanted to know whether they practiced KMC with the right position. The data were recorded using observation form.

Another data collection was done by in-depth interviews.

LBWIs'mothers were interviewed by one of researcher's team. Semi-structured in-depth interviews were asked for 45 min per person. The interviews include socio-demographic characteristics, practice of KMC, and barrier and facilitator factors of KMC practice. Health workers were interviewed in the health office, separate area with mothers to identify the feasible solutions for handling the barriers of KMC implementation in the community. The semi-structured in-depth interviews were asked for 45 min per person. All interviews were recorded and transcribed verbatim.

Saturation occurs if there is no data variation, no new answer or information to the given question or answer given. To avoid bias between researchers was to cross check between researchers and discuss the results obtained from the informant. If needed, the researcher will check the field again.

### 2.3. Data analysis

The interview and observational data from audio-recordings were transcribed verbatim in Microsoft Word. The data were transcribed by the lead researcher assisted by research assistants. The research assistants were trained first before helping research activities. The transcripts were organized and analysed to identify common themes regarding mothers' experiences of practicing KMC. Time to do the transcript was two weeks.

Then coding was made based on the theme, then made a matrix of interviews results. Coding schemes are based on the development of research objectives. These codes were then categorized into broad categories and sub-categories and reviewed within the study team to improve reliability of application to full transcripts. Coding was derived from the variable description. For example, a lot of housework, nobody helps the mother to tie the gown to practice KMC.

Following a thematic analysis approach, the first researcher read and reviewed the transcripts continuously, identify and arrange the themes in the dataset, examining commonalities, differences, and relationships. To strengthen the validity of findings, we triangulated the interviewer and observations of KMC practice among LBW's infants' mothers with health worker (KPLDH) who were doing home visit to LBW's infants' mothers.

## 3. Result

The study was to identify barriers and facilitators for KMC implementation in the community and to determine feasible solutions to overcome the barriers. Four themes of barriers and facilitators will be presented as follows: buy-in and bonding, family support, household works, and medical concerns; and two themes of feasible solutions of KMC implementation in the community: community health workers empowerment and antenatal care awareness.

The average age of LBWIs' mothers of this study was 31 years old. The majority had completed junior or senior high school, and two were previously parous All mothers were housewives. Meanwhile, the average age of health workers was 35 years old, and most had bachelor's degrees.

### 3.1. barriers and facilitators of KMC in the community

We identified four themes that describe the barriers and facilitators of KMC in the community: buy-in and bonding (acceptance of KMC and its benefits), family support (encouragement and aid in performing KMC), household works (domestic chores, caring another children), medical concerns (health condition of LBWIs' mothers and infants and perceived that KMC will hurt infants and make infants discomfort).

#### 3.1.1. Buy-in and bonding

Buy-in and bonding referred to the practice of KMC and belief in the benefits of KMC to infants. All 10 LBWIs' mothers were practiced KMC



after discharge from hospital, but none of them did it continuously. Average, LBWIs' mothers were practiced KMC for 3 h per day. Six LBWIs' mothers were practiced KMC twice daily; in the afternoon and evening and the rest were only practiced KMC once a day; in the afternoon or evening. Based on observations, five LBWIs' mothers practiced KMC in the right position, where there was direct skin-to-skin contact between mothers and infants.

In general, KMC (skin-to-skin-contact) was carried out by LBWIs' mothers, but other family members, such as husbands, sisters, and grandmothers also took part in conducting KMC. Usually the husbands would replace LBWIs' mothers doing skin-to-skin-contact at night when they came home from work. One noting: "My husbands will replace me doing skin-to-skin-contact at night when he's going home" (LBWIs' mother, 36 years old).

KMC practice among LBWIs' mothers was affected by knowledge and attitude regarding KMC. All 10 LBWIs' mothers had been educated about KMC previously from Koja District Hospital, North Jakarta where the infants were born and they had practiced it at the hospital. They were agreed to continue practice KMC at home and their statements was strengthened also by health workers. One noting: "All of LBWIs' mothers had already received education about KMC in the hospital. They agreed to continue it at home" (Female health worker, 38 years old). Seven LBWIs' mothers had positive belief in the benefits of KMC to infants. According to them, the reason for carrying out KMC at home was to warm up the infants, to increase the infants' weight, to nourish and strengthen the infants. One commented: "If I'm doing KMC, the infants will become warm, healthy, and strong" (LBWIs' mother, 40 years old).

Exclusive breastfeeding was one of the components of KMC, but none of LBWIs' mothers were conducting exclusive breastfeeding. The infants have been given formula milk for premature babies since hospitalized. One noting: "When in the hospital, I was told to give formula milk [to the infant], the color [the can's color] was purple. But this brand did not exist on the market. Maybe it ehhhh ... made specially for the hospital" (LBWIs' mother, 42 years old). When returning home, the LBWIs' mothers gave milk in a variety of ways, that were only give breast milk, breast milk and formula milk, formula milk alone without breast milk, and combinations of breast milk, formula milk, and other liquids. The main purpose of adding another liquid other than breast milk was to increase the infants' weight. Another reason was lack of breast milk in LBWIs' mothers and the experience of formula milk feeding in previous children. They argue it was no problem when giving formula milk or another liquid to the infants. One commented: "Yeahh, if the mothers' breast milk was lacking, can be added with formula milk for the premature baby as for his older brother" (LBWIs' mother, 36 years old).

### 3.1.2. Family support

Family support referred to the assistance from other people (family members) to perform KMC. In this study, the supports were in the form of providing encouragement and motivation in performing skin-to-skin-contact, replacing LBWIs' mothers to perform skin-to-skin-contact when she had personal needs, and assisting with other household chores so that LBWIs' mothers could perform skin-to-skin contact. Six LBWIs' mothers got remind and motivation from family members to perform skin-to-skin-contact. One noting: "I was told by my mother to perform skin-to-skin-contact routinely so that the baby's weight gained" (LBWIs' mother, 25 years old).

The skin-to-skin contact was impaired if LBWIs' mothers lived in a nuclear family (not having extended family). If the husband going to work, no one replaced LBWIs' mothers to perform skin-to-skin-contact when the mothers had personal needs. The husband can only perform skin-to-skin-contact at night when he got home. Usually the LBWIs' mothers had trouble tying cloth to perform skin-to-skin contact. They can get assistance to tie the cloth before their husband going work or wait until their husband comes home. This trouble will affect the

duration of skin-to-skin contact which is likely to reduce its benefits. One noting: "If I'm alone, it's hard to practice skin-to-skin contact, because nobody helps me to tie cloth [for skin-to-skin contact]. I must wait for my husband to go home" (LBWIs' mother, 36 years old).

In contrast, skin-to-skin contact practice can be frequently performed if LBWIs' mothers lived in an extended family (live with parents and sisters in one house). The family members can replace LBWIs' mothers in performing skin-to-skin contact when the mothers had to rest or had personal needs. Three LBWIs' mothers who lived in extended family performed skin-to-skin contact in the morning, afternoon, and evening. One noting: "My sister replaced me to perform skin-to-skin contact when I need rest. She was very concerned about the infants." (LBWIs' mother, 20 years old). Besides replaced LBWIs' mothers in performing skin-to-skin contact, family members also assisting with household chores such as cooking and cleaning the house, so that LBWIs' mothers could perform skin-to-skin contact.

### 3.1.3. Household works

Household works referred to everyday domestic chores or housework which must be done by LBWIs' mothers and responsibility for caring for other children. Eight LBWIs' mothers had problems performing skin-to-skin contact due to housework, such as cooking, cleaning the house, washing clothes, etc. When cooking, LBWIs' mothers would usually put their infants in bed, arguing that smoke from cooking could interfere with the infants' health. One noting: "If I want to cook, the infant was put in bed because I'm afraid of being hit by smoke" (LBWIs' mother, 25 years).

LBWIs' mothers usually had to finish the housework first before performing skin-to-skin contact. In the morning, they were busy to do the housework, therefore, they can perform skin-to-skin contact only in the afternoon. One noting: "In the morning I have to do all the housework, such as cooking, cleaning the house, washing clothes, etc, so I have no time to perform skin-to-skin contact. I can only perform skin-to-skin contact in the afternoon, after finished all the housework. Yeahh, about one until 2 h [perform skin-to-skin contact]" (LBWIs' mother, 36 years).

Five LBWIs' mothers had responsibility for caring for other children (the bigger children), such as assistance to make assignments, take the children to school, and preparing or feeding another child. These activities could impair the practice of skin-to-skin contact. One noting: "It's hard to perform skin-to-skin contact because I have other little children who must be cared for too" (LBWIs' mother, 25 years old). The problem will arise if the LBWIs' mothers had twins. Two LBWIs' mothers had twins where they had problems to perform skin-to-skin contact at the same time. They must take turns to perform skin-to-skin contact to the infants. This problem will be resolved if a family member came to give assistance to perform skin-to-skin contact in other sibling. One noting: "If my mother, sisters, or other relatives comes home, they can help me to perform skin-to-skin contact in other sibling" (LBWIs' mother, 34 years old).

### 3.1.4. Medical concerns

Medical concerns referred to the clinical or health condition of LBWIs' mothers and infants and perception of LBWIs' mothers that skin-to-skin contact will hurt infants and make them feel discomfort. The problems faced by mothers after delivery such as swollen ankle after a caesarean section, can reduce uptake of KMC. One of LBWIs' mothers in this study was hospitalized after delivery for quite a long time and the infant was taken care by her sister (aunty of the infant).

Other obstacles of skin-to-skin contact were perception of LBWIs' mothers that skin-to-skin contact will hurt infants and make infants discomfort. LBWIs' mothers feared that performing skin-to-skin contact would cause pain and discomfort to the infants. They perceived that the infants were inconvenient in skin-to-skin contacts' position. One noting: "The infant seemed feel discomfort to stick to my breast like this [skin-to-skin contact]. I'm afraid it will hurt him" (LBWIs' mother, 31 years

old).

### 3.2. recommendation from health workers for KMC implementation in the community

We identified two themes that describe the feasible solutions of KMC implementation in the community: community health workers empowerment and antenatal care awareness.

#### 3.2.1. Community health workers empowerment

Overall, barriers to KMC practice among LBWIs' mothers were related to time constraints in conducting KMC continuously. This problem could be overcome by assistance from others available to help the LBWIs' mothers. Mothers are encouraged to allow other people to remind, motivate, and help them carry out KMC, and this role can be filled by community health workers. One commented: "There should also be assistance from community health workers. At least there are people who remind LBWIs' mothers to practice KMC, there are people who can be asked if the LBWIs' mothers were confused. Because sometime there was a reluctant if LBWIs' mothers asked to health workers. The mothers feel closer to community health workers, more open ..." (Health worker, 30 years old)

The community health worker's role is very important, providing link between community and primary healthcare. This role is vital because of the following reasons: 1). community health workers are close to and familiar with the local community, 2). there are high workloads among health workers conducting home visits, 3). because of the obstacles encountered at home that differ from those in the hospital, mothers must be reminded to do KMC. One commented: "Yes, community health workers closer to the mothers ... Health workers were hard to rely on because they had many activities, a lot of work. It's better to involve community health workers in KMC practice in the community, so the primary health center was helped too" (Health worker, 38 years old)

#### 3.2.2. Antenatal care awareness

Another solution is educating mothers during pregnancy to create early awareness about KMC before the birth. So far, KMC education has only been carried out for LBWIs' mothers who give birth in hospitals or health facilities. There was no education for LBWIs' mothers who give birth at home. KMC education should also be carried out during antenatal care so both knowledge and awareness about KMC can be created earlier. One commented: "It's important to give awareness of KMC during antenatal care, so if the mothers had a premature infant, they knew how to take care of the infant. The KMC promotion can be given to the pregnant mothers in Posyandu [integrated health and family planning post]" (Health worker, 37 years old).

## 4. Discussion

Most studies of KMC are hospital-based (facility-based), concerning LBWIs, who are hospitalized or admitted to the neonatal intensive care unit (NICU). There is rarely research about the implementation and sustainability of KMC in the community (community-based/home-based) after patients are discharged. Research by the Partnerships for Enhanced Engagement in Research (PEER) in Indonesia (Bergh et al., 2018) had conducted to implement referral system of KMC implementation between Koja District Hospital, North Jakarta and primary health care in the region, but perceptions and practices of KMC among LBWIs' mothers after discharged from hospital are not yet known. No previous study in Indonesia has considered to identify barrier and facilitator among LBWIs' mothers after discharged from hospital. Therefore, this research was to identify barrier and facilitator factors for KMC practice among LBWIs' mothers who had been discharged from Koja District Hospital, North Jakarta, and determine feasible solutions for overcoming the barriers.

KMC in the community in this study was the practice of skin-to-skin contact conducted at home, after LBWIs' mothers were discharge from hospital. In this study, all of LBWIs' mothers were performing KMC after discharge from hospital, with the averages' duration was 3 h per day. But none did KMC continuously at home. Our findings are consistent with a pilot study in Ghana (Bazzano et al., 2012), in which none of the mothers carried out KMC continuously after being discharged from the hospital. In a community-based trial in Shivgarh, India, KMC was very well received, and the practice was almost universally applicable (i.e., for LBWIs and for normal-weight babies). KMC practice among LBWIs' mothers in the community was also reported from other studies, which showed that this method was acceptable to mothers and family members (Rasaily et al., 2017; Opara and Okorie, 2017).

The existence of supportive factors may increase KMC practice in the community. In this study, supportive factors included: buy-in and bonding (acceptance of KMC and its benefits) and family support (encouragement and aid in performing KMC). These findings were consistent with other studies, which have indicated that knowledge and awareness of KMC benefits will increase KMC implementation in communities (Darmstadt et al., 2006; Mazumder et al., 2018; Alenchery et al., 2018; Nguah et al., 2011; Nirmala et al., 2006). A study in India showed that awareness of KMC benefits will be realized in practice, as mothers agreed that KMC was beneficial for helping infants develop and gain weight (Mazumder et al., 2017). Other studies in India found that KMC is thought to prevent hypothermia in newborns, improve mothers' ability to protect their babies from evil spirits, and make babies more comfortable (Darmstadt et al., 2006). In Ghana, almost all respondents thought KMC was beneficial for mothers and babies; they were willing to practice it and would recommend it to other mothers (Nguah et al., 2011).

Support from family, friends, and other mothers was the top KMC support in a systematic review of KMC implementation for preterm babies (Seidman et al., 2015; Chan et al., 2017; Smith et al., 2017). Other studies of family support for KMC were also conducted in India and Nigeria (Mazumder et al., 2018; Opara and Okorie, 2017). It is an Indian cultural practice for mothers, who have just given birth, not to do housework, and the willingness of other family members to help is a supporting factor for KMC implementation in the community. In fact, family members assisting with household work is the most common KMC support (Opara and Okorie, 2017). Another study in India found that family members helping with household responsibilities and performing KMC were the most important supports of KMC practice (Dawar et al., 2019).

Support from health workers was the fourth-highest support for KMC practice, based on the systematic review of KMC implementation in preterm babies (Seidman et al., 2015). Being educated by health workers will increase mothers' knowledge, positive attitudes, and confidence in doing KMC. When LBWIs' mothers are educated about KMC in the hospital, they will implement KMC at home. This is consistent with another study in Ghana, where LBWIs' mothers continued to practice KMC in the community after being discharged from two hospitals in Kumasi, Ghana (Opara and Okorie, 2017). Similarly, Nigerian LBWIs' mothers, who had practiced KMC in a tertiary health institution in Southern Nigeria, continued to practice KMC in the community (Nguah et al., 2011). Another support was health workers offering KMC education during postnatal care, as evidenced in India, where trained health workers provided Information, Education, and Communication (IEC) on KMC during the antenatal period, along with essential newborn care messages; these messages were reinforced during the postnatal period to increase KMC acceptability (Rasaily et al., 2017).

Barrier factors can affect LBWIs' mothers in implementing KMC in the community, especially continuously. Other studies have reported barrier factors of KMC as LBWIs' mothers needing rest after delivery (Mazumder et al., 2018), postpartum pain, fear of harming the umbilicus, traditional carrying practices, lack of back support, time constraints, and breast feeding issues (Bazzano et al., 2012; Lim, 2018).



However, this study found other barriers related specifically to local contexts. Here, barrier factors included household works (domestic chores, caring another children) and medical concerns (health condition of LBWIs' mothers and infants and perceived that KMC will hurt infants and make infants discomfort). These findings are consistent with other studies in India and Nigeria, where most LBWIs' mothers lived in nuclear families and had to perform household work and look after older children. Hence, they could not provide KMC for a longer time (Rasaily et al., 2017; Opara and Okorie, 2017). Lack of help with KMC practice and other obligations (mothers' daily routines) was fourth of the top five barriers to KMC practice based on a recent systematic review of KMC implementation in preterm babies (Seidman et al., 2015). Babies' discomfort also led to early KMC discontinuation. As babies grew older, they became restless and tried to push themselves away (Parikh et al., 2013). It was difficult to hold them in the KMC position, and, therefore, the mothers were forced to discontinue it. Bigger babies generally give this signal sooner, while smaller babies are comfortable being held in the KMC position for a longer time (Parikh et al., 2013).

Appropriate solutions will increase KMC success in the community. Based on the KMC barriers in this pilot study, several recommendations from the health workers are offered, including: community health workers empowerment and antenatal care awareness. Social support refers to assistance received from other people in performing KMC (Chan et al., 2016). Support from community health workers was the fourth-highest KMC enabler based on the KMC systematic review (Seidman et al., 2015). LBWIs' mothers understood the KMC messages delivered by community health workers in a community setting in Bangladesh and enhanced their adherence to practice (Quasem et al., 2003). Communities can complement a facility-based approach to scale-up community engagement activities, drive demand for KMC practice, and ensure infants receive quality KMC care (Seidman et al., 2015).

Recommendations for implementing KMC in the community in this study are consistent with a systematic review of community support for KMC implementation (Chan et al., 2016); a study in Ghana (Bazzano et al., 2012)—which encouraged promotion of KMC practice in the community and allowing other people to assist LBWIs' mothers with implementing KMC; and a study in India (Alenchery et al., 2018)—which encouraged increasing awareness among pregnant mothers via antenatal education. KMC must be highly promoted. Thus, negative perception could be reduced and mothers could be educated to be more confident KMC practitioners with adequate knowledge (Utami, 2019).

#### 4.1. Limitations of the study

Although in-depth interviews was intended to LBWI's mothers, family members such as husbands and grandmothers occasionally was present. This could influence LBWI's mothers to express their opinions and experiences freely. Further, these findings represent the experiences of KMC among LBWIs' mothers at both Koja and Cilincing sub districts in North Jakarta, a region with densely populated with lower socio-economic background. This condition may not reflect the other region in implementing KMC in the community. Finally, this study used a small sample, which resulted in limited data variation and thematic saturation was reached early.

#### 5. Conclusion and recommendations

This study provided a set of synthesized factors regarding barriers and facilitators of KMC implementation among LBWIs' mothers in a community setting in North Jakarta, Indonesia. Our findings indicate that this experience is influenced by some factors of barriers and facilitators, such as buy-in and bonding, family support, household works, and medical concerns. The feasible solutions obtained from this study for overcoming these barriers were community health workers

empowerment and antenatal care awareness. By identifying these barriers and facilitators as well the recommendations, this study could be used to design interventions suitable to the implementation of KMC in the community.

#### Ethical clearance

The study design and procedures were approved by the Ethical Review Board of the Faculty of Public Health, Universitas Indonesia (Ref No.767/UN2.f10/PPM.00.02/2018), dated December 10th, 2018.

#### Declaration of competing interest

None.

#### Acknowledgements

We would like to thank the North Jakarta Health Office to conduct this research. In addition, we appreciated the Directorate of Research and Community Engagement of Universitas Indonesia which provided funding for this research (grant number (BA-338/UN2.R3.1/PPM.00.03.01/2019)).

#### References

- Ahmed, S., Mitra, S.N., Chowdhury, A.M.R., Camacho, L.L., Winikoff, B., Sloan, N.L., 2011. Community kangaroo mother care: implementation and potential for neonatal survival and health in very low-income settings. *J. Perinatol.* 31 (5), 361–367. <https://doi.org/10.1038/jp.2010.131>.
- Alenchery, A.J., Thoppil, J., Britto, C.D., de Onis, J.V., Fernandez, L., Suman Rao, P.N., 2018. Barriers and enablers to skin-to-skin contact at birth in healthy neonates - a qualitative study. *BMC Pediatr.* 18 (1). <https://doi.org/10.1186/s12887-018-1033-y>. 11-0.
- Bailey, S., 2012. Kangaroo mother care: implementation guide. *The Maternal and child health integrated program (MCHIP)*. USAID 73, 278–281. [https://doi.org/10.1016/S0140-6736\(05\)70336-6](https://doi.org/10.1016/S0140-6736(05)70336-6).
- Bazzano, A., Hill, Z., Tawiah-Agyemang, C., Manu, A., ten Asbroek, G., Kirkwood, B., 2012. Introducing home based skin-to-skin care for low birth weight newborns: a pilot approach to education and counseling in Ghana. *Global Health Promotion* 19 (3), 42–49. <https://doi.org/10.1177/1757975912453185>.
- Bergh, A., Rogers-Bloch, Q., Pratomo, H., Uhujiyah, U., Poernomo, I., Sidi, S., Rustina, Y., 2018. Progress in the implementation of kangaroo mother care in 10 hospitals in Indonesia. *J. Trop. Pediatr.* 58 (5), 402–405. <https://doi.org/10.1093/tropej/fmr114>.
- Boundy, E.O., Dastjerdi, R., Spiegelman, D., Wafia, W., 2016. Kangaroo mother care and neonatal outcomes : a meta-analysis. *Pediatrics* 137 (1), e20152238. <https://doi.org/10.1542/peds.2015-2238>.
- Chan, G., Bergelson, I., Smith, E.R., Skotnes, T., Wall, S., 2017. Barriers and enablers of kangaroo mother care implementation from a health systems perspective: a systematic review. *Health Policy Plan.* 32 (10), 1466–1475. <https://doi.org/10.1093/heapol/czx098>.
- Chan, G.J., Labar, A.S., Wall, S., Atun, R., 2016. Kangaroo mother care: a systematic review of barriers and enablers. *Bull. World Health Organ.* 94 (2), 130–141. <https://doi.org/10.2471/BLT.15.157818>.
- Darmstadt, G.L., Kumar, V., Yadav, R., Singh, V., Singh, P., Mohanty, S., et al., 2006. Introduction of community-based skin-to-skin care in rural Uttar Pradesh, India. *J. Perinatol.* 26 (10), 597–604. <https://doi.org/10.1038/sj.jp.7211569>.
- Dawar, R., Nangia, S., Thukral, A., Chopra, S., Khanna, R., 2019. Factors impacting practice of home kangaroo mother care with low birth weight infants following hospital discharge. *J. Trop. Pediatr.* 1–8. <https://doi.org/10.1093/tropej/fmz007>.
- Indonesian Ministry of Health, 2009. Kangaroo Mother Care Healthcare Guide for Low Birth Weight Babies in Hospital and its Network Directorate General of Medical Services Development, Jakarta, 978-979-9254-73-3pp. 57. <http://perpustakaan.depkes.go.id:8180/handle/123456789/562>.
- Jakarta Capital Special Region Health Office, 2017. *Profile Of Jakarta Capital Special Region Province Year 2017*. Jakarta, Planning and Financing Unit of Jakarta Capital Special Region Health Office. pp. 131. [http://www.depkes.go.id/resources/download/profil/PROFIL\\_KES\\_PROVINSI\\_2016/11\\_DKI\\_Jakarta\\_2016.pdf](http://www.depkes.go.id/resources/download/profil/PROFIL_KES_PROVINSI_2016/11_DKI_Jakarta_2016.pdf).
- Lawn, J.E., Gravett, M.G., Nunes, T.M., Rubens, C.E., Stanton, C., GAPPS Review Group., 2010. Global report on preterm birth and stillbirth (1 of 7): definitions, description of the burden and opportunities to improve data. *BMC Pregnancy Childbirth* 10 (Suppl. 1). <https://doi.org/10.1186/1471-2393-S1-S1>. S1.
- Lim, S., 2018. Neonatal nurses' perceptions of supportive factors and barriers to the implementation of skin-to-skin care in extremely low birth weight (ELBW) infants - a qualitative study. *J. Neonatal Nurs.* 24 (1), 39–43. <https://doi.org/10.1016/j.jnn.2017.11.010>.
- Mazumder, S., Taneja, S., Dalpath, S.K., Gupta, R., Dube, B., Sinha, B., et al., 2017. Impact of community-initiated kangaroo mother care on survival of low birth weight infants:

- study protocol for a randomized controlled trial. *BMC Trials* 18 (1), 262. <https://doi.org/10.1186/s13063-017-1991-7>.
- Mazumder, S., Upadhyay, R.P., Hill, Z., Taneja, S., Dube, B., Kaur, J., et al., 2018. Kangaroo mother care: using formative research to design an acceptable community intervention. *BMC Public Health* 18 (1), 307. <https://doi.org/10.1186/s12889-018-5197-z>.
- Nguah, S.B., Wobil, P.N.L., Obeng, R., Yakubu, A., Kerber, K.J., Lawn, J.E., Plange-Rhule, G., 2011. Perception and practice of kangaroo mother care after discharge from hospital in Kumasi, Ghana: a longitudinal study. *BMC Pregnancy Childbirth* 11 (1), 99. <https://doi.org/10.1186/1471-2393-11-99>.
- Nirmala, P., Rekha, S., Washington, M., 2006. Kangaroo mother care: effect and perception of mothers and health personnel. *J. Neonatal Nurs.* 12 (5), 177–184. <https://doi.org/10.1016/j.jnn.2006.07.008>.
- Opara, P.I., Okorie, E., 2017. Kangaroo mother care : mothers experiences post discharge from hospital. *J.Pregnancy.Neonatal Med.* 1 (1), 16–20.
- Parikh, S., Banker, D., Shah, U., 2013. Barriers in implementing community based kangaroo mother care in low income community. *NHL J. Med. Sci.* 2 (1), 36–38.
- Quasem, I., Sloan, N.L., Chowdhury, A., Ahmed, S., Winikoff, B., Chowdhury, A.M.R., 2003. Adaptation of kangaroo mother care for community-based application. *J. Perinatol.* 23 (8), 646–651. <https://doi.org/10.1038/sj.jp.7210999>.
- Rasaily, R., Gangul, K.K., Roy, M., Vani, S.N., Kharood, N., Kulkarni, R., et al., 2017. Community-based kangaroo mother care for low birth weight babies: a pilot study. *Indian J. Med. Res.* 145, 51–57. <https://doi.org/10.4103/ijmr.IJMR.603.15>.
- Seidman, G., Unnikrishnan, S., Kenny, E., Myslinski, S., Cairns-Smith, S., Mulligan, B., Engmann, C., 2015. Barriers and enablers of kangaroo mother care practice: a systematic review. *PLoS One* 10 (5), 1–20. <https://doi.org/10.1371/journal.pone.0125643>.
- Sloan, N.L., Ahmed, S., Mitra, S.N., Choudhury, N., Chowdhury, M., Rob, U., Winikoff, B., 2008. Community-based kangaroo mother care to prevent neonatal and infant mortality: a randomized, controlled cluster trial. *Pediatrics* 121 (5), e1047–e1059. <https://doi.org/10.1542/peds.2007-0076>.
- Smith, E.R., Bergelson, I., Constantian, S., Valsangkar, B., Chan, G.J., 2017. Barriers and enablers of health system adoption of kangaroo mother care: a systematic review of caregiver perspectives. *BMC Pediatr.* 17 (1), 1–16. <https://doi.org/10.1186/s12887-016-0769-5>.
- Swarnkar, K., Vagha, J., 2016. Effect of kangaroo mother care on growth and morbidity pattern in low birth weight infants. *J. Krishna Inst. Med. Sci. Univ.* 5 (1), 91–99.
- Utami, S., Mei-Chih, H., 2019. Health care providers' perception, knowledge, barriers and practice of kangaroo care for preterm baby in Indonesia. *Articles i. J. Neonatal Nurs.* <https://doi.org/10.1016/j.jnn.2019.03.003>. (accepted, under review).
- WHO, 2003. Kangaroo mother care: a practical guide. WHO 351, 54. [https://doi.org/10.1016/S0140-6736\(05\)70336-6](https://doi.org/10.1016/S0140-6736(05)70336-6).