

# **BARRIERS TO THE IMPLEMENTATION OF KANGAROO CARE IN NEONATAL INTENSIVE CARE UNITS: AN INTEGRATED REVIEW**

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## **ABSTRACT**

Preterm birth is a global health problem, with over 15 million babies born before 37 weeks every year. Premature babies experience more health problems and longer hospital stays than term babies, and their families experience significant medical and economic costs. The use of kangaroo care to improve outcomes for premature and low birth-weight infants is well supported in the literature but is not well utilized in practice. The purpose of this integrative review is to identify common barriers that prevent the implementation of kangaroo care as a standard of practice in neonatal intensive care units. A review of the literature was conducted using EBSCO, CINAHL, PubMed and Google Scholar. Over 1800 peer-reviewed articles were discovered, from which nine were chosen based on a review of the abstracts. The chosen studies were a mixture of quantitative and qualitative reviews, meta-analyses and one systematic review. Across the literature, nurses were generally found to be positive about and willing to put kangaroo care into practice, but the common barriers found in the review were inadequate knowledge and low confidence in skills necessary to perform kangaroo care, absence of guidelines and policies, and providers' beliefs in the practice and its benefits. The conclusion made by the literature is that these barriers can be overcome through the development and implementation of a staff education program to provide nurses with the knowledge that they need to make kangaroo care a part of routine care in the neonatal intensive care unit.

## **INTRODUCTION AND BACKGROUND**

According to the World Health Organization (WHO), preterm birth is a global public health problem. It is the leading cause of death in children under five years old, and many who do survive face a lifetime of disability (2018). The Center for Disease Control (CDC) states that one in ten babies are born too early in the United States (2019) and around the world; about 15 million preterm births occur every year (Pratomo et al., 2020). Babies born before 37 weeks gestation are premature, and infants under 2500 grams are considered low birth weight (LBW). Both preterm and LBW infants may have more health problems and usually have longer hospital stays than term and normal birth weight infants (Pratomo et al., 2020). In addition, families of premature and LBW infants experience significant medical and economic costs, as does the U.S. healthcare system itself. In fact, the costs associated with premature birth exceed 26.2

billion dollars a year, of which 16.9 billion dollars is for medical and health care costs alone (Mayers & Hendricks-Munoz, 2014).

Babies requiring special care or intensive care are taken away from their mothers immediately after birth. Although this is necessary due to the medical needs of the infant, this separation very often continues throughout the infants' stay in the hospital. In the Neonatal Intensive Care Unit (NICU) environment, these babies are exposed to abnormally bright lights, much visual stimulation and high-frequency sound such as voices, monitors, and alarms at a time when they would normally be inside the womb experiencing much lower intensity stimulation and low-frequency sound (El-Metwally & Medina, 2020).

Infants experience tactile stress as well. Instead of the steady, soothing uterine environment, babies in the NICU are put into isolettes, away from their mothers, and are in constant contact with fabrics and countless painful medical procedures. Therefore, the NICU environment may contribute to subtle changes in the brain that could be translated into long-lasting sensory deficits (El-Metwally & Medina, 2020). Trying to survive in the unnatural environment of the neonatal intensive care unit, these babies are very often denied the important and essential physical contact with their mothers that they need, resulting in negative health consequences for both mother and baby (Stadd et al., 2020). For these infants, separation from their mothers not only increases the chance of future mental and physical disorders but is also linked to a shortened lifespan (Cunningham et al., 2021).

Kangaroo care (KC), which refers to an infant's intermittent skin-to-skin contact on the mother's, or even father's bare chest at different periods during the day, is widely recognized as an extremely effective method to improve the outcomes for these preterm and LBW infants while also reducing the cost to healthcare systems. Decades of research have clearly shown the benefits of kangaroo care. Not only is KC highly recommended for full-term infants, but it is also recommended as a standard of care by the American Academy of Pediatrics, the American Heart Association, the American College of Obstetricians and Gynecologists, the Association of Women's Health, Obstetrics and Neonatal Nurses and the National Association of Neonatal Nurse (Ludington-Hoe, 2011). Research has clearly indicated that the use of kangaroo care for premature babies provides the same beneficial outcomes as it does for full-term babies (Cunningham et al., 2021). Kangaroo care provides many physiologic, developmental and psychological benefits for premature or LBW infants, and the greater number of hours per day that it is practiced, the greater the benefits (Cunningham et al., 2021).

The many benefits of kangaroo care in the preterm and LBW infant population have been well researched over decades. According to Ludington-Hoe (2011), KC reduces hospital stays as well as "promotes physiological stability, regular breathing, less energy spent on keeping warm, increasing the rate of weight gain, better sleep cycles contributing to brain maturation, better cerebral oxygenation, better gastrointestinal hormones, less risk of infection and a decreased response to pain." The

skin-to-skin contact causes the release of oxytocin, which is what causes most of the calming, beneficial physiological effects, including decreasing response to pain (Cunningham et.al., 2021). Besides benefits to the infant, KC also has been shown to decrease mothers' stress, as well as anxiety and depression, by allowing for bonding between mother and child and provides the type of environment that improves infant development, both cognitive and emotional (Coutts, 2021).

Despite all the evidence that supports the improved outcomes provided by kangaroo care in premature and LBW infants, utilization of this practice remains low. Kangaroo care not only benefits these infants and their families, but it also is a proven cost-effective practice that saves money at hospitals, so it is surprising that less than 20% of institutions report implementing it at all (Pratomo et al., 2020). Barriers cited by nursing staff included worries about infant safety, lack of support by hospital, lack of KC policies and protocols, providers' belief in the practice and its benefits, disruption of NICU routine and lack of education and training in this area (Coutts, et al., 2021). To change attitudes and perceptions about kangaroo care among healthcare staff and increase utilization of kangaroo care in neonatal intensive care units, education and skills training for staff is of utmost importance.

#### **LITERATURE REVIEW**

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The PICO question used to guide this literature review was; Among neonatal intensive care nurses, does providing staff education on the proper techniques of as well as the benefits of kangaroo care increase the likelihood of the adoption of kangaroo care as a standard of care in the NICU? Based on this question, a review of the literature was conducted using EBSCO, CINAHL, PubMed and Google Scholar seeking scholarly evidence on this question. The keyword search included kangaroo care, neonatal intensive care unit, staff education, implementation, benefits, resistance and barriers. Over 1800 scholarly, peer-reviewed articles were discovered using these search terms. When limiting the time range to 2014-2021, this was reduced to 974 articles. Of these, nine were chosen to be included in the literature review. This was based on a review of the abstracts, and then selected based on their relevance to staff education issues and kangaroo care. The studies chosen were a mixture of qualitative and quantitative studies, one clinical guideline, a meta-analysis and one systematic review of the literature and are summarized in the literature matrix (see Appendix A). Two common themes emerged from the literature review; facilitators and barriers to KC implementation and the need for further education of nurses to overcome barriers to implementation.

#### **FACILITATORS AND BARRIERS TO KC IMPLEMENTATION**

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Three quantitative studies by Almutairi et al. (2016), Deng et al. (2018), and McGowen et al. (2017) as well as two qualitative studies by Coutts et al. (2017) and Ferreira et al. (2019) addressed facilitators and barriers to KC implementation among NICU nurses.

Almutairi et al., (2016) acknowledged the low incidence of the use of kangaroo care (KC) in neonatal intensive care units in the United States, despite the recommendation of the Centers for Disease Control and surprising considering how long KC has existed. The authors hypothesized that the resistance of staff to utilization of KC is partly due to the nurses' inadequate knowledge and low confidence in skills competency. While continuing education does improve nurses' knowledge and skills needed to perform KC, Almutairi et al. (2016) set out to test how participation in a kangaroo care certification course would affect nurses' knowledge and skills competency. Utilizing a pre-test post-test quasi-experiment, the Kangaroo Care Knowledge and Skills Confidence Tool was administered to 68 registered nurses at a 2.5-day course on kangaroo care evidence and skills. The results varied among the individual nurses but did indicate that nurses' knowledge and confidence in their skills improved following this course, therefore suggesting the need for continuing education among nurses that work with the neonatal population.

Likewise, Deng et al. (2018) researched factors that affected nurses' knowledge, beliefs and practices related to the use of KC in NICUs in China. Again, despite the recognition worldwide of the effectiveness of KC in improving preterm infant outcomes, and the recommendation that it be a standard of care, it is an uncommon practice in China. Using a descriptive, cross-sectional design, neonatal nurses (n= 830) completed an online questionnaire. A total of 48.2% of nurses reported that they practiced KC, but the scores in all four scales were primarily influenced by experience in using KC. The results noted that nurses that practiced KC possessed a higher level of knowledge and perceived a lower number of barriers to the practice in their unit, and the participant's role in the NICU was a strong factor on perceptions about KC and the practice level employed. In addition, the knowledge and practice scores were heavily influenced by the education level of the nurses and the NICU care level. The study found that one of the major barriers to practice was reluctance on the part of physicians, nurses and even parents. The study concluded that knowledge, attitudes and levels of practice related to KC were low, with results suggesting that by leadership and experienced practitioners initiating education and clinical training, nursing knowledge and awareness of the effectiveness of KC would improve, thus lowering or removing the reluctance to implement KC.

A study done by McGowan et al. (2017) noted that despite the overwhelming evidence regarding the benefits of KC, not only are there still many NICU nurses who are reluctant to start KC with preterm infants, but they also lack knowledge about which infants are eligible for KC. Their study set out to determine the extent that KC practice is implemented among infants receiving high technology intensive care using a survey exploring nurses' knowledge, practice of KC, and perceptions and barriers regarding KC, and based on the findings of the study, make recommendations for the development of practice and policies and to suggest strategies for educating nurses on the effective use of KC.

Three neonatal units in Northern Ireland were included in the study and were chosen to explore the use of KC in high-intensity, high-technology environment of Level 3 neonatal intensive care units. McGowen et al. (2017) employed a survey research design using the Kangaroo Care Questionnaire, which consisted of four scales in the areas of knowledge, practice, barriers and perceptions. This tool's reliability was supported by employing a Cronbach's Alpha reliability coefficient for each of the four scales. The conclusion drawn from the results of the study indicated that nurses are willing and wanting to develop the practice of KC, but that educational interventions, including specific and clear guidelines, are necessary to facilitate the adoption of KC in Level 3 NICUs. McGowen et al. (2017) believed that the study showed that the development of a specific and practical training program, grounded in theory, will assist in promoting KC in NICUs in Northern Ireland and beyond.

The environment in neonatal intensive care units is stressful for premature infants and very often does not meet their neurodevelopmental needs. Coutts et al., (2021) states that while KC is an evidence-based practice that has been shown to improve both long- and short-term outcomes for these infants, however, acceptance and use of the KC in healthcare facilities remains low. Coutts et al. (2021) conducted a qualitative study in 11 NICUs ranging in size from 6 beds to 70 beds, from less acute to high level intensive neonatal care, with the purpose of identifying and reporting healthcare providers' perspectives on the barriers to carrying out KC as well as what facilitates its use. Four predominant themes emerged from the study: the physical environment of the unit, the provider's belief about KC itself, variations in clinical practice and parental presence. Depending on the individual unit, these factors could be either a barrier or a facilitator to the practice of KC. It indicated that one uniform approach cannot be used to guide KC practice, as each unit has its own unique barriers and facilitators. Rather, Coutts et al. (2021) suggested that support for improving parent presence, changing healthcare provider beliefs, coming up with creative solutions in unit design and space limitations and the development of guidelines for KC practice in NICUs are all needed to change practice and decrease barriers to KC implementation at both local and system levels.

Ferreira et al. (2019) set out to study the perceptions of nurses working in maternal-child units regarding nursing knowledge, barriers and facilitators related to the implementation of KC on their units. The conclusion drawn by the study was that having only partial knowledge of the practice as well as lack of experience in using KC led to barriers in its implementation. Ferreira et al. (2019) also noted that although some nurses recognized the benefits of KC, staff resistance, as well as lack of institutional support, contributed to the low use of KC in practice.

#### **EDUCATION TO OVERCOME BARRIERS TO KC**

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Two quantitative studies by Mayers et al. (2014) and Stadd et al. (2019), a qualitative study by Pratomo et al. (2020) and a literature review by Cunningham et al. (2021) all looked specifically at the need for education and training programs to break down

barriers and misconceptions regarding KC and thus increase the implementation of KC in the NICU.

Mayers et al. (2014) also noted barriers to KC use and shared that despite all the benefits of KC to both infants and parents, barriers such as the culture of the NICU, practitioner's perception of its value and the believed difficulty of providing KMC for preterm infants impedes its use in many facilities. The authors hypothesized that feeling competent with the transfer of preterm babies on respiratory support greatly impacted the nurses' willingness to use it in their practice. In the authors' prospective cohort study of NICU nurses (n=35) at one hospital in New York City, an educational curriculum for nurses was provided in three separate workshops, including 7.5 hours of didactic teaching by the medical staff on such topics as the scientific basis of KC, the impact of KC on breastfeeding success, how to support families during KC and how to assess infant as well as parent readiness for KC (Mayers et al., 2014). In addition, there was a simulation component of the curriculum which included five medical scenarios as well as role-play. This study demonstrated that providing education and improving the competency of nurses in the use of KC translated into higher use of KC in infants eligible for such practice. They also concluded that the structured KC education curriculum improved the comfort levels of NICU nurses as well as their ability to provide KC in all levels of KC transfer, especially with intubated infants and those infants receiving other types of respiratory support. It was concluded that to improve nurses' comfort with using KC and decrease barriers to its use in NICUs, standardized and comprehensive training aimed at increasing competency is the best approach. In addition, ongoing support to improve nursing comfort in the utilization of KC should be linked with this training.

Stadd et al. (2019) noted that even though evidence shows that KC improves infant-parent bonding and neonatal outcomes worldwide, concerns such as infant safety, interruption of workflow and the readiness of parents continue to inhibit KC practice in neonatal intensive care units. To address this issue, they developed and combined a KC pathway into a simulated educational training program for both staff and parents. Its aim was to encourage earlier and more frequent use of KC by increasing both knowledge and comfort with this intervention. Their study, conducted over four months in a 45-bed level 4 NICU teaching hospital in a mid-Atlantic urban area, collected two months of pre-and post-intervention surveys to assess nursing knowledge and comfort level with KC. All clinical staff was invited to participate, and out of 150 nurses, 128 completed the pre-test survey. Of the 128 pretest survey subjects, 80 completed the post-test survey. The authors noted that the frequency of KC happened 2.4 times more after the educational intervention, and the percentage of KC occurrences for infants that were intubated nearly doubled. Also, the posttest survey scores pertaining to nursing knowledge and comfort level greatly improved.

Pratomo et al. (2020), acknowledged that because the practice of KC requires providers to be competent as well as strongly committed, training and observation of

staff needs to occur during KC implementation. Using a qualitative design, Pratomo et al. (2020) conducted a study to assess these areas in two district hospitals in Indonesia to act as baseline data to help identify existing barriers to adopting KC as a standard of care. Data was collected through in-depth interviews, group discussions and focus group discussions. The study supported that staff knew about the benefits of KC and were also able to assess and identify KC eligible infants. Staff knowledge was a result of personal experience as well as observation of others. Some misconceptions were present however, including the idea that infants in isolettes were not candidates for KC, and that KC could not be implemented without the use of a special gown to hold the baby. Pratomo et al. (2020) shared that these incorrect perceptions could be caused by lack of formal training in KC practice and suggested that these misperceptions should be considered when planning KC training and education.

Finally, a literature review by Cunningham et al. (2021) found that lack of training and absence of guidelines for KC led to negative attitudes regarding KC and consequently an unwillingness to use it in practice. Once a training program was implemented, nurses realized the benefits of KC to the infant and as a result promoted its use on their units. Developing staff training and education program increases knowledge, skills and confidence levels in nurses, causing them to support the use of KC and thus more likely to use it in their practice.

#### **SUMMARY**

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Across the literature, nurses were generally found to be positive about and willing to put kangaroo care into practice, but the common barriers found in the review were inadequate knowledge and low confidence in skills necessary to perform kangaroo care, absence of guidelines and policies, and providers' belief in the practice and its benefits. These barriers can be overcome through the development and implementation of a staff education program to provide nurses with the knowledge that they need to make kangaroo care a part of routine care in the neonatal intensive care unit.

The literature stressed the need for guidelines and policies for KC (Coutts et al., 2021; Cunningham et al., 2021, McGowen et al., 2017), as well as KC education for staff to implement KC as a standard of care in the NICU (Almutairi et al., 2016; Coutts et al., 2021; Deng et al., 2018; Ferreira et al. (2019), Mayers et al., 2014; McGowen et al., 2017; Pratomo et al., 2020; Stadd et al., 2019). This theme was consistently present even in studies that took place in countries other than the United States. It was also noted that not all NICUs are the same in terms of culture, physical set-up, provider practices and parental presence, so each setting must be treated as unique in terms of guidelines and policies as well as educational methods (Coutts et al., 2021). Even so, the literature cited above supports that for KC to become standard practice in neonatal units, it is essential to provide staff with educational and training programs (Almutairi et al., 2016; Coutts et al., 2021; Cunningham et al., 2021, Deng et al., 2018; Mayers et al., 2014; McGowen et al., 2017; Pratomo et al., 2020; Stadd et al., 2019) as well as follow-up in the months following such programs (Mayers et al., 2014; Pratomo et al., 2020). Nurses were

generally found to be positive about and willing to put KC into practice, but often lacked the knowledge and skills necessary to do so (Almutairi et al., 2016; Cunningham et al., 2021, Deng et al., 2018; Ferreira et al., 2019, Mayers et al., 2014; McGowen et al., 2017). Having guidelines in place and having a commitment to developing and using an educational program for all nursing staff will greatly increase the likelihood of them utilizing evidence-based KC in their daily practice (Almutairi et al., 2016; Coutts et al., 2021; Cunningham et al., 2021, Deng et al., 2018; Mayers et al., 2014; McGowen et al., 2017; Pratomo et al., 2020; Stadd et al., 2019).

## CONCLUSION

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This integrated review is an attempt to answer the question, “Among neonatal intensive care nurses, does providing staff education on the proper techniques of as well as the benefits of kangaroo care increase the likelihood of the adoption of kangaroo mother care as a standard of care in the NICU?” Multitudes of research over the past forty years have supported the use of KC for the good of both mothers and infants and clearly indicates the serious gap that exists between the research and practice. By providing nursing staff with a quality educational program as well as the KC pathway tool, the use of KC in the NICU will increase greatly. As more and more nurses adopt KC as routine practice, maternal satisfaction and confidence will increase, maternal stress will decrease, and outcomes for our preterm and LWB infants will improve.

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D. VENCE: KANGAROO CARE IN NEONATAL INTENSIVE CARE UNITS

APPENDIX A

NURS 694: Nursing Graduate Capstone Course

Review Matrix for Integrated Review

| Authors, Title, Journal  | Year Pub | Study Purpose & Study Type  | Dependent variable   | Independent Variable/s | # Subjects and Sample Design                                     | Sample Characteristics   | Intervention   | Research Instruments and/or Data Source     | Results   | Comments |
|--|----------|---|--|------------------------|--|--|--|---|---|----------|
| Almutairi, W. M., & Ludington-Hoe, S. M. (2016). Kangaroo care education effects on nurses' knowledge and skills confidence. <i>The Journal of Continuing Education in Nursing</i> , 47(11), 518-524. <a href="https://doi.org/10.3928/00220124-20161017-11">https://doi.org/10.3928/00220124-20161017-11</a>  | 2016     | To determine the effects of a kangaroo care certification course on nurses' knowledge and skills confidence.<br><br>Quantitative study.                                     | Whether or not the pre and post tests were returned by subjects. Varied individual answers based on subject's interpretation of questions. | Kangaroo Care Course   | 68 subjects.<br><br>Pre-test post-test quasi experimental design | Registered nurses, majority white, 36-65 years old who had practiced 10 years or less in NICU, L&D & newborn nursery   | Kangaroo Care Certification Course   | Kangaroo Care Knowledge and Confidence Tool | Knowledge posttest mean scores were significantly higher than pretest scores, and the total skills confidence scores were significantly higher than the pretest mean scores.  |          |
| Coutts, S., Woldring, A., Pederson, A., De Salaberry, J., Osiovič, H., & Broto, L. A. (2021). What is stopping us? an implementation science study of Kangaroo Care in British Columbia's Neonatal Intensive Care Units. <i>BMC Pregnancy and Childbirth</i> , 21(1). <a href="https://doi.org/10.1186/s12884-020-03488-5">https://doi.org/10.1186/s12884-020-03488-5</a>                                      | 2021     | Qualitative study. To identify and describe healthcare providers perspectives on the barriers and facilitators of implementing kangaroo care.                               | N/A  | N/A                    | 35 subjects.<br>Purposeful sampling employed.                    | 3 neonatologists, 9 NICU nurses, 9 nurse educators, 5 NICU clinical managers, 3 occupational therapists, 1 pediatrician, 1 midwife, 1 respiratory therapist, 1 dietician, 1 physical therapist and 1 lactation consultant. | Face to face semi-structured interviews, recorded when possible and transcribed. Detailed interview notes taken if recording not possible. | N/A   | Findings suggest that factors such as unit routine, clinical practices and providers beliefs shaped the providing of KC to varying degrees, but depended also on other factors like physical layout, availability of reclining chairs and parental presence.  |          |
| Cunningham, C., Patton, D., Moore, Z., O'Connor, T., Bux, D., & Nugent, L. (2021). Neonatal kangaroo care - what we know and how we can improve its practice: An evidence review. <i>Journal of Neonatal Nursing</i> . <a href="https://doi.org/10.1016/j.jnn.2021.10.004">https://doi.org/10.1016/j.jnn.2021.10.004</a>   | 2021     | Review past and current kangaroo care practice and explore the literature relating to improving kangaroo care for preterm infants.<br><br>Study type was literature review. | N/A  | N/A                    | Literature review  | N/A  | N/A  | N/A   | Lack of training and formal education greatly inhibits KC utilization in the NICU. Nurses' confidence level in determining which infants are eligible for KC determines whether or not it is offered. This leads to inconsistent practices for the infant on a daily basis. Neonatal nurse education in KC is vital to the increase of its practice in NICUs.   |          |
| Deng, Q., Zhang, Y., Li, Q., Wang, H., & Xu, X. (2018, July 23). <i>Factors that have an impact on knowledge, attitude and practice related to Kangaroo Care: National Survey study among neonatal nurses</i> . Wiley Online Library. Retrieved October 21, 2021, from <a href="https://onlinelibrary.wiley.com/doi/full/10.1111/jocn.14556">https://onlinelibrary.wiley.com/doi/full/10.1111/jocn.14556</a> . | 2018     | Explore factors that impact nurses' knowledge, perceptions and practice related in kangaroo care in neonatal intensive care units in China.<br><br>Quantitative study.      | Subjects personal opinions, beliefs and experience when answering questions.<br>Compliance with responding to survey.                      | Questionnaire          | 830 subjects.<br>Descriptive cross-sectional survey.             | Neonatal nurses  | Online questionnaire   | Modified Kangaroo Care Questionnaire        | Results of questionnaire showed that KC is an uncommon practice in China. Nurses lacked knowledge and awareness of KC, and barriers that limit the use of KC are multidimensional. Charge nurses and educators should provide education to improve perceptions among nurses and doctors. Clear guidelines and consistent protocols should be put into place and professional education and skills training should be implemented in order to optimize the utilization of KC in NICUs. |          |

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|---|------|--|---|-----------------------------|---|--|---|--|--|
| Ferreira, D. de, Silva, M. P., Galon, T., Goulart, B. F., Amaral, J. B., & Contim, D. (2019). Kangaroo method: Perceptions on knowledge, potentialities and barriers among nurses. <i>Escola Anna Nery</i> , 23(4). <a href="https://doi.org/10.1590/2177-9465-ean-2019-0100">https://doi.org/10.1590/2177-9465-ean-2019-0100</a>   | 2019 | To analyze the knowledge of KC, benefits of KC and barriers related to the implementation of KC among nurses who work in a maternal-infant unit.<br><br>Qualitative study.   | N/A   | N/A                         | 8 nurses<br><br>Exploratory-descriptive research design | Full time nurses who worked in intermediate neonatal care and neonatal intensive care units, between 24-35 years of age. Professional experience ranged from two to eleven years, while time at studied hospital was 2-5 years     | Pretest followed by face to face interviews.            |  | Study revealed the lack of knowledge about the benefits of KC for babies and their families. In order to increase the nurses' knowledge and comfort with skills relating to KC, training and education must be provided. Lack of training and structure within the organization impeded the use of KC as a daily practice.   |
| Mayers, R., & Hendricks-Munoz, K. (2014). A neonatal nurse training program in Kangaroo Mother Care (KMC) decreases barriers to KMC utilization in the Nicu. <i>American Journal of Perinatology</i> , 31(11), 987-992. <a href="https://doi.org/10.1055/s-0034-1371359">https://doi.org/10.1055/s-0034-1371359</a>   | 2014 | To assess the impact of a nurse simulation training program on perception of KC value and transfer skill competency<br><br>Quantitative study.   | Individual responses to training program and answers.                                       | Simulation training program | 30 subjects.<br><br>Prospective cohort study.           | 70% Asian<br>13% white<br>2% other<br><br>28 females and 2 males with an average age of 46.9. Average years of work experience was 20.6.   | Nurse simulation training program                       | 8-item Likert skill survey tool and a 24-item Likert developmental care survey tool. | Simulation based KC education program improved nurses' beliefs in the value of KC, increased their competency and comfort in transferring infants for KC and was successful in promoting KC practice for premature infants in the NICU.  |
| McGowan, J. E., Naranian, T., & Johnston, L. (2017). Kangaroo care in the high-technology neonatal unit: Exploring evidence-based practice, policy recommendations and education priorities in Northern Ireland. <i>Journal of Neonatal Nursing</i> , 23(4), 174-179. <a href="https://doi.org/10.1016/j.jnn.2017.03.001">https://doi.org/10.1016/j.jnn.2017.03.001</a>                 | 2017 | To investigate the extent of KC practice in Northern Ireland by exploring nurses' knowledge, barriers to practice and perceptions regarding KC and based on findings, make recommendations for the development of policy and practice, and to suggest strategies in education in order to increase effective use of KC.<br><br>Quantitative study. | Individual answers to questions based on personal beliefs, attitudes and comfort level.     | questionnaire               | 78 subjects<br><br>Survey research design.              | NICU nurses from three neonatal units in Northern Ireland. 75 were female, 3 were male. 50% had been working in the NICU for 1 to 5 years, while 17% had been working there for 6-10 years. 60% had bachelor's degrees.            | Question-naire  | Kangaroo Care Questionnaire  | Study provided evidence that suggested that nurses are willing to practice KC, but that development of a context-specific and theoretically grounded training program, including specific guidelines, are necessary to facilitate the use of KC in NICUs.  |
| Pratomo, H., Amelia, T., Nurlin, F., & Adisasmita, A. C. (2020, July 21). <i>Knowledge and perceptions of Kangaroo Mother Care among health providers: A qualitative study</i> . Clinical and Experimental Pediatrics. Retrieved October 21, 2021, from <a href="https://www.cep.org/journal/view.php?number=20125555339">https://www.cep.org/journal/view.php?number=20125555339</a> . | 2020 | To assess knowledge and perceptions about KC among health care providers.<br><br>Qualitative study.  | N/A   | N/A                         | 32 subjects<br><br>Qualitative design                   | 24 health care providers (RNs, pediatricians, midwives, and 5 from hospital management. 16 people had associate degrees, 3 had bachelor's degrees and 13 had masters degrees. Employment duration ranged from 1 month to 35 years. | In-depth interviews, focus groups and group discussion. | N/A  | Study concluded that for most providers, knowledge about KC is mostly based on their own personal experiences and observations. Some barriers to its use were concerns about infant safety and the existing perception that stable condition of infant is a requirement to be eligible for KC. These perceptions should be taken into account when designing training in the future. |
|   | 2019 | To test whether a KC pathway developed and integrated with a high technology simulation educational program for NICU staff and families would promote earlier and  | Individual subjects response to training program as well as personal attitudes and beliefs. | Training program            | 68 subjects.<br><br>Quality improvement design          | NICU nurses at a level IV teaching hospital in a mid-Atlantic urban district.  | KC pathway and simulation training.                     | N/A  | Evidence from this study shows that nurses and families require ongoing education and simulation training to improve their comfort with the practice and to increase the frequency of KC. The incidence of KC episodes increased for infants requiring   |

D. VENCE: KANGAROO CARE IN NEONATAL INTENSIVE CARE UNITS

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| <p>Stadd, K., Diehl, B., Yenokyan, G., &amp; Aucott, S. W. (2020). A kangaroo care pathway for NICU staff and Families. <i>Advances in Neonatal Care</i>, 20(1), 14–24. <a href="https://doi.org/10.1097/anc.0000000000000667">https://doi.org/10.1097/anc.0000000000000667</a></p> |  | <p>more frequent KC by increasing knowledge and comfort with the practice.</p> <p>Quantitative study.</p> |  |  |  |  |  |  |  |  |
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