



# **A Narrative Review On Effectiveness Of Kangaroo Mother Care-Training Programme (KMC-TP) Among Postnatal Mothers With Their Infant Wellbeing.**

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## **ABSTRACT**

Kangaroo mother care (KMC) is a technique that involves skin to skin contact between a newborn infant and a care giver.. This review standpoints the effect of KMC on post natal mothers to gain knowledge and practice, weight gain of LBW neonates,. KMC-TP also improves breastfeeding rates and reduces mortality rates during the hospital stay as well as at home. KMC-TP can be provided not only by mothers but also by fathers, Grandparents and other adults in the family. However, it is not routinely practiced in hospitals. Short-term and long-term KMC-TP is beneficial for life survival, growth and development, neurobehavioral development, organ development, breastfeeding, and mother-infant bonding. When the babies were delivered before completion of 37 wks of gestation those babies are more likely to experience neonatal mortality and morbidity due to acute breathing problems, gastrointestinal problems, autoimmune disorders, and neurological defects as compared to full-term and normal-weight gain infants. A thorough literature search was conducted using key databases like PubMed and Google Scholar, as well as web of sciences and Medical Subject nursing Heading (MeSH) terms and related keywords. Clinical health experts also believed that implementing with good practices of KMC-TP would assist mothers in developing their emotional bonds with their baby. As a result, KMC managed babies had better weight gain ,earlier hospital discharge and more impressively, empowers parents : good bonding , increased confidence , and deep satisfaction due to active involvement in KMC-TP and also improves health outcome by providing early Breast feeding, temperature regulation and Strong bonding. It is crucial to remember that KMC-TP works better for babies with very low birth weight (VLBW), preterm babies, infant wellbeing and develop

good bonding among mothers with their infants. The mother-child relationship enhances growth parameters like physical, behavioral and psychosocial parameters.

## Introduction & Background

Baby must survive and thrive survival needs immediate skin to skin contact and then zero separation. Birth weight is the first weight of the newborn obtained after birth. For live births, birth weight should preferably be measured within the first hours of life, before significant post natal weight loss has occurred. The WHO defines low birth weight (LBW) as less than 2,500 gm (up to and including 2,499 grams) at birth, very low birth weight (VLBW) babies are those who weigh less than 1,500 gm, and extremely low birth weight (ELBW) babies weigh 1,000 gm. A new approach called kangaroo mother care-training programme (KMC-TP) was initiated to provide care to LBW babies. It promotes optimal heat management, breastfeeding, infection prevention, and bonding, all of which benefit their health and well-being. In KMC-TP, premature infants are kept skin-to-skin contact with their mothers. It is a straightforward and efficient method for enhancing the health and development of both early and full-term infants.

## History of KMC:

A Team of pediatrician started KMC in institute materno infantile (IMI) in Bogota, Colombia in 1978. In 2003, WHO formally endorsed KMC and published KMC practice guidelines. KMC was introduced in India, in 1994 in BJ Medical college hospital, Ahmedabad. This was followed by experiences in KEM Mumbai and at the all India institute medical sciences (AIIMS). A KMC India Network ([www.kmcindia.org](http://www.kmcindia.org)) comprising six institutions was started in 2003.

It primarily devised strategic means to compensate scarcity of facilities for treating LBW babies. KMC-TP shortens hospital stays and lowers rates of hypothermia and neonatal infections. KMC can be provided in settings with limited resources because it does not require technology or electricity. LBW results from premature birth and constrained intrauterine growth. It is linked to escalating fetal or neonatal mortality rates, slowed growth or cognitive development, and later-life chronic diseases. One of the major goals of "A World Fit for Children" is to reduce LBW in 2020 was to reduce the number of LBW Newborns by 30% compared to 2012. KMC-TP is adopted worldwide by placing the newborn against the mother's chest to promote good bonding and breast feeding.

**According to UNICEF data:**

In 2020, 19.8 million newborns an estimated 14.7% of all babies born globally that year, suffered from low birth weight. These babies were more likely to die during their first month of life and those who survived face lifelong consequences including a higher risk of stunted growth, low IQ, and adult onset chronic conditions such as obesity and diabetes. To grow a healthy baby, mothers need good nutrition and rest, adequate antenatal care, and a clean environment. Together these ingredients for a healthy pregnancy can help to prevent, identify, and treat the conditions that cause LBW and thus foster achievement of the World Health Assembly (WHA) nutrition target to reduce low birth weight by 30 percent between 2012 to 2030.

Clinical health experts also believed that implementing KMC-TP would increase mothers' emotional bonds with their infants. As a result, both mothers and their infants were calmer and newborns felt safer. KMC was also observed to promote the infants' development and growth, which resulted in the mother feeling a stronger sense of connection. KMC-TP does not require equipment use. The KMC technique helps in providing care to premature infants and delivers increased protection to the baby [\[1\]](#).

**KMC-POSITION:**

The kangaroo position along with the kangaroo feeding strategy and the early discharge policy, is one of the components of the KMC. It should be proposed to all preterm and newborn babies (less than 37 weeks of gestational age) weighing less than 2500g at birth. This document was coauthored by doctors J.G Ruiz and N. Charpak and published by the Kangaroo Foundation in 2007 School of Medicine of the University Javeriana -Bogota. The baby position on his mother has been described as "frog-like". The child is under the clothes covering the mother's thorax, protecting his head and back and avoiding heat loss through radiation. The child usually wears a cap preventing heat loss through the head as well as a diaper, socks and shirt covering his back but allowing direct and large contact between the child's skin and his mother's chest skin. A cloth support or girdle (cotton or elastic material) is used to this position. The cloth support helps to prevent the child's airway from being obstructed by changes in position. This is particularly important as a preterm infant are usually hypotonic. Without this support, obstructive positional apneas may occur.



In the long run, more than two out of every three premature babies will have no developmental issues. In contrast, most others will have only minor to moderate disabilities or delays. This photosynthetic therapy will help preventing complication due to physiological jaundice. More intensive therapies like blood exchange transfusions or intravenous antibody injections may be necessary if phototherapy therapy is not successful, but these are rare. Common health problems in children include LBW, respiratory, gastrointestinal, malnutrition, childhood infection, disability, and deformity. The scope of the issue and the best care for LBW/preterm infants should be discussed and incorporated into ongoing community activities. Fathers or family members who have successfully cared for LBW/preterm infants using KMC-TP. In order to fulfil their developmental support, full-term infants and premature infants are given KMC for six months and three months, respectively. The infant is wrapped in cloth, and the adult and newborn are in skin-to-skin contact on the chest. Baby wearing is a common practice that can be done with various carriers and slings. The child may be in front of or behind the adult, and they are both fully dressed.

Only a Less percentage of infants can receive medical attention in hospitals in most developing nations. In these environments, some births still occur at home, and newborns delivered in facilities are often released before their EDD. Therefore, it is essential to assess KMC in a thorough and efficient manner. Although these complications are not identified until late in the hospitalization, it has been discovered that providing parents with a comprehensive view of the hospitalization is beneficial. LBW babies have difficulties within the first 24 hours of birth. All newborns who weigh less than 2,500 gm are qualified for KMC. There are more than 20 million babies worldwide, or 15.5% of all births, who have LBWs. According to WHO, the annually incidence of 33% of babies born in India are underweight. The leading and second-leading causes of newborn deaths worldwide are both prematurity.

## KMC-TP duration:

According to Indian scientists, KMC-TP is the term used to describe the care given by a newly delivered mother to her LBW newborn baby by placing the baby between her breasts. Provide position for 6 to 8times in every 24 hours, Sessions that last less than an hour should be avoided because the baby might get stressed out from the constant handling. Skin-to-skin contact should instead increase and continue throughout the day. There must be at least six to eight hours of practice .

KMC-TP provides infants tactile stimulation by facilitating early skin-to-skin contact between mother and infant. In addition, it stimulates their Senses like kinetic, olfactory, and afferent sensory systems through breastfeeding and nipple sucking. In addition KMC –TP , it improves bonding, attachment, and interaction between mother and child, which is essential for the social and emotional development of the child. This review article aims to investigate the effects of KMC-TP on newborns . To determine the therapeutic effect of maternal care on LBW infants .

### Review

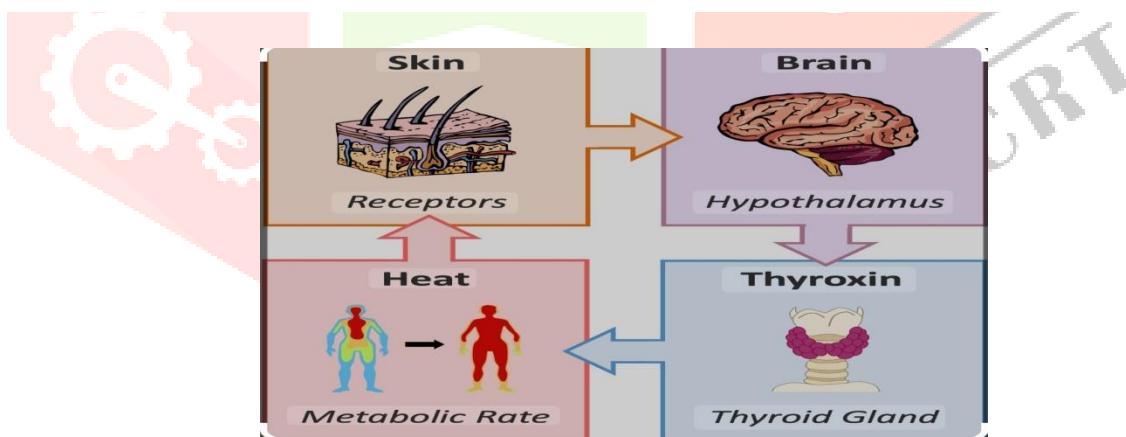
An online search was conducted using PubMed, Google Scholar, and Web of Science to find scholarly articles. Key Medical Subject Heading (MeSH) search terms such as "Kangaroo mother care benefits," "Low birth weight baby," "neonatal child," "preterm child," and "infant child development" were used. They were used interchangeably and in combination to find all relevant articles. The literature search used the boolean terms AND, OR, and BUT for more clear results. 45 articles were retrieved and 36 out of those were utilized for this review based on the articles' relevance. Many of articles were explainind about all benefits ok KMC it includes in **Thermoregulation**: it regulate the body temperature and provide the neutral environment; Research results show that when a stable preterm infant is placed in skin to skin contact his body temperature raises. **Heart rate**:in this aspect heart rate of a child placed in KMC position ,is more or less similar compared to the heart rate of the child in an incubator and some times it can increases by 5 to 10 beats per minute .some of descriptive studies as well as pre test and post test reports have shown evidence of low incidence of bradycardia in KMC Position. **Respiratory rate**: with this regard in stable preterm and LBW infants oxygen saturation and respiratory rate are similar to those observed in incubators regulate breathing and prevent the apnea. A Cochrane meta analysis confirmed that the respiratory rate of LBW babys in KMC is lower within normal range than in incubator. **Oxygen saturation**: in this aspect oxygen saturation may increases between 2-3% in KMC position as compared to saturation in incubator even during painful procedures.one meta-analysis conducted in japan on the duration of KMC position ,shows that oxygen saturation may decreases up to 0.6%.the evidence help to confirm they oxygen saturation is variable but remains within acceptable clinical standards. **Apnea**: with this regard there is no direct evidence that the KMC position prevents the incidence or severity of episodes of apnea of

prematurity. In research evidences has demonstrated that infants in KP do not have an increased risk of apnea. KP-Diminishing pain and stress: cortisol release has been evaluated as sign of physiological stress in low birth babys. Most measurements done after 20 mts in KMC have shown a reduction up to 60% cortisol level as compared to child in incubator. The American Academy of Pediatrics in 2006 recommended using the KMC in order to reduce the intensity and duration of the reaction triggered by mildly to moderately painful procedures. **Early breast feeding:** one of the advantages of continuous mother –infant contact is to stimulate breast feeding. More recent studies have found a significant prolongation of breast feeding in KMC mothers to 6 months. KMC method seems to foster early neurologic development in infants ,showing an improvement in behavioral organization in the sleep wake cycle. All articles with free and full text availability through PubMed were included in this review. The articles ranging from 2000 to 2022 were used, highlighting the essence of breastfeeding and why it is important. The emphasis of this review is on the importance of KMC –TP for newborns, LBW, Pre term babys and develop efficient bond between mother and baby . Case reports were not evaluated in the review.

## BIOOGICAL CAHNGS IN SYSTEMS:

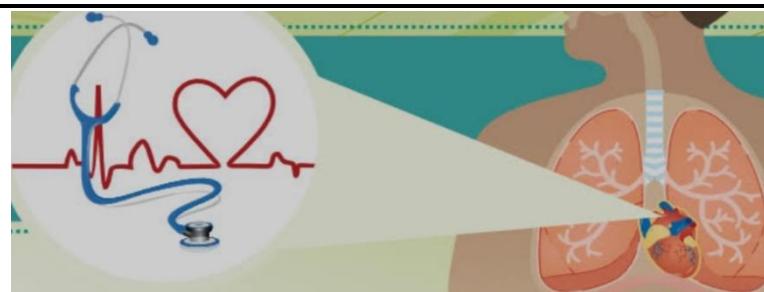
### KMC AND Biology in Skin :

It is a unique mechanism for skin to skin contact between the mother and the baby right after birth. by providing this position it can help to regulate body heat and temperature.



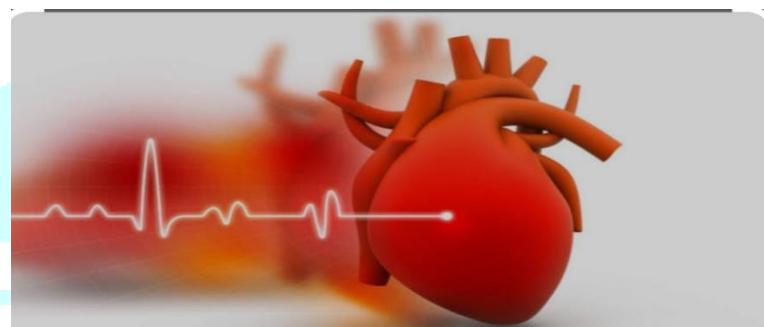
### KMC AND Respiratory system :

KMC is a method of holding a baby close to the mothers chest for prolonged skin to skin contact.it can help regulate baby's respiratory rate.

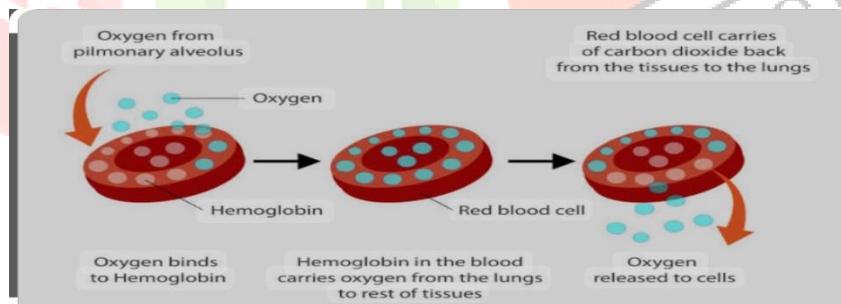


### KMC AND Cardiac system :

KMC can help regulate an infants heart rate and improve other vital signs. in heart rate: KMC can decreases an infants heart rate. Preterm infants with low baseline heart rate variability may be benefit the most from KMC, and may seen an increase in HRV.



**KMC AND blood :** In KMC the placement of an infant in prone position and skin to skin contact on the mothers chest, has been shown to have exchanging process of blood and also many benefits to the mother include reduce anxiety while taking respiration.



Extra research is necessary to confirm the effects of KMC-TP on infant development and physiologic stability. Infants from the KMC-TP had larger heads, were heavier, and performed better in neurobehavioral and psychological development. Infants who are clinically stable, preterm, or extremely preterm can maintain a stable body temperature, heart rate (HR), respiratory rate (RR), and oxygen saturation rate (O<sub>2</sub> sat). Infants maintain stable body temperature during KMC in the early postpartum period. KMC lengthens sleep, including periods of quiet rest. Most clinical providers learned about KMC through personal observation or experience with KMC's practice. Many people had no formal training they lacked confidence in treating LBW with KMC, which also had to do with newborn safety.

## KMC as a Gold Standard of Care for All Infants

It is strongly suggested that KMC-TP become the gold standard of care for providing high-quality healthcare to all infants, regardless of location or socioeconomic status, as a practical, natural, and affordable intervention. And also it must be free of the following conditions: apnea, irregular heart rate, Contagious rash or skin lesions, fever, Non controlled epilepsy(sudden electrical discharges of neurotransmitters) ,Not controlled mental illness ,morbidity obesity ,tired mothers or mothers under sedative drugs or in the recovery process from general anesthesia.

### Don'ts of KMC :

Do not bathe till infant weight 2,500 g sponging may be done, do not handle infant too frequently, do not give bottle feed, do not allow infant to be in contact with sick people.

### Limitations

A disadvantage of intermittent KMC is that it involves less frequent breastfeeding than needed. KMC must be maintained daily. It is acceptable to lessen skin-to-skin contact and increase the frequency of breastfeeding if the infants refuse to be put in the kangaroo position as they become older. Fathers or other family members can alternately provide skin-to-skin contact to give mothers a break.

### Conclusions

The review suggests that KMC Improves good functioning of heart, lungs ,exchanges of blood through circulation, growth velocity, may also reduce morbidity and hospital stays in underdeveloped areas. And also, it is an simple ,acceptable ,affordable ,feasible to mother in hospital as well as at home after discharge . KMC-TP is very effective and low-cost technique that protects newborns from hypothermia and promotes child growth. KMC boosts the mother's confidence in caring for her preterm infant.

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