


# Feasibility of Kangaroo Mother Care (KMC) Implementation in Depok City, Indonesia

Global Pediatric Health  
Volume 8: 1–8  
© The Author(s) 2021  
Article reuse guidelines:  
sagepub.com/journals-permissions  
DOI: 10.1177/2333794X211012390  
journals.sagepub.com/home/gph  


Tiara Amelia<sup>1</sup> , Hadi Pratomo<sup>1</sup> , Asri C. Adisasmita<sup>1</sup>, Evi Martha<sup>1</sup>,  
Yeni Rustina<sup>1</sup>, Ade Iva Murty<sup>2</sup> , Indri Hapsari Susilowati<sup>1</sup>,  
Eviana S. Tambunan<sup>3</sup>, and Indah Jamiatun Hasanah<sup>1</sup>

## Abstract

**Background:** The infant and neonatal mortality rate in Depok City is still high, with low birth weight (LBW) and premature births being one of the main causes. In 2018, 14 out of 41 cases of early neonatal death were due to LBW. Studies show that Kangaroo Mother Care (KMC) can prevent or reduce LBW deaths caused by hypothermia, but the implementation is still not evenly distributed. **Objective:** Describe KMC feasibility as a supporting material for a KMC policy umbrella at Depok City. **Method:** Qualitative research was conducted with a Rapid Assessment Procedure (RAP) design. A total of 56 informants were divided into 8 discussion groups, 7 in-depth interviews and 2 Focus Group Discussions (FGD). The types of informants were families and inter-sectoral officers. Thematic analysis was used to analyze the data. **Results:** KMC implementation feasibility in Depok City in terms of facilities and infrastructure was still limited and the quality was insufficient. The number of human resources was still limited, and the competency was still not evenly distributed. LBW family readiness can be maintained if provided with complete and accurate knowledge; therefore, a strong commitment may develop to continue KMC at home. The potential sources of KMC financing are found at health facilities and inter-sectoral; however, to use it, a legal umbrella at the city district level is necessary. **Conclusions:** The factors of potential financing sources need to be followed up into a priority. This is to overcome the constraints of KMC feasibility implementation.

## Keywords

feasibility, kangaroo mother care, low birth weight, neonatal policy

Received February 22, 2021. Received revised April 15, 2021. Accepted for publication March 30, 2021.

## Introduction

The under-five and infant mortality rate in Indonesia has decreased, but the mortality rate of infants aged 0 to 28 days (neonatal period) has not declined or has remained stagnant. The causes of neonatal deaths in Indonesia are Low Birth Weight (LBW) or prematurity, respiratory failure, and infection. Hypothermia is one of the causes of LBW/premature deaths, where the temperature regulation center of premature infants has not yet developed.<sup>1</sup>

Meanwhile, data at Depok City Hospital showed that in 2018, 126 infants were born in LBW condition with 9 perinatal deaths (deaths between 20 weeks of gestation and 0-7 first days of life). One of the causes of LBW and premature infant deaths is that the temperature control center of infants has not perfectly

developed yet and infants can die of hypothermia (infant temperature is less than 97.7°F, normal infant temperature is 97.7°-99.5°F).<sup>2</sup>

Kangaroo Mother Care (KMC) can save the life of premature infants with LBW, increase the use of breast milk, reduce morbidity and mortality, and improve the quality of life. The literature review showed that providing KMC to infants in the first week of life could be 51%

<sup>1</sup>Universitas Indonesia, Depok, West Java, Indonesia

<sup>2</sup>Universitas Pancasila, Jakarta, DKI Jakarta, Indonesia

<sup>3</sup>Health Polytechnic of Jakarta 3 Ministry of Health, Bekasi, West Java, Indonesia

## Corresponding Author:

Tiara Amelia, Faculty of Public Health, Universitas Indonesia, D Building 1st Floor Kampus UI, Depok, West Java 16424, Indonesia.  
Email: tiara.a@ui.ac.id



significant in reducing neonatal mortality (RR 0.49; 95% CI: 0.29, 0.82—high GRADE quality) when compared to standard care.<sup>3</sup> Based on this data, if more hospitals/regional hospitals and public health center service networks carry out KMC properly and correctly, this would certainly have an impact on the life quality of infants and highly determines the life quality of future generations.

In 1979, LBW care using KMC was introduced by Dr. Edgar Rey and Dr. Hector Martínez, who were both pediatricians who worked at Bogota Hospital, Colombia. In 1983, the World Children's Health Organization (UNICEF) began introducing this method to other countries, including Indonesia.<sup>4</sup> KMC is the skin-to-skin contact care for newborns to obtain warmth from the body of a mother. KMC is a way of caring for LBW infants, just like kangaroos care for their babies that are always born prematurely. Baby kangaroos stay in their mother's pouch for as long as needed to get warmth and breast milk.<sup>5</sup>

Most of the evaluated studies showed that premature infants that were cared for using KMC gained more weight.<sup>6</sup> Furthermore, these 2 researchers stated that KMC is low technology with low-cost capital. KMC can also facilitate premature infants to gain weight even in low resource settings. A study found that KMC was able to increase the weight of LBW/premature infants at the hospital, and there was also an increase in breastfeeding and exclusive breastfeeding provision.<sup>7</sup>

KMC consists of 4 components: kangaroo position (skin-to-skin contact), kangaroo nutrition (breast milk provision or breastfeeding), kangaroo discharge (preparation before leaving the hospital by educating mothers and their family on KMC), and kangaroo support (support from mothers of KMC fellow users). The kangaroo position places the baby in an upright position on the mother's chest, between the mother's breasts without any clothes on. The baby is left naked wearing diapers only, socks and a hat so there is as broad contact as possible between the skin of baby and mother. The position of the baby is secured with a long cloth or other binding. The head of the baby is turned to the right or left side, with a slightly extended position. With this position, the baby will receive warmth from their mother/substitute mother and be prevented from death due to hypothermia, which is a body temperature of less than 97.7°F, while the normal body temperature should be 97.7°F to 99.5°F.<sup>7</sup>

The Ministry of Health of the Republic of Indonesia has issued a policy related to KMC, including Guidelines for Mother and Infant Care Hospitals (RSSIB), Guidelines for Comprehensive Obstetric and Perinatal Emergencies (PONEK), Basic Obstetric and Neonatal Emergencies (PONED), and National Neonatal Health Action (INAP), but due to decentralization policies as

well as minimum service standards (SPM), the implementation of central policies highly depends on the policies of regional leaders.

In 1997, the Indonesian Society for Perinatology (Perinasia) introduced KMC for the first time in Indonesia.<sup>8</sup> As KMC became known in Indonesia and its benefits were recognized, the Ministry of Health of the Republic of Indonesia (Decree No. 603 of 2008 of the Ministry of Health of the Republic of Indonesia) adopted a health service policy that integrated KMC in various documents, namely RSSIB, Guidelines for KMC Services in Type D and C Hospitals, PONEK, and PONED. Even in the same year, the Ministry of Health of Indonesia also issued a policy for the formation of a KMC National Working Group (*Pokjanas*) and under the Directorate of Family Health at the Ministry of Health (in which there is a neonatal and infant sub-division); active KMC training activities were carried out in various large hospitals. However, the exact information on how many hospitals carried out KMC was not clear. The data of hospitals that carried out KMC showed there were no hospitals that carried out KMC consistently for 24 hours (continuously). Factors that affected this included the absence/lack of policy support and competence, as well as the motivation of health workers to carry out KMC.

The Mother and Infant Care Hospital/ RSSIB Program has been developed in Depok City since 2001.<sup>9</sup> Several policies related to maternal, infant, and child health were also available, such as the Depok City Regional Regulation (Perda) No. 15 (2013) regarding Child Friendly City and Depok City Regional Regulation No. 2 (2015) concerning Health of Mothers, Newborns and Under-Fives (KIBBLA). Among these policies, there was no specific policy regarding the regulation of LBW and KMC. Considering the importance of KMC in LBW care, efforts are needed to formulate the KMC policy at Depok City. As a first step, a preliminary study was needed, which aimed to explore the feasibility of implementing KMC in term of facilities and infrastructure, readiness of LBW families, human resources and potential sources of financing.

## Method

This research was carried out at public and private hospitals in Depok City. Rapid Assessment Procedure (RAP) was the approach used in this qualitative research. The informants in this study were 1 public hospital and 2 private hospitals, PONED Public Health Center, Depok City Health Office, Agency for Regional Development (Bappeda), National Health Insurance (BPJS), professional organizations and LBW families. The total number of data collection methods used was 8

group discussions (2-5 people), 7 in-depth interviews and 2 focus group discussions. Each informant signed an informed consent form after obtaining an explanation of the rights and research ethics. Semi-structured interview guidelines were used in data collection, and the interview duration was 60 to 75 minutes, while FGDs were held for 100 minutes. Triangulation of methods, sources, and analysis were used to validate the obtained data. The data were analyzed by using thematic analysis.

## Results

The feasibility of implementing KMC in Depok City was discussed in general from the aspects of potential facilities and infrastructure, human resources, and family readiness. In addition, the potential financing sources to support comprehensive and integrated KMC implementation. The following description is supporting factors on the feasibility of KMC in Depok City.

### *KMC Facilities and Infrastructure*

The availability of facilities and infrastructure for KMC implementation at various health service facilities in Depok City in general were inadequate, such as in private hospitals, government hospitals, and PONEC. Inadequate facilities and infrastructure for KMC implementation that were unavailable, such as special rooms for continuous KMC, facilities for intermittent KMC, KMC clothes (kangaroo gown) are not evenly available and Neonatal Intensive Care Unit (NICU) room was also unavailable.

The health service facility, which became the research location, did not have a specific room for KMC. Nevertheless, health workers at the hospital still urged and encouraged mothers and their infants to carry out KMC by using facilities related to existing mother and childcare rooms such as lactation rooms and perinatology rooms for mothers and infants to at least still do intermittent KMC.

Another limitation of KMC implementation in health care institutions is the availability of KMC clothes that mothers can use to practice KMC at home. In theory, there is no need for special KMC clothes, meaning that there is no need for a special KMC gown because an everyday available scarf or cloth can be used as a support binder (carrier). However, the presence of this KMC gown is considered quite important because it can make the mother or family feel safe. Government hospitals provide KMC clothes, which can only be used during treatment at the hospital. These clothes cannot be brought home, which becomes a problem when the LBW mother returns home and must continue with KMC. Without KMC clothes from the hospital, the

mother feels that she is not doing KMC at home in accordance with the procedure.

On the other hand, private hospitals that do not provide special KMC clothes will teach LBW mothers using the sling cloth that mothers usually use at home. In this case, the absence of KMC clothes does not become such a problem because LBW mothers can still use their sling cloth to carry out KMC at home.

### *Readiness of Low Birth Weight Families*

The readiness of LBW families to continue KMC at home is one of the issues that determine successful of KMC's implementation. LBW mothers and families are more prepared to do KMC if supported by sufficient knowledge and understanding. This does not only apply to the mother figure but also for family members such as the husband and parents who live in the same house. These issues also depend on information and communication from health workers during their hospitalization. If the information and communication of health workers are comprehensive and intense enough, the family will be more confident and motivated to continue KMC at home.

The 2 LBW mothers who were informants in this study had a strong desire to continue KMC at home. Both have quite high educational backgrounds and are accustomed to searching for information on the Internet. It was easy for both to understand the importance of KMC for infant care based on information from the Internet and from health workers. Even though in practice, the LBW mother from the government hospital was not in accordance with the procedure, she still continued with KMC. One of the reasons was that while in the government hospital, the mother were taught to use the borrowed KMC cloth. Meanwhile, at home, the mother did not have a KMC cloth and did not know other alternatives if there was no KMC cloth at home. Therefore, the health workers need to give an explanation and information about KMC cloth's substitute at home.

In addition, mothers of LBW patients from private hospitals seemed more ready to continue KMC at home, because while in the hospital, KMC was carried out using the mother's own sling cloth. Also, there was KMC counseling by health workers to mothers and families who accompanied them at the hospital. The family who accompanied the mother was her husband and mother-in-law, where due to the knowledge they received, she was ready to support KMC implementation at home. The husband provided support by replacing the mother doing KMC at night and motivating them to continue doing KMC. Meanwhile, the mother-in-law provided support by looking after the other children while the mother was carrying out KMC.

There was a different experience for the husband of a mother with an LBW patient in a government hospital who was less exposed to information on KMC. The husband left all matters of infant care to the mother, and she did not experience real support. The impact of counseling provided to mothers and husbands will certainly make a difference if the mother provides counseling to her husband. Therefore, the motivation of a mother really depends on her mental readiness, which requires a lot of time and energy to continue her commitment to carry out KMC.

Parental support was another influential family support at home. In this study, mothers-in-law live with their daughters-in-law to help manage the house. The mother-in-law of a private hospital patient attended KMC counseling while at the hospital; therefore, KMC exposure made the mother-in-law understand the importance of carrying out KMC for her grandchild while at home. The mother-in-law does not provide help on KMC for her grandchild, but she saw her daughter-in-law doing KMC with a positive attitude and behavior, which will certainly make the daughter-in-law comfortable because she feels understood.

This differs from the case of the mother-in-law of a government hospital patient, who had a negative experience. Moreover, the mother-in-law had children who were born premature and had the assumption that small babies are common so they do not need special treatment, which is also common. She had the impression that seeing her daughter-in-law doing KMC is troublesome, especially with a bare chest covered only by a blanket while doing KMC in the bedroom. The negative attitude and behavior of the mother-in-law will certainly affect the motivation of a mother to continue committing to KMC.

### *KMC Human Resources (HR)*

The implementation of KMC in Depok City is inseparable from the readiness of the quantity and quality of human resources. Depok City has all human resources related to KMC implementation in hospitals, POND Public Health Center, and KMC monitoring at home. Human resources in health care institutions are pediatricians, lactation specialists, perinatology nurses, public health center midwives, and Private Practice Midwives (BPM). Meanwhile, there is potential for human resources, namely health cadres for KMC implementation monitoring in the community. In terms of quantity, the number of human resources for health workers was still insufficient. The recruitment of health personnel itself still lacks the standardization required in the coaching pattern. In addition, not all available human resources have qualified competencies for KMC implementation. This causes KMC implementation by health

worker human resources to become diverse, which may have an impact on KMC practice by mothers with LBW babies at home. In general, problems in KMC implementation faced by human resources in Depok City are disordered competence and uneven distribution among health workers. The competence of health workers occurs in the form of knowledge, understanding, and practice. Incompetence causes disordered KMC practice starting from the hospital level, public health center and then to the community. Furthermore, health workers are less confident in KMC practice because they have never attended KMC training. Skills in providing information and counseling for mothers and families are also competencies that are still a problem. This will have an impact on the commitment and impression of KMC on mothers and families of LBW babies, especially on the continuity of KMC practice at home after hospitalization.

Measuring the success of KMC implementation is also an important issue in terms of KMC referrals, specifically regarding returning referrals from the hospital to the community. During the research, there were no human resources who specifically handled this returning referral, starting from the levels of the health office, hospital, or public health center. Due to the lack of rules that regulate KMC referrals, there was no connection with the human resources of health workers at multilevel health services. However, most health workers stated that communication and coordination between the health office, hospital, and public health center was important in monitoring the progress of LBW after returning from the hospital for early detection and prevention of infant mortality in the community or upon referring back to the hospital.

### *Potential KMC Financing Sources*

In terms of financing, there are several potential financing sources that can be used to support comprehensive KMC implementation, including tertiary, secondary, primary, and community health services. First, social assistance funds from Depok City Social Services can be used for KMC operational costs in hospitals, such as continuous operation of KMC and KMC clothes procurement. Second, the National Health Insurance/BPJS Kesehatan funds are available at the First Level Health Facility (FKTP) in the form of "*kontak sehat*" items (healthy contacts). One of the cost items within BPJS Kesehatan is used for giving health education to the community, KMC cloth procurement and operational costs for KMC monitoring and exclusive breastfeeding with LBW families by health workers in the community. Third, village funds for health cadres in the community at the district/sub-district government level can be used for operational costs for KMC monitoring and exclusive

breastfeeding. Fourth, funding from the Family Welfare Movement Team (*Tim Penggerak PKK*) and the Child and Community Empowerment Services can also be used for the training costs for health cadres regarding KMC and exclusive breastfeeding. Finally, the Depok City Health Office CSR fund can be used for providing health workers with technical guidance for newborn care (by including content on KMC and exclusive breastfeeding) specifically for midwives at the public health centers who will have a great role in KMC monitoring in the community.

## Discussion

### *Facilities and Infrastructure*

Facilities and infrastructure are important factors for KMC implementation. The facilities and infrastructure needed for KMC are not complicated and actually quite simple. For example, in India, which is also one of the developing countries that has implemented KMC, the preparation consists of simple tools that the mother can apply at home. The tools consist of a comfortable bed, baby pacifier, a chair, and KMC clothes that can be prepared by the family consisting of a sling cloth, blouse, baby socks, and a baby hat. As for health facilities, they can provide nasogastric tubes, sterilizing tools, weight scales, storage lockers, and entertainment facilities such as magazines, radio, TV, and sewing activities. Health facilities also need to provide a KMC room close to the infant room with good ventilation, heating if needed, and 1 bathroom for every 10 beds.<sup>10</sup>

In 2014, India published the KMC National Guidelines. One of the important points in the national guidelines for KMC in India was to recommend establishing KMC booths in health facilities, developing KMC practice guidelines, recommending NICU to have KMC units, and developing KMC application support.<sup>11</sup> Another guideline published by PPHI explained that the facilities and infrastructure needed for the KMC room are as follows: special cloths for carrying babies, beds, mattresses, sheets, diapers, waste baskets for dirty diapers, food containers, thermometers, baby scales, room heaters, KMC program forms, a refrigerator for milk storage, KMC registration, and KMC practice materials.<sup>12</sup>

The provision of KMC facilities and infrastructure in health facilities such as hospitals and public health centers are considered insufficient and inadequate. One of the obstacles is the absence of regulations at the city district level specifically regarding KMC; therefore, the implementation highly depends on the commitment of each health facility. The availability of facilities and infrastructure is closely related to the presence or

absence of supporting policies, such as a circular letter from the director or head of the health office or even a letter from the mayor. This is necessary because it is related to the provision of funding allocations for KMC in health facilities, which depends on whether there is a legal policy that becomes the foundation of funding allocation.

### *Family Readiness*

KMC practice not only requires motivation from the mother but also requires the impression that infant care at home using KMC is easy. Family readiness in implementing KMC can reduce or even eliminate the expensive need for LBW care, which can be implemented by families. The KMC method also helps parents and caregivers form an emotional bond with the infant.<sup>13</sup>

The implementation of KMC at home needs to be continued and implemented by mothers and families. Counseling regarding the practice of KMC needs to be provided before returning home.<sup>10</sup> Preparing families to implement KMC at home is also an activity to increase health knowledge for parents and the family of the infant, which can increase family confidence in caring for infants.<sup>14</sup> In addition, health workers also need to discuss a follow-up plan as a way of preparing and providing support to mothers and families.<sup>10</sup>

The next stage after counseling is the follow-up of KMC practices at home by officers in health facilities who can be replaced by the role of health cadres in Depok. Cadres who have been trained need to plan a scheduled follow-up visit to learn KMC practice sustainability at home. During follow-up, there are several items that need to be carried out, namely: infant weighing, monitoring KMC practices, conducting simple physical examinations of the infant, asking questions concerning maternal health, asking questions on whether they face any difficulties, and encouraging families to continue KMC practice.<sup>10</sup> Cadres can be a solution in overcoming the limited number of health personnel. However, they also need to be prepared with qualified competencies to monitor KMC carried out by mothers at home, including understanding the emergency conditions of LBW that must be immediately referred back to the hospital. Competencies that are just as important are skills in communicating and conducting counseling with LBW families to stay motivated and committed to continuing the KMC. The duration of KMC implementation at home requires a long period. Therefore, commitment is not only for the mother, but also for all family members in the same house. This competence is vital for cadres and will be part of the effort to prevent LBW deaths in the community after hospitalization.

## KMC Human Resources

Supporting factors of human resources have an influence on KMC implementation in Depok City. Depok City has all health workers related to KMC implementation at hospitals, PONEC Public Health Center, and available for monitoring at home. However, it is necessary to equalize the quality and quantity of human resource distribution to maximize KMC implementation. Based on the Kangaroo Mother Care Implementation Guide, KMC implementation requires skilled personnel to carry out KMC at health facilities, supervise KMC services, train parents, and conduct follow-up visits and community support after the mother and infant are discharged.<sup>15</sup>

Skilled personnel can assist in carrying out KMC in 7 stages: (1) Conduct administrative meetings for KMC preparation and raise support for KMC implementation. (2) The coordinator checks the facilities related to the preparation of KMC tools and rooms. (3) Conduct a meeting to form Standard Operating Procedure (SOP) with key staff for KMC implementation. (4) Provide KMC introduction to health workers. (5) Provide training for KMC management staff. (6) Develop an activity plan. (7) Conduct meetings to confirm planned activities.<sup>10</sup>

The importance of training for health workers to educate mothers and families can be carried out using the Behavior Change Communication (BCC) strategy. BCC starts with advocacy, training, education, and BCC implementation. This communication strategy needs to be implemented in Depok City to support ideal KMC implementation. This communication strategy can also increase awareness of KMC services provided at health facilities, as well as the importance of families accessing KMC services as early as possible.<sup>15</sup> This is in line with KMC implementation in India, where the presence of competent health workers can improve the practice of KMC in rural India.<sup>11</sup>

The training may consist of providing several educational opportunities on topics related to KMC implementation, such as: (1) the definition of KMC, (2) the benefits of KMC for infants, mothers, families, and health facilities, (3) improvement of KMC skills, (4) how to feed infants who cannot be breastfed, (5) coordinating the management of KMC at health facilities, and (6) preparing KMC implementation at health facilities. This training is recommended to be a special competency that KMC management staff must have. After the training is carried out, they must update knowledge, carry out reporting, monitor progress, analyze data planning, and conduct planned coordination meetings.<sup>10</sup>

KMC implementation in Depok City is recommended by involving health cadres to monitor KMC practices at

home. This is due to the limited number of health workers in health facilities. Thus, cadres need to understand the importance of their role in KMC sustainability at home and training on how to follow-up KMC practices at home. All cadres involved in KMC monitoring can utilize an online messenger application for reporting and monitoring follow-up activities by health workers. The items that need to be done during follow-up are weighing babies, monitoring KMC practices, carrying out simple physical examinations on babies, asking about maternal health, asking about difficulties faced, and encouraging mothers and families to continue practicing KMC.<sup>10</sup>

## Potential Financing Sources

The financing of KMC implementation is expected to be supported by various parties. The potential for funding will be realized when the stakeholders are positively committed to implementing KMC comprehensively in Depok City to reduce the infant mortality rate, especially during the neonatal period due to LBW, and preventing stunted growth caused by LBW. KMC implementation is one step in saving costs related to LBW infant care compared to conventional care using an incubator.<sup>10</sup>

The study showed that in clinical practice, KMC implementation can save health costs in less than 2 months. This was shown by the decreased length of stay, reduced use of incubators, and decreased consumption of antibiotics and milk formula for premature and LBW infants. The study also found that KMC implementation in the 12 largest hospitals in Nicaragua could save costs in less than 1 year. An investment of only about 0.007% of the national spending on health by the Nicaraguan government could result in substantial savings in a short period, so this study strongly recommends KMC implementation in health facilities.<sup>13</sup>

A randomized control trial study conducted on 141 LBW infants in India showed that KMC is an inexpensive and cost-effective method, making it suitable for implementation in developing and developed countries. This study showed savings in infant care costs up to 33 800 INR or IDR 6 542 304 in a group that applied KMC. In developing countries, the KMC may have a significant impact on the economy of parents of infants by reducing the use of NICUs and care costs.<sup>16</sup> Another study using a literature review method related to cost analysis and cost effectiveness of KMC implementation showed that KMC was 50% to 70% more cost-effective than total *Perawatan Ibu Anak* (PIA) or maternal and childcare. This was due to KMC implementation significantly reducing the length of care for infants compared to PIA. In addition, KMC saved the

cost of facilities, drugs, oxygen, and health resources in infant care.<sup>17</sup>

KMC implementation funding, starting from hospitals and health centers to the community, can use the potential sources of financing that are already available. This potential can be followed up in a more tangible way if it is also supported by the existing legal umbrella. KMC funding does not require a large cost but has a significant impact on preventing LBW mortality during the neonatal period. Also, it has an impact on cost savings on maternal and childcare is association with hospitalization, as has been proven in India and other references above.

## Conclusion

KMC implementation feasibility in Depok City, viewed from the perspective of the availability of facilities and infrastructure, family readiness, human resources, and potential sources of financing is very likely to be implemented. Constraints such as the availability of KMC facilities and infrastructure at multilevel health facilities and the number and competence of human resources regarding KMC can be resolved by developing KMC policies at the city district level. The developed policies can be the basis for funding allocation to the planned expenditure budget of each related agency, starting from the health office and its staff, hospitals, and related stakeholders such as National Health Insurance (BPJS). KMC could be promoted as one of the priority programs that provides an impact on preventing neonatal mortality and improves quality of life and has been proven to save the burden of government costs in terms of maternal and childcare in developing countries such as India.

## Acknowledgments

We would like to thank both the City Health Office and Regional Government Hospital of Depok City as our partners in this study. The active cooperation of the partners made this study possible. In addition, we appreciate the informants' cooperation and willingness to take part in this study. We would like to thank Ms. Ulfi Hida Zainita for updating more recent relevance literature and Mrs. Myranti for helping on writing first draft report in Bahasa Indonesia version.

## Author Contributions

TA conceptualized and designed the study, prepared the draft of the manuscript, and reviewed the manuscript. HP, principal investigator, led the data collection, advised on the data analysis and interpretation, and reviewed and approved the final manuscript. AA, EM, YR, AIM, HIS, EST, and IJH participated in the conceptualization of the study, led the data collection, data analysis, and reviewed the manuscript.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Funding


The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research was supported by an education fund from the Ministry of Finance Republic of Indonesia in 2019 with contract number 512/PKS/WR III/UI/20019 and PRJ-32/LPDP/2019.


## Ethical Clearance

This research has passed the ethical review by the Ethics Research Committee of the Faculty of Public Health, Universitas Indonesia, number 35/UN2.F10/PPM.00.02/2019, on November 25<sup>th</sup>, 2019.

## ORCID iDs

Tiara Amelia  <https://orcid.org/0000-0002-3820-9016>

Hadi Pratomo  <https://orcid.org/0000-0003-3468-5274>

Ade Iva Murty  <https://orcid.org/0000-0001-6128-1959>

## References

1. Ministry of Health RI. Keputusan Menteri Kesehatan RI tentang Pemberlakuan Pedoman Pelaksanaan Program Rumah Sakit Sayang Ibu dan Bayi. 603/MENKES/SK/VII/2008 Indonesia; 2008. Accessed January 20, 2021. <https://persi.or.id/wp-content/uploads/2020/11/kmk6032008.pdf>
2. Depok City Hospital. Data Kelahiran BBLR. 2019.
3. Lassi ZS, Middleton PF, Crowther C, Bhutta ZA. Interventions to improve neonatal health and later survival: an overview of systematic reviews. *EBioMedicine*. 2015;2:985-1000.
4. Martínez H. The mother Kangaroo method. Innovation for development and South-South Cooperation (IDEaSS). IDEaSS; 1997. 1-13. Accessed January 25, 2021. [http://www.ideassonline.org/pdf/br\\_11\\_37.pdf](http://www.ideassonline.org/pdf/br_11_37.pdf)
5. Sidi IPS, Rustina Y, Suradi R, Marnoto W, Uhudiah U. *Panduan Pelayanan Perawatan Metode Kanguru Di Rumah Sakit Tingkat Kabupaten*. Perkumpulan Perinatologi Indonesia; 2012.
6. Everekliyan M, Posmontier B. The impact of Kangaroo care on premature infant weight gain. *J Pediatr Nurs*. 2017;34:e10-e16.
7. Cunningham C, Moore Z, Patton D, O'Connor T, Nugent L. Does Kangaroo care affect the weight of preterm/low birth-weight infants in the neonatal setting of a hospital environment? *J Neonatal Nurs*. 2018;24:189-195.
8. Pratomo H. History of the development of Kangaroo mother care Indonesia. 2014.
9. Bappeda Kota Depok. *Data related with Kangaroo Mother Care Depok City*. Bappeda Kota Depok; 2020.

10. ACCESS. Kangaroo mother care: facilitator's guide. USAID; 2009. Accessed January 29, 2021. [https://pphisindh.org/home/pic/technicalresources/NewbornHealth/KMC/KMCFacilitator'sGuide\\_ACCESS.pdf](https://pphisindh.org/home/pic/technicalresources/NewbornHealth/KMC/KMCFacilitator'sGuide_ACCESS.pdf)
11. Save the Children. Kangaroo mother care in India. 2017. Accessed January 29, 2021. <https://www.healthynewborn-network.org/hnn-content/uploads/India-KAP-Summary-Sheet.pdf>
12. PPHI. Kangaroo mother care (KMC) -Implementation guidelines for PPHI health facilities. 2010. 1-4. Accessed January 29, 2021. [https://www.google.com/url?sa=t&source=web&rct=j&url=https://pphisindh.org/home/pic/technical%2520resources/Newborn%2520Health/KMC/KMC%2520Guidelines.pdf&ved=2ahUKEwic54C9ur3uAhXB7HMBHRJWDIsQFjAOegQIBBAB&usg=AOvVaw3flb2-TI\\_QVc01-cjl6pBr](https://www.google.com/url?sa=t&source=web&rct=j&url=https://pphisindh.org/home/pic/technical%2520resources/Newborn%2520Health/KMC/KMC%2520Guidelines.pdf&ved=2ahUKEwic54C9ur3uAhXB7HMBHRJWDIsQFjAOegQIBBAB&usg=AOvVaw3flb2-TI_QVc01-cjl6pBr)
13. Broughton EI, Gomez I, Sanchez N, Vindell C. The cost-savings of implementing Kangaroo mother care in Nicaragua. *Rev Panam Salud Publica/Pan Am J Public Heal.* 2013;34:176-182.
14. Uwaezuoke S. Kangaroo mother care in resource-limited settings: implementation, health benefits, and cost-effectiveness. *Res Rep Neonatol.* 2017; 7:11-18.
15. MCHIP. Kangaroo mother care (KMC) implementation guide. USAID; 2012. Accessed January 29, 2021. [https://www.mchip.net/sites/default/files/MCHIPKMCGuide\\_English.pdf](https://www.mchip.net/sites/default/files/MCHIPKMCGuide_English.pdf)
16. Sharma D, Murki S, Oleti TP. To compare cost effectiveness of 'Kangaroo ward care' with 'intermediate intensive care' in stable very low birth weight infants (birth weight < 1100 grams): a randomized control trial. *Ital J Pediatr.* 2016;42:1-6.
17. John D, Nimbalkar S, Zhou J, Shah K. Cost analysis, cost savings, and cost effectiveness analysis of Kangaroo mother care: a systematic review. Paper presented at: International Network in Kangaroo Mother Care. H M Patel Centre for Medical Care and Education. Italy. 2016. Accessed January 30, 2021. [https://www.researchgate.net/publication/310462197\\_Cost\\_analysis\\_cost\\_savings\\_and\\_cost\\_effectiveness\\_analysis\\_of\\_Kangaroo\\_Mother\\_Care\\_A\\_systematic\\_review](https://www.researchgate.net/publication/310462197_Cost_analysis_cost_savings_and_cost_effectiveness_analysis_of_Kangaroo_Mother_Care_A_systematic_review)