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Review Article

Kangaroo Method Care: Benefits, Proponents and Barriers: A Narrative Review

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Abstract

Babies with low birth weight (LBW) are the highest contributor to neonatal mortality rates. Kangaroo care is an effective, cost-effective nursing action recommended by WHO for the care of premature and LBW babies which can reduce neonatal morbidity and mortality. However, the scope of kangaroo care practice is still low. Various databases such as Scopus, PubMed, ProQuest, Google Scholar, and Science Direct have been used as research sources. The time span for the articles accessed ranged from 2014 to 2024. The benefits of kangaroo care can improve the growth of premature and LBW babies, increase breastfeeding, improve the physiological function of babies, reduce infant mortality rates and reduce stress of mothers of premature and LBW babies. Supporting factors for kangaroo care are government support and health service providers, community and socio-cultural support, knowledge and awareness of mothers and inhibiting factors are lack of infrastructure and health facilities, socio-economic and cultural problems, challenges for mothers of LBW babies and lack of knowledge and awareness of various related parties. Kangaroo method care is beneficial for babies and mothers of LBW babies and there are supporting and inhibiting factors in its implementation. This aimed to increase the coverage of kangaroo method care implementation so as to optimize the growth of LBW babies.

Keywords: Low birth weight babies; Supporters; Inhibitors; Kangaroo care method

Introduction

The global prevalence of low birth weight (LBW) is 15.5%, which means that ±20.6 million babies are born each year suffering from LBW (1). LBW babies are the highest contributor to neonatal mortality (1,2). Of the approximately 4 million neonatal deaths, premature and LBW babies account for more than one-fifth of the cases. Of this prevalence, 96.5% occurs in developing coun-

tries (1,3,4). Kangaroo Method Care (KMC) is an effective, cost-effective nursing action recommended by the WHO for the care of premature and LBW babies (3,5). This method is a skin-to-skin care of the baby on the mother's or family's chest which aims to increase body temperature, physiological stability, and overall baby development. KMC has not been implemented optimally, the scope of implementation is still low, because of the many factors that influence its implementation even though this care has been recommended by the WHO (3,6). The urgency of this review lies in the high neonatal mortality and morbidity, especially for premature and LBW babies, kangaroo care as an effective approach in handling premature and LBW babies, the scope of implementation is still low so that an evidence-based study is needed regarding the benefits of kangaroo care and factors that support and hinder its implementation.

This narrative review aimed to review journals on the benefits of KMC both in health facilities and community levels along with journals related to supporters and obstacles in the implementation of KMC so that policy recommendations can be prepared to increase the scope of implementation of kangaroo method care to optimize the growth and development of premature and LBW babies.

Search Methods

In this study, various databases such as scopus, PubMed, Science Direct, ProQuest and Google Scholar have been used as research sources. We employed a narrative review retrieval strategy. The time span for the articles accessed ranged from 2014 to 2024. The inclusion criteria cover articles on the benefits, proponents and bariers kangaroo method care, published in English and available in full-text format. The exclusion criteria cover articles in the form of single case studies, as well as editorial reviews or commentary. The study selection process was conducted by screening titles and abstracts. Next, the authors independently evaluated the full text of the studies based on the inclusion criteria.

Benefits of Kangaroo Method Care

a. Kangaroo Method Care and low birth weigth growth

Countries with limited resources can use KMC as an alternative treatment that has been proven to increase the weight of very low birth weight (VLBW) babies (7,8). This treatment is the best conventional method for LBW done intermittently while in the hospital or continuously when discharged from the hospital has been proven to increase growth (9). Peer support and the use of hyperthermia control devices are effective interventions to increase maternal confidence and parental compliance in carrying out KMC both while in the hospital and at home which can optimize the growth of LBW and that continue into adulthood by improving their functionality and quality of life (9–12).

KMC performed on neonates in the Neonatal Intensive Care Unit (NICU) is effective in increasing maternal attachment in mothers and babies which can increase breastfeeding activities and can increase the weight of premature and LBW babies even in babies with HIV-infected mothers (13–17). Case reports in Pakistan that KMC is a need today where prolonged skin-to-skin contact and exclusive breastfeeding can save neonates with gestational age less than 37 weeks and weight less than 2.5 kg from hypothermia, and increase weight leading to decreased mortality and morbidity (18).

b. Kangaroo Method Care and breast milk

Skin-to-skin contact given to newborns immediately and for a longer period of time increases breastfeeding success, encouraging newborns to breastfeed faster, more often, and for a longer period of time, this improves the breastfeeding skills of LBW babies (19–21). A mother's self-confidence to breastfeed greatly influences the provision of Exclusive Breastfeeding, by letting the baby as often and as long as possible in the mother's arms can increase the closeness of the mother and baby so that it gives the mother confidence to breastfeed both when in health services and when leaving the hospital (14,22). KMC in-

creases the rate of breastfeeding in LBW even with VLBW babies so that the promotion of KMC in the community is done because it increases the effectiveness of breastfeeding (21,23). In China, the implementation of intermittent KMC can almost double the provision of exclusive breastfeeding and breastfeeding at the time of discharge from the hospital for premature babies besides this method provides a feasible means to increase the possibility of premature babies receiving the benefits of exclusive breastfeeding. This is very important considering the level of exclusive breastfeeding in China is very low (24).

c. Kangaroo Method Care and physiological function of low birth weight

The rate of breastfeeding in LBW even with very low birth weight babies so that the promotion of KMC in the community is done because it increases the effectiveness of breastfeeding (21,23). In China, the implementation of intermittent KMC can almost double the provision of exclusive breastfeeding and breastfeeding at the time of discharge from the hospital for premature babies besides this method provides a feasible means to increase the possibility of premature babies receiving the benefits of exclusive breastfeeding. This is very important considering the level of exclusive breastfeeding in China is very low (24).

LBW babies are susceptible to complications such as hypothermia, sepsis, hypoxia, infection and physiological problems that can cause increased morbidity and mortality in babies. Continuous and intermittent KMC has been shown to improve physiological indices (heart rate, respiration and temperature) of LBW and is effective in increasing body weight in neonates in addition to conventional treatment (25). The average temperature of babies who receive kangaroo care is relatively stable and effective in increasing oxygen saturation, both given directly by the baby's mother and by a substitute while still paying attention to a safe position in terms of preventing intraventricular hemorrhage (26–29).

Premature weighing less than 2.5 kg with prolonged skin-to-skin contact and exclusive breastfeeding saved them from hypothermia and increased weight gain (18). Premature neonates who received kangaroo care for a prolonged period achieved full enteral feeding earlier, had better breastfeeding success, neurobehavioral performance, thermal control, and tissue oxygenation (19). A case report from Pakistan on the topic of kangaroo care is the need of the day where prolonged skin-to-skin contact and exclusive breastfeeding saved a neonate with gestational age less than 37 weeks and weight less than 2.5 kg from hypothermia (18).

Combining kangaroo care with music therapy with live performance is beneficial in physiological stability in premature and very premature infants (30). A meta-analysis of RCTs on the effect of kangaroo care in the NICU on physiological stress parameters of premature infants showed that kangaroo care in the NICU is a safe method that may have significant effects on several physiological parameters (heart rate, respiratory rate, oxygen saturation and body temperature) in premature infants (31).

d. Kangaroo Method Care and low birth weight Mortality

Immediate kangaroo care for infants weighing between 1.0 and 1.799 kg has been shown to be safe and can reduce mortality at 28 days compared to infants receiving conventional care with kangaroo care initiated after stabilization and may improve survival of LBW infants (32–34). The benefits of KMC in the COVID-19 Era also far outweigh the small risk of death from COVID-19. Preterm newborns are at risk, especially in low-and middle-income countries (LMICs), where the consequences of disruption are significant. Policymakers and health professionals need to protect services and ensure clearer messaging to keep mothers and babies together, even if the mother is SARS-CoV-2 positive (35). A case report from Pakistan reported that a premature baby born at 33 weeks of gestation weighing 1.3 kg was saved by the administration of KMC in a hospital in Lahore (18).

The Operationalizing Kangaroo Method Care Before Stabilization Amongst LBW neonates in

Africa study is assessing the effectiveness of KMC in reducing deaths among neonates before stabilization, a vulnerable population for whom the benefits are uncertain. The trial improves understanding of the pathways underlying the intervention's effects and will be one of the first to rigorously compare the incremental costs and cost-effectiveness of KMC relative to standard care. The findings are expected to be broadly applicable to hospitals in sub-Saharan Africa and south Asia, where three-quarters of neonatal deaths occur (36). The implementation study of KMC in Bangladesh also suggests that KMC is feasible in low-resource settings, as it has the potential to reduce preterm and LBW infant mortality (37).

A controlled trial of a community-based kangaroo care package to evaluate the effect of KMC on neonatal outcomes and neonatal mortality concluded that KMC is effective in preventing sepsis which in turn may improve survival of LBW newborns in LMICs worldwide (37,38). It is a cost-effective alternative for VLBW infants in resource-limited settings with evidence of improved weight gain, fewer complications of prematurity and lower mortality (7).

e. Kangaroo method care and stress of low birth weight mothers's

KMC affects the left frontal brain activation pattern that increases moderate to severe oxytocin levels and moderately decreases cortisol reactivity by accumulating neuro-maturation and neurobiology that reduce stress in mothers and babies (39,40). In addition, by carrying out kangaroo mother care can eliminate detrimental psychological stress and improve the sleep status of mothers of premature babies in the NICU after separation between mother and baby, thereby improving physical and mental health with lower stress levels in mothers who start KMC in the first week of their baby's life (41,42).

Parental mental health, parental sensitivity, and parent-infant interaction are important domains for developing a secure parent-infant relationship and may be affected by preterm birth and NICU stay, while parental participation in kangaroo care to foster positive parenting by providing a safe space for parents to interact creatively with their infants combined with music therapy may improve parental cognitive appraisal and indirectly influence attachment to their infants (43,44). KMC can increase mother-baby attachment thereby reducing maternal anxiety, this care is acceptable to mothers and can be continued at home (45).

A community-based kangaroo care home visit program can improve maternal resilience and preterm infant growth and development and substantially reduce the risk of moderate to severe maternal postpartum depressive symptoms, which is evidence supporting KMC as an intervention to be included in essential newborn care programs in LIMCs (21,46). Case report on a 37-years-old primiparous patient with comorbid postpartum depression and impaired maternal-infant bonding, anxiety first appearing around the time of delivery and major depression one month after birth reported the effectiveness of kangaroo care in overcoming postpartum depression and impaired maternal-infant bonding and reducing oxidative stress as one of the biomarkers of stress in premature neonates (47,48). Fig. 1 provides information on the conceptual model of the benefits of KMC.

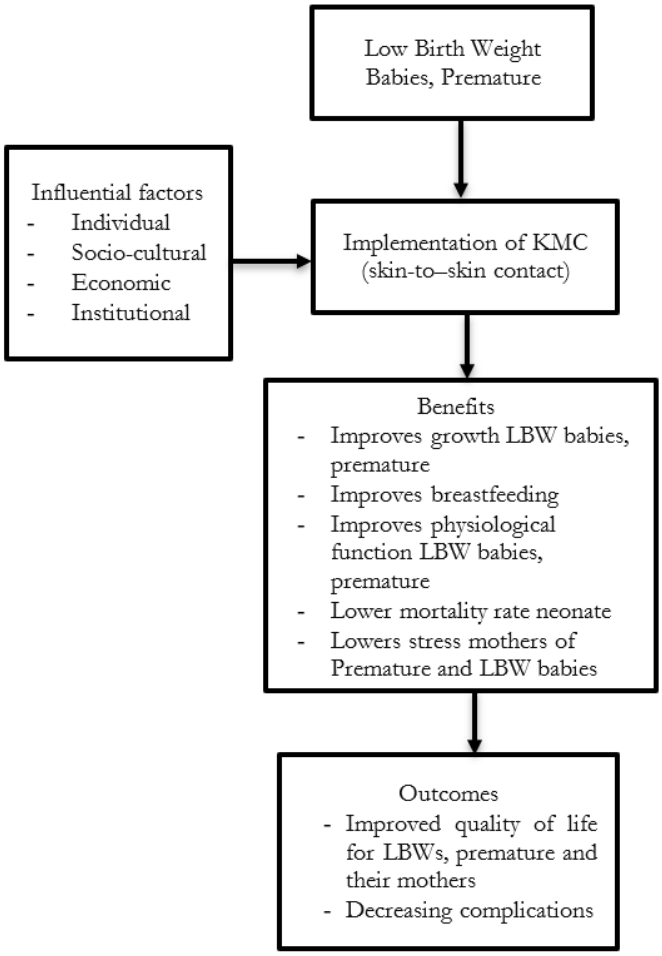

Fig. 1: Conceptual model benefit of KMC

Supporters and Barriers to Kangaroo Method Care

a. Supporters

Support from the government, health service providers, health managers in hospitals and communities is the most important thing in implementing and increasing the coverage of KMC both at the health facility level and in the community (49,50). Studies in Ethiopia, India and Pakistan suggest that increasing KMC in these countries is due to government support for KMC policies and improving referral systems (49,51,52). Social support from the government includes maternity leave policies, reliable access to hospitals through childcare services, accommodation and transportation and reducing burdensome costs (53). Implementation studies in Columbia and African countries on the implementation of KMC show the belief of health service providers about the importance of kangaroo care, the provision of training and supervision to health workers that support quality improvement in implementing kangaroo care (54).

Health workers' belief and skill that KMC is the standard of care for LBW (55–57). The presence of empathy, positive perception and positive support from nurses can increase the use of KMC in the NICU in Ethiopia and other LMCIs (49,58–60). The availability of sufficient health educators and KMC officers, especially with educational backgrounds related to neonatal health and the ability to transfer knowledge to mothers or fami-

lies who will provide KMC can improve KMC both in the NICU and continuing at home (34,61–63).

Family support, especially husbands, as well as mothers' good awareness and understanding of the importance of KMC can improve the implementation of KMC, both at health facilities and at home (49,63–65). Support from husbands, in-laws, and grandparents, as well as time for family visits and seeing peers practicing KMC improve practice at the hospital (49,63,66). The presence of health workers and positive attitudes of the community towards workers improve practice at home. Supportive communities and peer groups contribute to the implementation of KMC and mothers are also ready to provide intermittent community-based KMC (67).

Mothers' acceptance and understanding of KMC is one of the significant factors in increasing the implementation of KMC at home (49,63,68,69). Mothers' affection, quick information related to KMC, mothers' knowledge and skills and direct experience in KMC practice are supporting factors (34,70–72). Awareness, acceptance and mothers' implementation of KMC and perceived benefits increase the utilization of KMC at household level in LMICs (73–75).

b. Obstacle

Facilities and infrastructure are still limited with inadequate quality and lack of readiness of facilities to implement KMC (76–78). Limited human resources and uneven competence are obstacles to the implementation of KMC in Indonesia and rural Pakistan (79,80). Infrastructure in the form of inadequate beds, space, hand washing facilities and lack of privacy and comfortable care, the physical environment in the NICU and equipment problems for KMC practice are very limited (54,81,82). Private space for mothers is not available. In most health facilities, KMC is considered part of routine care and there is no policy available for its implementation (67,83). Adequate space and basic facilities useful for kangaroo positions are not provided or maintained properly (83,84).

Socio-cultural norms and practices are one of the barriers to the practice of KMC (51). KMC is considered culturally inappropriate because skin-to-skin contact occurs between the mother/father and the child. In addition, there is a common misconception that providing skin-to-skin care is the mother's role because she is the one who breastfeeds so that the father and other family members are not involved (37). Barriers to KMC practice are due to the assumption that carrying the baby on the front is traditionally unacceptable (81). In addition to social norms and practices, financial barriers were found in the practice of sustainable KMC (85). Financial barriers included accommodation costs for caregivers and costs for hospitalization as well as expensive accommodation and transportation (85,86).

Multidimensional challenges are experienced by mothers who carry out KMC in hospitals, although KMC is considered a simple intervention, but continuous KMC is difficult to practice (87). Kangaroo care is a tiring experience for mothers because they are in one position for a long time, sleep is disturbed, movement is limited, boredom, and isolation while in the hospital and there is a fear of nosocomial infection (67,87). Lack of support from fathers and families who are reluctant to provide kangaroo care increases the mother's workload, burdening mothers with household chores that prevent them from practicing KMC and lack of confidence in carrying babies in front are challenges for mothers in practicing KMC at the household level (37,80,88). Inadequate training of health workers, Lack of time/workload of health cadres and lack of family readiness for care of young babies are factors inhibiting the practice of KMC (51,79,89), families are not equipped with complete and accurate knowledge, Misunderstanding among health professionals and lack of belief in the efficacy and benefits of KMC, Considered as a burden on officers because it involves parents who must make agreements, feed, teach the correct method and follow-up so that it is considered as extra work for staff that is not beneficial to them (79,90). Lack of community awareness regarding care of young babies and the gap in knowledge, attitudes

and practices of KMC among parents of premature and LBW babies are challenges to the practice of KMC in the community (84,91).
Various barriers to KMC implementation indicate that the success of KMC is not only determined by clinical aspects but also influenced by economic and sociocultural aspects, indicating the need interventions that are not only educational but also structural both at the hospital and community levels. Future research is recommended to explore community-based intervention models combined with family empowerment strategies and more concrete policy support and sociocultural considerations prevailing in the community in supporting KMC practices to improve the coverage and quality of KMC implementation. Table 1 is a summary of supporting and inhibiting factors for KMC.

Table 1: Supporting and Inhibiting for KMC

Supporters	**Government and health service providers**
	The role of health workers
	Family, community and socio-cultural support
	Knowledge and awareness of mother and baby
Inhibitors	Lack of infrastructure and health service facilities
	Socioeconomic and cultural problems
	Challenges for mothers of premature and low birth weight babies
	Lack of knowledge and awareness of related parties

This narrative review provides a comprehensive synthesis of exiting evidence on the benefits, propenent and barriers of KMC, drawing from diverse sources and contextual settings. However, the review is limited by the availability and variability of published studies, some of which differ in methodological rigor and outcome measures, In addition, the review does not include unpublished data or grey literature, which may restrict the breadth of perspective. Despite these limitations, the findings offer valuable insights for strengthening KMC implementation, particularly in low-resource settings.

Conclusion

Kangaroo Method Care offers substantial benefits to LBW babies and their caregivers, yet several key barriers continue to limit its optimal implementation. Strengthening caregiver education, government support, health workers involvement, and community engagement is essential to improving the implementation of KMC.

Journalism Ethics Considerations

Ethical concerns (plagiarism, informed consent, error, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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Conflict of interest

The autors have no conflicts of interest related to this review article.

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