Kangaroo Care and Its Benefits on Premature Infants: A Literature Review

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Abstract

Background: Premature infant morbidity and mortality rates have consistently been a high concern for those in the medical field in regards to the cost of care, effectiveness of care, and various other factors in regards to infant health. **Purpose:** This paper is a compilation of worldwide-original research articles studying the topic of Kangaroo Mother Care (KMC) and its effects on the morbidity and mortality in premature infants within the first three months of life. **Search Method:** Using the EBSCOHost database search engine, scholarly, peer-reviewed articles on the topic of KMC and the morbidity/mortality of premature infants from 2016 to 2021 were allocated and reviewed. Nine references were collected and utilized to present the effects of KMC on premature infants and its implementation in the medical field. **Results:** The literature showed that the implementation of KMC in premature infants is a cost-effective method that yields outcomes that are better than those cared for in conventional methods of care, including decreased morbidity and mortality rates. **Nursing Implications:** Nurses should recommend the utilization of KMC in premature infants to lower costs and improve patient outcomes in regards to premature infants and parents, especially with the creation of equipment such as a customized baby wrap. **Conclusion:** Based on the literature reviewed, KMC proves to be a cost-effective care strategy on premature infants that yields lower morbidity/mortality rates and better outcomes for both the baby and mother when compared to the conventional mother care procedures.

Keywords: Kangaroo Mother Care (KMC), skin-to-skin contact, premature infants, low birth weight infants, infant morbidity and mortality, effectiveness of kangaroo care, preterm Infants, very low birth weight infants, outcomes of Kangaroo Mother Care

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General Information

Prematurity and preterm birth have been topics many in the medical field have grappled with, especially in the neonatal intensive care unit (NICU). An estimated 27% of the 4-million neonatal deaths every year are caused by preterm birth, making it the leading cause of neonatal deaths (Albishry et al., 2018). Using the proportions and data, that is an average of 2,959 deaths per day. The amount of new technology being implemented in the medical field certainly helps those infants that are not hemodynamically stable and have larger health problems than others, but the question becomes if there is a simpler yet effective technique that can improve outcomes.

Definitions

According to Albishry et al. (2018), "preterm birth applies to delivery prior to a gestational age of 37 weeks" (p. 27). Furthermore, preterm labor is now considered to "be a syndrome initiated by many risk factors and mechanisms, including infection or inflammation, utero placental ischemia or hemorrhage, uterine over distension, stress, and other immunologically mediated processes" (p. 27). Prematurity can cause a number of disabilities that include cerebral palsy, mental retardation, visual and hearing impairments. Subtle central nervous system disorders including developmental coordination disorders or minor neuromotor dysfunction, attention deficit- hyperactivity disorder, learning disabilities, language disorders, behavioral problems and social-emotional difficulties are also noted in premature infants (Albishry et al., 2018). Hospitals are constantly using the newest technology and equipment so as to help care for these infants and give them the best chance at a full healthy life. As wonderful as this may be though, what if the answer lied in a simpler intervention? The World Health

Organization (WHO) has defined Kangaroo Mother Care (KMC) as "early, continuous, and prolonged skin-to-skin contact between a mother and her newborn with father/substitute(s) participating as KC providers; frequent and exclusive breastfeeding; and early discharge from hospital" (El-Farrash et al., 2019, p. 683).

Background Information

Kangaroo Mother Care (KMC) was started in Bogotá, Colombia by Dr. Edgar Rey and Dr. Hector Martinez of the Instituto Materno Infantil in 1978 (Kumbhojkar et al., 2016). This technique was developed as an alternative for insufficient power, equipment, and incubator care for preterm babies who required feeding and growing only. Their development of KMC proved to be pivotal as it decreased the mortality rate of preterm infants from 70% to 30% (Albishry et al., 2018). However, the utilization of KMC has proven to be minimal despite WHO recommendations of its use for well over a decade on an individual and community level (Mazumder et al., 2019). The purpose of this literature review is to investigate the outcomes of premature infant morbidity and mortality when kangaroo care between mother and baby was implemented by nursing staff. This paper will focus on KMC outcomes in regards to premature infant health, neurobehavioral and feeding performance, and stress response.

Search Methods

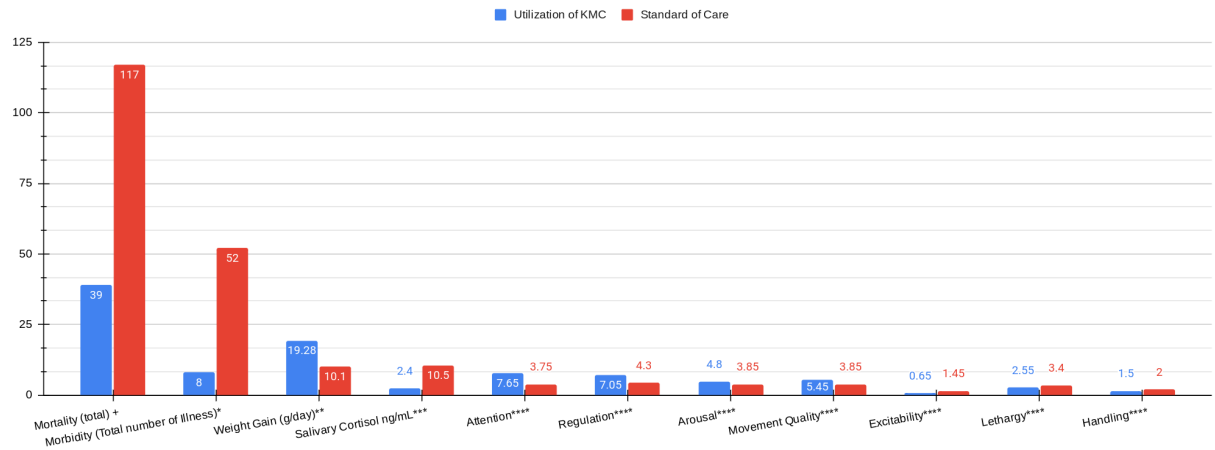
Using the EBSCOHost database search engine, scholarly, peer-reviewed articles on the topic of KMC and the morbidity/mortality of premature infants were allocated and reviewed. The EBSCOHost database search engine was narrowed down to only look in specific databases that included CINAHL Complete, Health Source: Nursing/Academic Edition, and MEDLINE with Full Text. Inclusion criteria included full text articles, articles available to the public, articles

published between the years 2016 and 2021, original research articles, and are published in a PDF format. Nine references that fit the inclusion criteria were collected and utilized to present the effects of KMC on premature infants and its implementation in the medical field. The references consisted of a hospital based prospective observational study, a case control design, three randomized control trials, a quasi-experimental design, prospective randomized controlled study, pilot open-labeled quasi-randomized clinical trial, and a prospective cross-over design.

Findings

Figure 1

Kangaroo Mother Care Benefits Compared to the Standard of Care



Note: + Data from Table 2 in Sari et al. (2016). *Data from Table 2 in Kumbhojkar et al. (2016). Illnesses incorporated were hypothermia, sepsis, and apnea (in <32-week gestation individuals). **Data from Table 2 in Swarkner and Vagha (2016). *** Measurement of stress response in infants of the 120-minute intervention group compared to the control in Table 3 of El-Farrash et al. (2019). **** These categories are from the Neonatal Intensive Care Unit Network

Neurobehavioral Scale (NNNS) and data is from the 120-minute intervention group compared to the control found in Table 3 of El-Farrash et al. (2019).

Premature Infant Health and Kangaroo Care

Throughout the article findings, the overall health of premature neonates has been shown to have positive outcomes that result in lower morbidity and mortality rates. In the duration of one study, the survival rate of the study group was 100%, which was congruent with various other studies (Albishry et al., 2018). KMC on premature infants showed that there were protective effects against morbidities such as hypothermia, apnea, and sepsis (Kumbhojkar et al., 2016). Vital sign data in perspective to the heart rate, oxygen saturation, blood pressure, and temperature showed better outcomes in the KMC group than the conventional care group (Albishry et al., 2018; El-Farrash et al., 2019). The result of these better outcomes showed shorter hospital stays than those with standard of care (Kumbhojkar et al., 2016; Mishra et al., 2017; Rahman et al., 2017; Swarnkar & Vagha, 2016). All data showed better health outcomes and positive prognosis of those involved with KMC during hospital stay and follow-up visits.

Neurobehavioral and Feeding Performance with Kangaroo Care

Feeding performance was greatly increased in those neonates that were initiated in KMC, gaining an average of 120 grams in five days (Albishry et al., 2018). Furthermore, those with KMC showed progress to enteral feedings in a shorter time than the control group (El-Farrash et al., 2019). With the increased feeding, neurobehavioral scores also improved. According to El-Farrash et al. (2019), infants that received KMC showed “increased alertness/attention and reduction in the overall likelihood of a neurodevelopmental delay” (p. 687). There was also a note of infants with KMC being less irritable and having better “arousal, regulation, nonoptimal

reflexes, and quality of movements and lower scores for excitability and lethargy and a lower need for handling compared to those of the control group," which proved to be statistically significant (El-Farrash et al., 2019). This data can help in guidance for nursing staff and parents in reducing stresses of caring for high-need infants.

Stress Response with Kangaroo Care

Stress was analyzed through salivary cortisol levels. Cortisol is a stress hormone secreted by the adrenal glands. In one study where there were two KMC groups and one control group, the salivary levels in the experimental groups were significantly lower than those in the control group (El-Farrash et al., 2019). Furthermore, another study showed that the effects do not seem to change significantly if the father or mother is involved in the contact (Srinath et al., 2016). With that in mind, both parents can easily be directly involved in the child's care. These findings can also apply to parents that are of the same sex, however there is no data or study that can confirm or reject this hypothesis.

Implementation of Kangaroo Care in the Hospital Setting

With the preceding data and findings, KMC is a truly medically-effective and cost-effective intervention for preterm infants. However, implementation needs to be more common and accepted in hospitals globally. As mentioned previously, KMC utilization has been minimal for over a decade despite WHO recommendations (Mazumder et al., 2019). This can be attributed to fear of parents caring for the infant without advanced medical care due to fragility. Another can be related to mother instability postpartum or the father not being available or involved with the child at all. With these in mind, the recommendation of new programs incorporating KMC should be considered. The following are some ideas.

Volunteers to Conduct KMC

In the scenario of maternal instability or lack of father, KMC can prove to be a difficult intervention to put in place. However, with the data saying that male and female contact with KMC can prove to be equally effective, the potential for volunteer programs that can aid in its implementation and promotion of positive prognosis. The need for extensive screening and consents of mothers in situations that are applicable needs to be in place. The need for supervision and training of volunteers is also needed, which can prove to be problematic for staffing and financial implications. However, with the consistent use of KMC, finances can be saved due to reduced cost in running equipment that is not needed for an individual. Candidacy of infants and volunteers should be handled on a case-by-case basis.

Specialized Wraps

Another way that KMC can be implemented while reducing parental stress of caring for the infant is the utilization of customized wraps. In Chavula et al. (2020), a customized wrap specifically used in KMC showed that there was better infant feeding and bonding outcomes between mother and infant. Added to the reported findings in this review, the implementation of a wrap to support extended KMC can help improve infant outcomes at a higher rate. Though financial implications are to be considered, the addition of these wraps to the KMC intervention can prove to be effective in outcomes.

Limitations in Research

There were limitations in the creation of the literature review to consider. First, research only focused on hemodynamically-stable preterm infants, making it difficult to see how it would also benefit higher-fidelity infants. The research also had a restricted research database search in

regards to the number of databases searched. Research could also be found in other databases that were not considered to contain reliable information, leaving the potential of newer research articles to be utilized in the presentation of data. Limited research sources were utilized, which also left out the potential of newer data to be used. These limitations can be overcome in future studies and reviews by using more databases to find more resources.

Future Research

Future research that can investigate the full effectiveness of KMC should be considered and recommended to ensure the utilization of change theory in its implementation. Implementation on premature infants recovering from surgical procedures is one topic that can focus on the recovery period of the infant. Another future research focus can be on KMC implementation on full-term infants recovering from birthing complications. Birthing complications have the potential to cause neurodevelopmental delays found in premature infants. If premature infants show reduced incidence and risk of these delays with the implementation of KMC, it is reasonable to hypothesize the same or similar outcomes in those that are full term. Implementation on infants that are adopted at birth should also be considered, especially if both parents are unaccepting of the child due to stress of caring for a preterm or even full infant. Furthermore, implementation on infants of same-sex couples should also be considered with the research of either gender having positive outcomes when the intervention of KMC is in place.

Conclusion

The purpose of this review was to investigate the benefits of KMC on premature infants in regards to overall health, feeding and neurobehavioral development, and stress. It is clear from the research reviewed that KMC is an effective intervention in the care for premature infants.

Implementation of this intervention is still being minimally used, but the research presented shows it is a beneficial addition to the standard of care for premature infants. This field of inquiry is crucial as caring for patients no matter the age is at the core of nursing and medical fields. Helping give infants the best chance at life is also a vital benefit to the new parents. The utilization of KMC proves to be the simple solution to an obvious problem in the field of neonatal health.

References

Albishry, S. N., Shouk, M. E., Alkhaldi, S., Almowlad, N., & Omer, T. (2018). The effectiveness of kangaroo mother care (KMC) on premature infant health progression in a neonatal care unit in maternity and children's hospital, Jeddah. *International Journal of Nursing Didactics*, *8*(09), 27–33. https://doi.org/10.15520/ijnd.v8i09.2307

Chavula, K., Guenther, T., Valsangkar, B., Lwesha, V., Banda, G., Bøe Wensaas, M., Luhanga, R., Chimtembo, L., Kinney, M. V., & Dube, Q. (2020). Improving skin-to-skin practice for babies in kangaroo mother care in Malawi through the use of a customized baby wrap: A randomized control trial. *PLOS ONE*, *15*(3), 1–16. https://doi.org/10.1371/journal.pone.0229720

El-Farrash, R. A., Shinkar, D. M., Ragab, D. A., Salem, R. M., Saad, W. E., Farag, A. S., Salama, D. H., & Sakr, M. F. (2019). Longer duration of kangaroo care improves neurobehavioral performance and feeding in preterm infants: A randomized controlled trial. *Pediatric Research*, *87*(4), 683–688. https://doi.org/10.1038/s41390-019-0558-6

Kumbhojkar, S., Mokase, Y., & Sarawade, S. (2016). Kangaroo mother care (KMC): An alternative to conventional method of care for low birth weight babies. *International Journal of Health Sciences and Research*, *6*(3), 36–42.

Mishra, P., Rai, N., Mishra, N. R., & Ranjan Das, R. (2017). Effect of kangaroo mother care on the breastfeeding, morbidity, and mortality of very low birth weight neonates: A prospective observational study. *Indian Journal of Child Health*, *04*(03), 379–382. https://doi.org/10.32677/ijch.2017.v04.i03.025

Rahman, M., Azad Chowdhury, M., Hoque, M., Jahan, N., & Chandra Shaha, L. (2017).

Kangaroo mother care for low birth weight babies: A randomized controlled trial in a tertiary care hospital of Bangladesh. *Journal of Pediatrics & Neonatal Care*, *7*(2), 1–7. https://doi.org/10.15406/jpnc.2017.07.00285

Sari, I. P., Ardillah, Y., & Widyastuti, T. A. (2016). The determinants of infant mortality in neonatal period. *Jurnal Kesehatan Masyarakat*, *12*(1), 139–149. https://doi.org/10.15294/kemas.v12i1.4882

Srinath, B. K., Shah, J., Kumar, P., & Shah, P. S. (2016). Kangaroo care by fathers and mothers: Comparison of physiological and stress responses in preterm infants. *Journal of Perinatology*, *36*(5), 401–404. https://doi.org/10.1038/jp.2015.196

Swarnkar, K., & Vagha, J. (2016). Effect of kangaroo mother care on growth and morbidity pattern in low birth weight infants. *Journal of Krishna Institute of Medical Sciences University*, *5*(1), 91–99.