Universe International Journal of Interdisciplinary Research
(International Peer Reviewed Refereed Journal)
DOI No. – 08.2020-25662434

© UIJIR | ISSN (O) – 2582-6417
OCT 2024 | Vol. 5 Issue 5
www.uijir.com

KANGAROO MOTHER CARE:
A SYSTEMATIC REVIEW ON MATERNAL INFANT ATTACHMENT, MATERNAL STRESS AND GROWTH PARAMETERS AMONG THEIR LOW BIRTH WEIGHT NEONATES

Author's Name: Keziya Susan Babu[1], Prem Prakash[2], Aditya Pareek[3], Nitesh Dhiman[4], Dr. Meenu Paul[5], Swati Jaiswal[6]

Affiliation:

1. Principal, Grace Institutions, Bangalore, Karnataka, India.
2. Assistant Professor, JIET College of Nursing, Jodhpur, Rajasthan, India.
3. Associate Professor, Seedling School of Nursing, JNU, Jaipur, Rajasthan, India.
4. Assistant Professor, College of Nursing, Autonomous State Medical College, Firozabad, Uttar Pradesh, India.
5. Professor, Anushre College of Nursing, Jabalpur, Madhya Pradesh, India.
6. Nursing Tutor, Naraina Nursing College, Kanpur, Uttar Pradesh, India.

Corresponding Author Name and Email ID: Keziya Susan Babu , keziyababu87@gmail.com

ABSTRACT

Kangaroo Mother Care (KMC) is a widely practiced intervention aimed at promoting maternal-infant attachment, reducing maternal stress, and improving growth parameters in low birth weight (LBW) neonates. This systematic review synthesizes the existing evidence on the effects of KMC on these outcomes. A comprehensive search of major databases yielded 25 studies that met the inclusion criteria. The results suggest that KMC significantly improves maternal-infant attachment, reduces maternal stress, and enhances growth parameters in LBW neonates. The evidence supports the use of KMC as a valuable intervention for promoting maternal-infant attachment, reducing maternal stress, and improving growth outcomes in LBW neonates.Low birth weight and preterm birth are significant contributors to neonatal and infant mortality, with 15 million preterm babies born annually worldwide. In Spain, 30,000 premature babies are born each year, with 10% having a gestational age ≤ 32 weeks or birth weight ≤ 1500g. These infants are vulnerable to complications due to prematurity, and their care in neonatal intensive care units (NICUs) involves various stressors, such as noise, light, and separation from mothers, affecting neurodevelopmental outcomes. Limited interactions between mothers and babies can provoke anxiety, affecting maternal bonding and exacerbating the stressful experience of having a preterm baby. Stress activates the hypothalamus-pituitary-adrenocortical (HPA) axis, leading to cortisol secretion, an indicator of stress. Elevated cortisol levels can have side effects such as insulin resistance and behavioral disorders. Salivary cortisol measurement is a valuable tool for assessing stress regulation in preterm infants, despite limitations due to hyposalivation. Research suggests that

DOI Link :: https://doi-ds.org/doilink/10.2024-52741434/UIJIR

© UIJIR | ISSN (O) – 2582-6417
OCT 2024 | Vol. 5 Issue 5
www.uijir.com

skin-to-skin contact, such as the kangaroo method, can reduce stress in infants and lower cortisol levels, highlighting the importance of maternal contact in the first days and weeks of life. Kangaroo Mother Care (KMC) is a highly effective intervention that promotes maternal-infant attachment, reducing stress and anxiety in both mothers and babies. By holding their infants close to their bare chest, mothers can foster a deep sense of connection and security, leading to improved attachment outcomes. Research has consistently shown that KMC increases maternal-infant interaction, breastfeeding rates, and maternal confidence, while also reducing maternal stress and anxiety. Furthermore, KMC has been shown to have a positive impact on infant development, including improved cognitive and emotional development, and reduced risk of behavioral problems. Overall, KMC is a simple yet powerful tool that can have a lasting impact on the health and well-being of both mothers and babies, making it an essential component of maternal-infant care.

Keywords: Kangaroo Mother Care, Maternal-Infant Attachment, Maternal Stress, Growth Parameters, Low Birth Weight Neonates, Preterm Infants, Skin-to-Skin Contact, Breastfeeding, Neonatal Care, Maternal-Infant Bonding, Stress Reduction, Premature Birth, Neonatal Intensive Care Unit (NICU)

DOI Link :: https://doi-ds.org/doilink/10.2024-52741434/UIJIR

© UIJIR | ISSN (O) – 2582-6417
OCT 2024 | Vol. 5 Issue 5
www.uijir.com

INTRODUCTION

Low birth weight (LBW) neonates are at increased risk of morbidity and mortality, and require specialized care to ensure optimal growth and development. Kangaroo Mother Care (KMC) has emerged as a promising intervention to improve outcomes for LBW infants, but its effects on maternal-infant attachment, maternal stress, and growth parameters are not well understood.

Kangaroo Mother Care (KMC) is a simple, cost-effective, and accessible intervention that has revolutionized the care of low birth weight (LBW) neonates worldwide. Developed in the 1970s by Dr. Edgar Rey Sanabria in Colombia, KMC involves skin-to-skin contact between the mother and her new-born, frequent breastfeeding, and early discharge from the hospital. This approach has been shown to improve neonatal outcomes, reduce morbidity and mortality, and enhance the overall quality of life for LBW infants.

Despite its widespread adoption, the effects of KMC on maternal-infant attachment, maternal stress, and growth parameters in LBW neonates are not well understood. Maternal-infant attachment is a critical aspect of neonatal care, as it lays the foundation for future cognitive, emotional, and social development. Maternal stress, on the other hand, can have negative consequences for both the mother and the infant, including impaired bonding, reduced breastfeeding rates, and increased risk of postpartum depression. Growth parameters, such as weight gain and head circumference, are also essential indicators of neonatal health and development.

This systematic review aims to synthesize the existing evidence on the effects of KMC on maternal-infant attachment, maternal stress, and growth parameters in LBW neonates. By examining the available literature, this review seeks to provide a comprehensive understanding of the benefits and limitations of KMC and inform evidence-based practice guidelines for healthcare providers caring for LBW infants and their mothers.

Kangaroo Mother Care (KMC) has gained significant attention globally, with the World Health Organisation (WHO) defining it as a powerful method to promote health and well-being in preterm and full-term infants. KMC involves early, continuous, and prolonged skin-to-skin contact, exclusive breastfeeding, and early hospital discharge. Developed in Bogotá in the 1970s, KMC was recognized by WHO in 2003 as the most effective way to maintain body temperature, stimulate senses, and provide maternal love. In low-income settings, continuous KMC (24 hours/day) is applied, while in more affluent settings, intermittent KMC (limited sessions) is used, particularly in NICUs. Stress in preterm infants can have long-lasting effects on brain organisation and neuroendocrine responses, with epigenetic changes reported in those exposed to high stress levels. KMC can influence stress and attachment in mothers of preterm infants, enhancing infant-mother interaction, bonding, and attachment essential for emotional and social development. However, the optimal duration of KMC to optimize its

DOI Link :: https://doi-ds.org/doilink/10.2024-52741434/UIJIR

© UIJIR | ISSN (O) – 2582-6417
OCT 2024 | Vol. 5 Issue 5
www.uijir.com

benefits and breastfeeding outcomes remains undetermined.

IMPACT OF KANGAROO CARE ON THE MOTHER-INFANT BOND

Maternal-infant attachment is a critical outcome of Kangaroo Mother Care (KMC). Studies have consistently shown that KMC improves maternal-infant attachment, as measured by standardized tools such as the Mother-Infant Bonding Scale (MIBS) and the Maternal Attachment Inventory (MAI). KMC promotes skin-to-skin contact, breastfeeding, and maternal-infant interaction, which are essential for developing a strong maternal-infant bond. A systematic review of 15 studies found that KMC significantly improved maternal-infant attachment compared to traditional care. Furthermore, KMC has been shown to enhance maternal responsiveness, sensitivity, and emotional connection with their infants, leading to a more secure attachment relationship. The improved maternal-infant attachment resulting from KMC has long-term benefits for infant development, social-emotional growth, and mental health outcomes. Kangaroo Mother Care (KMC) is a powerful and nurturing approach to caring for premature and low-birth-weight infants. This innovative method involves placing the baby on the mother's chest, with their bare skin touching, to promote warmth, comfort, and bonding. By doing so, KMC replicates the womb environment, providing the baby with the same warmth, sound, and scent they experienced before birth. This skin-to-skin contact has a profound impact on the baby's development, regulating their heart rate, breathing, and body temperature, while also stimulating digestion and promoting weight gain. Furthermore, KMC fosters a deep sense of connection and attachment between mother and baby, encouraging exclusive breastfeeding and setting the stage for a lifelong bond. By embracing KMC, healthcare providers can empower mothers to take an active role in their baby's care, leading to improved health outcomes, reduced stress, and a more positive parenting experience.

EXPLORING THE IMPACT OF KMC ON MATERNAL ANXIETY AND DEPRESSION.

Maternal stress is a significant concern for mothers of premature or low-birth-weight infants, who often experience anxiety, worry, and fear for their baby's health and well-being. Kangaroo Mother Care (KMC) has been shown to reduce maternal stress levels by promoting a sense of control, empowerment, and confidence in mothers. The skin-to-skin contact and closeness of KMC help to reduce stress hormones, such as cortisol, and increase oxytocin, the "love hormone," which promotes feelings of relaxation and bonding. Studies have consistently found that mothers who practice KMC report lower levels of stress, anxiety, and depression compared to those who do not. By reducing maternal stress, KMC can have a positive impact on both maternal and infant outcomes, including improved breastfeeding rates, increased maternal-infant interaction, and enhanced overall wellbeing. Kangaroo

DOI Link :: https://doi-ds.org/doilink/10.2024-52741434/UIJIR

© UIJIR | ISSN (O) – 2582-6417
OCT 2024 | Vol. 5 Issue 5
www.uijir.com

Mother Care (KMC) has been shown to have a profound impact on reducing maternal anxiety and depression, two common complications of childbirth that can have far-reaching consequences for both mothers and infants. By promoting skin-to-skin contact and closeness, KMC fosters a sense of security and attachment, helping to alleviate symptoms of anxiety and depression. Studies have consistently found that mothers who practice KMC exhibit lower levels of cortisol, the primary stress hormone, and higher levels of oxytocin, the "love hormone," which promotes feelings of relaxation and bonding. Furthermore, KMC empowers mothers to take an active role in their baby's care, promoting a sense of control and confidence that can help mitigate anxiety and depression. As a low-cost, low-tech intervention, KMC offers a promising solution for supporting maternal mental health and promoting a positive postpartum experience.

KANGAROO MOTHER CARE AND GROWTH OUTCOMES IN INFANTS:

Kangaroo Mother Care (KMC) has been shown to have a positive impact on growth parameters in infants, particularly those born preterm or with low birth weight. Studies have consistently found that infants receiving KMC exhibit improved weight gain, length, and head circumference compared to those receiving traditional care. The skin-to-skin contact and frequent breastfeeding that are hallmarks of KMC promote a hormonal response that enhances digestion, absorption, and metabolism, leading to improved nutrient uptake and utilization. Additionally, KMC has been shown to reduce the risk of neonatal morbidities, such as hypothermia, hypoglycemia, and respiratory distress, which can negatively impact growth and development. By promoting optimal growth and development, KMC can have a lasting impact on infant health and wellbeing, with benefits extending into childhood and beyond. Kangaroo Mother Care (KMC) has been consistently shown to positively impact growth outcomes in infants, particularly those born preterm or with low birth weight. By providing a warm, secure, and nurturing environment, KMC promotes optimal growth and development through enhanced breastfeeding, improved thermoregulation, and increased maternal-infant interaction. Studies have demonstrated that infants receiving KMC exhibit improved weight gain, length, and head circumference compared to those receiving traditional care. Additionally, KMC has been found to reduce the risk of growth restriction, neonatal morbidities, and infant mortality. The skin-to-skin contact and frequent breastfeeding that are hallmarks of KMC also promote a hormonal response that enhances digestion, absorption, and metabolism, leading to improved nutrient uptake and utilization. Overall, KMC is a simple, cost-effective, and highly effective intervention that can have a lasting impact on infant growth and development, with benefits extending into childhood and beyond.

DOI Link :: https://doi-ds.org/doilink/10.2024-52741434/UIJIR

© UIJIR | ISSN (O) – 2582-6417
OCT 2024 | Vol. 5 Issue 5
www.uijir.com

THE EFFECTS OF KANGAROO MOTHER CARE ON NEURODEVELOPMENTAL OUTCOMES

The effects of Kangaroo Mother Care (KMC) on neurodevelopmental outcomes have been extensively studied, revealing a profound impact on infant brain development. KMC has been shown to enhance cognitive, motor, and language skills, leading to improved neurodevelopmental outcomes. The skin-to-skin contact and maternal-infant interaction inherent to KMC stimulate the release of neurotransmitters, promoting neural growth and maturation. Studies have demonstrated that infants receiving KMC exhibit improved brain wave activity, increased grey matter volume, and enhanced myelination. Additionally, KMC has been found to reduce the risk of neurodevelopmental delays, attention deficits, and behavioural problems. The benefits of KMC on neurodevelopmental outcomes are thought to be mediated by the reduction of stress, promotion of sleep, and enhancement of maternal-infant bonding. Overall, KMC is a simple, yet powerful intervention that can have a lasting impact on infant brain development and future cognitive, emotional, and social functioning.

EFFECTS OF KANGAROO MOTHER CARE ON BREASTFEEDING EXCLUSIVITY AND FREQUENCY

Kangaroo Mother Care (KMC) has been shown to have a profoundly positive impact on breastfeeding outcomes, particularly in terms of exclusivity and frequency. Studies have consistently demonstrated that mothers who practice KMC are more likely to initiate breastfeeding, achieve exclusivity, and sustain frequent feedings. The skin-to-skin contact and close proximity inherent to KMC stimulate the release of hormones that enhance milk production, letdown, and ejection. Additionally, KMC promotes a sense of security and comfort, reducing stress and anxiety that can inhibit lactation. As a result, infants receiving KMC exhibit improved breastfeeding behaviours, including increased frequency and duration of feedings. Furthermore, KMC has been found to reduce the risk of supplemental feeding, nipple confusion, and breastfeeding cessation. Overall, KMC is a simple, effective, and empowering intervention that supports optimal breastfeeding outcomes, benefiting both mothers and infants.

BARRIERS AND FACILITATORS TO IMPLEMENTING KANGAROO MOTHER CARE

Implementing Kangaroo Mother Care (KMC) can be influenced by various barriers and facilitators. Barriers include lack of knowledge and skills among healthcare providers, inadequate facilities and resources, and cultural and social beliefs that hinder skin-to-skin contact and breastfeeding. Additionally, concerns about infant safety, discomfort, and privacy can also hinder KMC adoption. On the other hand, facilitators of KMC include strong institutional support, trained healthcare staff, and a supportive environment that encourages skin-to-skin contact and breastfeeding. Furthermore, educating

DOI Link :: https://doi-ds.org/doilink/10.2024-52741434/UIJIR

© UIJIR | ISSN (O) – 2582-6417
OCT 2024 | Vol. 5 Issue 5
www.uijir.com

mothers and families about the benefits of KMC, providing emotional support, and addressing cultural and social barriers can also facilitate its implementation. Addressing these barriers and leveraging facilitators is crucial to promoting widespread adoption of KMC, ultimately improving maternal and infant health outcomes. By understanding these factors, healthcare providers and policymakers can develop targeted strategies to overcome obstacles and promote a culture of KMC.

THE BENEFITS OF KANGAROO MOTHER CARE FOR LOW BIRTH WEIGHT INFANTS

Kangaroo Mother Care (KMC) has been shown to have numerous benefits for low birth weight (LBW) infants. By providing a warm, secure, and nurturing environment, KMC helps stabilize the infant's body temperature, heart rate, and breathing, reducing the risk of hypothermia, apnea, and bradycardia. KMC also promotes exclusive breastfeeding, which is crucial for LBW infants, as it enhances nutrient uptake, supports growth and development, and boosts immunity. Additionally, KMC has been found to reduce the risk of neonatal morbidities, such as respiratory distress, necrotizing enterocolitis, and sepsis, and lowers the likelihood of hospital readmission. Furthermore, KMC supports brain development, improves cognitive and motor skills, and enhances parent-infant bonding, leading to better long-term outcomes for LBW infants. Overall, KMC is a simple, effective, and cost-efficient intervention that can significantly improve the health and well-being of LBW infants.

COMPARING KANGAROO MOTHER CARE TO OTHER INTERVENTIONS

Comparing Kangaroo Mother Care (KMC) to other interventions reveals its unique benefits and advantages. Unlike traditional incubator care, KMC provides a more natural and nurturing environment, promoting better thermoregulation, breastfeeding, and maternal-infant bonding. In contrast to skin-to-skin contact alone, KMC offers a more comprehensive and prolonged approach, leading to improved outcomes. When compared to other breastfeeding support interventions, KMC demonstrates superior effectiveness in increasing breastfeeding rates, duration, and exclusivity. Additionally, KMC has been shown to be more effective than other maternal-infant bonding interventions in reducing stress, anxiety, and depression in mothers. Overall, KMC stands out as a simple, cost-effective, and highly effective intervention that can be implemented in various settings, making it an attractive option for healthcare providers and policymakers seeking to improve maternal and infant health outcomes.

CONCLUSION

In conclusion, Kangaroo Mother Care (KMC) is a powerful and transformative intervention that has revolutionized the care of new-borns, particularly low birth weight and preterm infants. By harnessing the natural bond between mother and baby, KMC has been shown to improve outcomes, reduce

DOI Link :: https://doi-ds.org/doilink/10.2024-52741434/UIJIR

morbidities and mortalities, and promote optimal growth and development. Its benefits extend beyond the neonatal period, influencing long-term cognitive, emotional, and social development. As a low-cost, low-tech, and highly effective intervention, KMC has the potential to transform healthcare systems, empowering mothers and families to take an active role in their care. As research continues to uncover the full extent of KMC's benefits, it is clear that this simple yet profound intervention has the power to change the trajectory of infant care, one embrace at a time.

REFERANCE

1. Boundy EO, Dastjerdi R, Spiegelman D, Fawzi WW, Missmer SA, Lieberman E, Kajeepeta S, Wall S, Chan GJ. Kangaroo Mother Care and Neonatal Outcomes: A Meta-analysis. Pediatrics. 2016 Jan;137(1):e20152238. doi: 10.1542/peds.2015-2238. Epub 2015 Dec 23. PMID: 26702029; PMCID: PMC4702019.
2. Conde-Agudelo A, Díaz-Rossello JL. Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. Cochrane Database Syst Rev. 2016 Aug 23;2016(8):CD002771. doi: 10.1002/14651858.CD002771.pub4. PMID: 27552521; PMCID: PMC6464509.
3. Sinha B, Sommerfelt H, Ashorn P, Mazumder S, Taneja S, More D, Bahl R, Bhandari N. Effect of Community-Initiated Kangaroo Mother Care on Postpartum Depressive Symptoms and Stress Among Mothers of Low-Birth-Weight Infants: A Randomized Clinical Trial. JAMA Netw Open. 2021 Apr 1;4(4):e216040. doi: 10.1001/jamanetworkopen.2021.6040. PMID: 33885776; PMCID: PMC8063066.
4. Gupta M, Jora R, Bhatia R. Kangaroo Mother Care (KMC) in LBW infants--a western Rajasthan experience. Indian J Pediatr. 2007 Aug;74(8):747-9. doi: 10.1007/s12098-007-0131-x. PMID: 17785897.
5. WHO Immediate KMC Study Group. Impact of continuous Kangaroo Mother Care initiated immediately after birth (iKMC) on survival of newborns with birth weight between 1.0 to < 1.8 kg: study protocol for a randomized controlled trial. Trials. 2020 Mar 19;21(1):280. doi: 10.1186/s13063-020-4101-1. PMID: 32188485; PMCID: PMC7081677.
6. Care of Preterm or Low Birthweight Infants Group. New World Health Organization recommendations for care of preterm or low birth weight infants: health policy. EClinicalMedicine. 2023 Aug 16;63:102155. doi: 10.1016/j.eclinm.2023.102155. PMID: 37753445; PMCID: PMC10518507.
7. Azad M, Bisht SS, Tyagi A, Jaipal ML. The role of a neonatal hypothermia alert device in promoting weight gain in LBW infants. J Matern Fetal Neonatal Med. 2022 Aug;35(15):2992-2994. doi: 10.1080/14767058.2020.1814244. Epub 2020 Sep 22. PMID: 32962461.
8. Song JT, Kinshella MW, Kawaza K, Goldfarb DM. Neonatal Intensive Care Unit Interventions to Improve Breastfeeding Rates at Discharge Among Preterm and Low Birth Weight Infants: A Systematic

DOI Link :: https://doi-ds.org/doilink/10.2024-52741434/UIJIR

Review and Meta-Analysis. Breastfeed Med. 2023 Feb;18(2):97-106. doi: 10.1089/bfm.2022.0151. Epub 2023 Jan 2. PMID: 36595356.

9. Koreti M, Muntode Gharde P. A Narrative Review of Kangaroo Mother Care (KMC) and Its Effects on and Benefits for Low Birth Weight (LBW) Babies. Cureus. 2022 Nov 27;14(11):e31948. doi: 10.7759/cureus.31948. PMID: 36582577; PMCID: PMC9794926.
10. Amelia T, Pratomo H, Adisasmita AC, Martha E, Rustina Y, Murty AI, Susilowati IH, Tambunan ES, Hasanah IJ. Feasibility of Kangaroo Mother Care (KMC) Implementation in Depok City, Indonesia. Glob Pediatr Health. 2021 Apr 27;8:2333794X211012390. doi: 10.1177/2333794X211012390. PMID: 33997123; PMCID: PMC8107929.
11. Nagai S, Yonemoto N, Rabesandratana N, Andrianarimanana D, Nakayama T, Mori R. Long-term effects of earlier initiated continuous Kangaroo Mother Care (KMC) for low-birth-weight (LBW) infants in Madagascar. Acta Paediatr. 2011 Dec;100(12):e241-7. doi: 10.1111/j.1651-2227.2011.02372.x. Epub 2011 Jun 23. PMID: 21635363.
12. Zhu Z, Wang X, Chen W, Pei S, Wang Q, Guan H, Zhu G. The efficacy of Kangaroo-Mother care to the clinical outcomes of LBW and premature infants in the first 28 days: A meta-analysis of randomized clinical trials. Front Pediatr. 2023 Feb 27;11:1067183. doi: 10.3389/fped.2023.1067183. PMID: 36923278; PMCID: PMC10008937.
13. Bilal SM, Tadele H, Abebo TA, Tadesse BT, Muleta M, W/Gebriel F, Alemayehu A, Haji Y, Kassa DH, Astatkie A, Asefa A, Teshome M, Kawza A, Wangoro S, Brune T, Singhal N, Worku B, Aziz K. Barriers for kangaroo mother care (KMC) acceptance, and practices in southern Ethiopia: a model for scaling up uptake and adherence using qualitative study. BMC Pregnancy Childbirth. 2021 Jan 7;21(1):25. doi: 10.1186/s12884-020-03409-6. PMID: 33413193; PMCID: PMC7789316.
14. Kurniawati, Rustina Y, Budiati T. Peer Support Increases Maternal Confidence, Kangaroo Mother Care Implementation and Weight Gain in LBW Infants. Compr Child Adolesc Nurs. 2019;42(sup1):252-260. doi: 10.1080/24694193.2019.1594457. PMID: 31192719.
15. Care of Preterm or Low Birthweight Infants Group. Research priorities for care of preterm or low birth weight infants: health policy. EClinicalMedicine. 2023 Aug 16;63:102126. doi: 10.1016/j.eclinm.2023.102126. PMID: 37753444; PMCID: PMC10518498.
16. Joshi A, Londhe A, Joshi T, Deshmukh L. Quality improvement in Kangaroo Mother Care: learning from a teaching hospital. BMJ Open Qual. 2022 May;11(Suppl 1):e001459. doi: 10.1136/bmjoq-2021-001459. PMID: 35545277; PMCID: PMC9092177.
17. Dhage VD, Rannaware A, Choudhari SG. Kangaroo Mother Care for Low-Birth-Weight Babies in Low and Middle-Income Countries: A Narrative Review. Cureus. 2023 Apr 30;15(4):e38355. doi: 10.7759/cureus.38355. PMID: 37274008; PMCID: PMC10232296.

DOI Link :: https://doi-ds.org/doilink/10.2024-52741434/UIJIR

18. Conde-Agudelo A, Belizán JM, Diaz-Rossello J. Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. Cochrane Database Syst Rev. 2011 Mar 16;(3):CD002771. doi: 10.1002/14651858.CD002771.pub2. Update in: Cochrane Database Syst Rev. 2014 Apr 22;(4):CD002771. doi: 10.1002/14651858.CD002771.pub3. PMID: 21412879.
19. Conde-Agudelo A, Díaz-Rossello JL. Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. Cochrane Database Syst Rev. 2014 Apr 22;(4):CD002771. doi: 10.1002/14651858.CD002771.pub3. Update in: Cochrane Database Syst Rev. 2016 Aug 23;(8):CD002771. doi: 10.1002/14651858.CD002771.pub4. PMID: 24752403.
20. Debere MK, Haile Mariam D, Ali A, Mekasha A, Chan GJ. Survival status and predictors of mortality among low-birthweight neonates admitted to KMC units of five public hospitals in Ethiopia: Frailty survival regression model. PLoS One. 2022 Nov 10;17(11):e0276291. doi: 10.1371/journal.pone.0276291. PMID: 36355701; PMCID: PMC9648734.
21. Anwar F, Warsi A, Ahmed J, Zaidi B, Turab A, Khan MA, Khan KS. The effectiveness of kangaroo mother care in lowering postpartum depression in mothers of preterm and low birth weight babies: a systematic review and meta-analysis. Ann Med Surg (Lond). 2023 Apr 12;85(6):2841-2848. doi: 10.1097/MS9.0000000000000480. PMID: 37941566; PMCID: PMC10631594.
22. Daga S. Reinforcing kangaroo mother care uptake in resource limited settings. Matern Health Neonatol Perinatol. 2018 Dec 4;4:26. doi: 10.1186/s40748-018-0091-3. PMID: 30534411; PMCID: PMC6278098.
23. Conde-Agudelo A, Diaz-Rossello JL, Belizan JM. Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. Cochrane Database Syst Rev. 2003;(2):CD002771. doi: 10.1002/14651858.CD002771. Update in: Cochrane Database Syst Rev. 2011 Mar 16;(3):CD002771. doi: 10.1002/14651858.CD002771.pub2. PMID: 12804436.
24. Prasad T, Roy AK. Postnatal Kangaroo mother care practice at home and comparison of improvement in vital parameters in low-birth-weight babies in-home setup and non-teaching hospital setup in rural coal mines area Jharkhand, India: A community-based observational study. J Family Med Prim Care. 2023 Sep;12(9):2103-2109. doi: 10.4103/jfmpc.jfmpc_407_23. Epub 2023 Sep 30. PMID: 38024894; PMCID: PMC10657050.
25. Rahmatika QT, Aditya RS, Yusuf A, Almutairi RL, Al Razeeni DM, Kotijah S, Sulistyorini A. We are facing some barriers: A qualitative study on the implementation of kangaroo mother care from the perspectives of healthcare providers. J Public Health Afr. 2022 Dec 7;13(Suppl 2):2412. doi: 10.4081/jphia.2022.2412. PMID: 37497131; PMCID: PMC10367030.
26. Conde-Agudelo A, Diaz-Rossello JL, Belizan JM. Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. Cochrane Database Syst Rev. 2000;(4):CD002771. doi:

DOI Link :: https://doi-ds.org/doilink/10.2024-52741434/UIJIR

10.1002/14651858.CD002771. Update in: Cochrane Database Syst Rev. 2003;(2):CD002771. doi: 10.1002/14651858.CD002771. PMID: 11034759.

27. Guo W. Evaluation of the impact of kangaroo mother care on neonatal mortality and hospitalization: A meta-analysis. Adv Clin Exp Med. 2023 Feb;32(2):175-183. doi: 10.17219/acem/153417. PMID: 36251794.
28. Patawat M, Choudhary R, Jain MK, Chanchalani R, Jain A. Improving the Duration and Rate of Home-Based Kangaroo Mother Care: A Before-and-After Intervention Study. Cureus. 2023 Apr 20;15(4):e37861. doi: 10.7759/cureus.37861. PMID: 37223204; PMCID: PMC10204614.
29. Ariff S, Maznani I, Bhura M, Memon Z, Arshad T, Samejo TA, Zaidi S, Umer M, Ahmed I, Habib MA, Soofi SB, Bhutta ZA. Understanding Perceptions and Practices for Designing an Appropriate Community-Based Kangaroo Mother Care Implementation Package: Qualitative Exploratory Study. JMIR Form Res. 2022 Jan 7;6(1):e30663. doi: 10.2196/30663. PMID: 34994692; PMCID: PMC8783273.
30. Mathias CT, Mianda S, Ginindza TG. Evidence of the factors that influence the utilisation of Kangaroo Mother Care by parents with low-birth-weight infants in low- and middle-income countries (LMICs): a scoping review protocol. Syst Rev. 2018 Apr 5;7(1):55. doi: 10.1186/s13643-018-0714-9. PMID: 29622026; PMCID: PMC5887207.

DOI Link :: https://doi-ds.org/doilink/10.2024-52741434/UIJIR