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Neonatal nurses' knowledge and beliefs regarding kangaroo care with preterm infants in an Irish neonatal unit

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KEYWORDS
Kangaroo care;
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Beliefs;
Research

Abstract *Aim:* To investigate Irish neonatal nurses' knowledge and beliefs of Kangaroo care.
Background: Although kangaroo care existed in other countries for 25 years, it is a new occurrence in Irish neonatal care. A review of the literature suggests that, while it demonstrates benefits for both infants and parents, some neonatal nurses do not exhibit an awareness of current kangaroo care research, or hold positive beliefs towards its use with preterm infants. As they have the most parent-infant contact and influence over whether kangaroo care is carried out, their knowledge and beliefs are of importance.
Method: A quantitative, descriptive design with neonatal nurses ($n = 62$) was used.
Findings: Fifty six neonatal nurses (90.3%) believed kangaroo care a safe alternative for stable growing preterm infants, agreeing on the benefits for both infants and parents The overall level of neonatal nurses' knowledge of kangaroo care varied from good to excellent, the lowest score being 35/51. Results indicated nurses' uncertainty regarding kangaroo care with intubated infants, and infants requiring blood pressure support, umbilical lines and phototherapy. This suggests the need to provide education on kangaroo care to foster the development of more positive beliefs and increase staff knowledge of potential adverse effects.
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Keypoints

This paper summarizes research that explored Irish neonatal nurse's knowledge and beliefs regarding kangaroo care with preterm infants. A discussion on the benefits of Kangaroo care for both infants and parents is presented. The methodology and details of the research questionnaire used are outlined. Findings revealed that despite not receiving any formal instruction in kangaroo care, the neonatal nurses in this study were more informed in their research-supported knowledge, as opposed to their research-supported beliefs. Irish neonatal nurses were found to have levels of knowledge and beliefs similar to those demonstrated in previous research in countries where kangaroo care has been in use for much longer. Recommendations for future practice include the need for neonatal nurses to remain abreast of current research findings. Comprehensive education on kangaroo care is necessary to foster the development of more positive beliefs and ensure that any staff knowledge deficits regarding possible adverse effects are addressed.

Introduction & background

For small preterm infants, prolonged neonatal nursing and medical care is important for their survival. However, kangaroo care is an effective method to meet infant's equally important needs for warmth, stimulation, parental contact and love (WHO, 2003). Kangaroo care describes the practice of holding a preterm or low birth weight infant in an upright, prone position in skin-to-skin contact against their parents' chest, dressed in a nappy, with a blanket or clothes covering the infants back (DiMenna, 2006). It occurs both in hospital and at home until at least the 40th week of corrected gestational age (Cattaneo et al., 1998). There is no defined optimum length of time to carry out kangaroo care, although the WHO (2003) and Charpak et al. (2005) suggest 2 h or more. If correctly applied, kangaroo care can be safely used for stable low birth weight infants at any level of care (Cattaneo et al., 1998; Charpak and Figueroa, 2001).

There are many documented physiological and emotional benefits of kangaroo care for infants and their parents. Kangaroo care offers immediate and long term benefits for infants such as increased physiological stability (Bergman et al., 2004; Ludington-Hoe et al., 2004; Sontheimer et al., 2004), improved brain growth and development (Tessier et al., 2003; Rojas et al., 2003), and increased sleep and improved behavioural outcomes (Ohgi et al., 2002; Ludington-Hoe et al., 2006). While there appears to be agreement in the research regarding the positive effects of kangaroo care on thermoregulation, oxygenation and behavioral states in preterm infants, there are conflicting results in the literature for its effectiveness with infants less than 28 weeks corrected gestational age, weighing $<$1000 g, or ventilated, in terms of their energy expenditure, heart rate, respiratory rate, oxygen saturation, growth and length of stay (Bauer et al., 1998; Bohnhorst et al., 2001; Charpak et al., 2001). Overall, the research advises practitioners wishing to carry out kangaroo care to proceed with caution in preterm infants who are under 1000 g, on mechanical ventilation, less than 28 weeks corrected gestational age or less than one week after birth.

Some studies have been inconclusive in demonstrating more favourable outcomes when comparing infants receiving kangaroo care to infants receiving traditional care, but no study has demonstrated adverse effects to parents or infant (Chwo et al., 2002; Conde-Agudelo et al., 2003; Anderson et al., 2003a; Miles et al., 2005; DiMenna, 2006). Parents also appear to benefit from kangaroo care with increased parent-infant interaction and emotional bonding (Tessier et al., 1998; Feldman et al., 2002; Gale Roller, 2005; Tallandini and Scalembra, 2006), enhanced and more prolonged duration of breastfeeding (Anderson et al., 2003a; Rojas et al., 2003), and increased parental satisfaction rates (Carfoot et al., 2005). Kangaroo care is believed to strengthen the connection between infant and parent, with each becoming more sensitive to each other (Tessier et al., 1998; Anderson et al., 2003a). Although parents value the kangaroo care experience, they need attention and assistance from neonatal nurses to alleviate any of their anxieties, enhance the development of their parental role and modify the neonatal environment to optimize the kangaroo care experience for infant and parent.

The use of kangaroo care with preterm infants has been demonstrated to shorten the length of stay in hospital (Charpak et al., 1997; Tessier et al., 1998) and be professionally satisfying for neonatal nurses (Chia et al., 2006). It is also clear that healthcare professionals positively or negatively affect parental practice of kangaroo care. Some healthcare professionals question whether kangaroo care is beneficial, express concern that kangaroo care may be a burden on mothers, or consider the practice unnecessary or even unsafe (Anderson et al., 2003b). One quarter to one third of all respondents in research by Franck et al. (2002) listed staff nurses or doctors as not supporting parental holding, with 17% stating that

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nurse or doctor concerns limited parental holding. These concerns include cardio-respiratory instability, accidental extubation or dislodgement of arterial or umbilical lines during kangaroo care, and these findings were supported by similar research in Australia and France (Engler et al., 2002; Chia et al., 2006; Mallet et al., 2007). Other healthcare professionals view kangaroo care as the optimal environment for adaptation of mother and infant following a preterm birth (Kirsten et al., 2001; Anderson et al., 2003a).

Recent research pertaining to neonatal nurses' knowledge and beliefs of kangaroo care indicates that, while neonatal nurses may be aware of the research literature available on kangaroo care, their own personal knowledge and beliefs influence their encouragement or discouragement of kangaroo care with preterm infants as an evidence based practice (Engler et al., 2002; Melnyk et al., 2004; Chia et al., 2006; Mallet et al., 2007; Frasure, 2008). While kangaroo care has been in use for up to twenty-five years in some countries (Charpak et al., 2005), it is relatively new to Irish neonatal care. Nonetheless, individual nurses have a responsibility for the quality of their practice, and how they develop their practice further (McCormack and McCance, 2006). The growing acceptance of evidence-based practice indicates that nurses need to become better informed in their clinical area (Jennings and Loan, 2001). While the research evidence demonstrates the benefits of kangaroo care for infants, parents, staff and the healthcare organisation, its use in everyday neonatal nursing care is not widespread (Franck et al., 2002), particularly in Ireland. Therefore, the purpose of this research was to examine the level of research evidence based knowledge and beliefs neonatal nurses in an Irish regional neonatal unit held regarding the use of kangaroo care with preterm infants.

Methodology

The aim of the research was to examine the level of neonatal nurses' knowledge and beliefs regarding the use of kangaroo care for preterm infants, therefore a quantitative, descriptive design on a convenience sample of 62 neonatal nurses was used. Eighty-seven neonatal nurses working in a 37-bedded regional Level III neonatal unit were invited to participate, as neonatal nurses have the most infant-parent contact (Neu, 1999), are in an optimal position to closely monitor infants (Brown and Timmins, 2005) and are in a position to either advocate or discourage the use of kangaroo care in the neonatal unit (Chia et al., 2006). The nursing staff in this unit was a combination of the recent amalgamation of three distinctly separate neonatal units, and comprised of midwives, paediatric nurses, and general nurses with intensive care nursing experience. Some staff had an additional neonatal nursing qualification. For convenience and clarity, they were collectively referred to as neonatal nurses.

Instrument

The questionnaire used was a 47-item instrument that had been modified from an original questionnaire used by Engler et al. (2002). The original questionnaire had 108 items, divided into five sections, beliefs, knowledge, barriers, unit profile and respondent demographics. Due to time and resource restraints only the beliefs and knowledge sections of the original kangaroo care questionnaire were utilised for the Irish study as these were determined by Estabrooks et al. (2003), Melnyk et al. (2004), and Frasure (2008) to have the most influence on research utilisation by nurses. The revised questionnaire consisted of Likert-type scale questions regarding participants beliefs of kangaroo care and 17 true-false statements regarding kangaroo care knowledge, as well as brief demographic section seeking characteristics of the respondents such as age, basic and highest level of nursing education, present work status and primary role within the neonatal unit.

A reliability coefficient of 0.80 is considered the lowest acceptable value for a well-developed measurement instrument (Burns and Grove, 2005). Engler et al. (2002) described their personal beliefs scale as receiving a Cronbach's Alpha reliability coefficient of 0.88 and the knowledge scale as receiving a Cronbach's Alpha reliability coefficient of 0.84. This supports a claim of reasonable internal consistency for the two scales used in the questionnaire. A Cronbach's Alpha reliability coefficient was conducted on the modified questionnaire using SPSS, and a value of 0.81 was obtained, supporting the reliability of the questionnaire previously described by Engler et al. (2002). A pilot study of five participants from the intended sample of neonatal nurses was conducted to check the face validity and comprehensibility of the questionnaire for participants, and no changes were made to the format of the questionnaire based on the results of the pilot study. The research was reviewed and approved by the University Ethics Committee of the maternity hospital where the research was carried out.

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Procedure

The data was collected by means of a 47-item questionnaire previously developed by Engler et al. (2002). A one-month data collection period was used as many neonatal staff worked reduced hours. All neonatal nurses received a letter of invitation to participate in the study. Staff who consented to participate then received the questionnaire, each containing an identification number, which corresponded to a master list of staff names held by the researchers. The identification number on the questionnaire was to assist with the coding of respondents responses. Each questionnaire had a pre-addressed envelope, to ensure confidentiality of responses. A clearly marked box was at the main nurses' station in the neonatal unit for receipt of completed questionnaires in their sealed envelopes.

Analysis

Descriptive statistics were chosen to describe what neonatal nurses' personal knowledge and beliefs are regarding kangaroo care with preterm infants. Likert scales were used in the questionnaire to determine the opinions of respondents. Descriptive statistics were analysed and included frequency, percentages and measures of central tendency such as the mean and the mode. Data was analysed using SPSS computer software package (SPSS, 2006).

Results

Sample characteristics

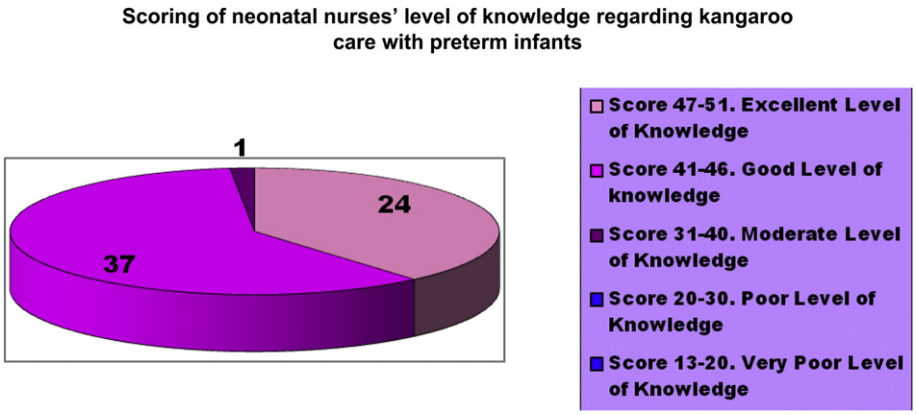
Seventy neonatal nurses in the unit (80.4%) received a questionnaire, and overall 71.3% ($n = 62$) returned the completed questionnaire for analysis. All the neonatal nurses were female, ranging in age from 24 to 60 years of age. 50% ($n = 31$) had an additional neonatal qualification and 45.2% ($n = 28$) had achieved nursing qualifications to university higher diploma level.

Knowledge

Fifty-six neonatal nurses (90.3%) believed kangaroo care a safe alternative for stable growing preterm infants, agreeing on the benefits for both infants and parents.

When questioned whether kangaroo care is contraindicated in infants less than 28 weeks gestation, 85.5% of neonatal nurses ($n = 53$) correctly indicated that this was false. Fifty neonatal nurses (80.6%) were correct that neither is kangaroo care contraindicated in infants <1000 g. Improved breathing pattern and decreased apnoeas during kangaroo care was identified by the majority of neonatal nurses (90.3%, $n = 56$). Almost all (96.8%, $n = 60$) correctly indicated that infants do not have more bradycardias, and 95.2% ($n = 59$) accurately identified that most infants do not have a decrease in temperature, during kangaroo care.

Despite answering some questions in the knowledge section incorrectly, when the responses were given a score, the overall level of neonatal nurses' knowledge in relation to kangaroo care varied from good to excellent.



Only 17.7% of neonatal nurses ($n = 11$) correctly identified that infants on vasopressors should not have kangaroo care, while 77.4%, ($n = 48$) correctly identified that infants on phototherapy treatment can participate in kangaroo care.

Forty-nine neonatal nurses (79%) correctly identified that the transfer to the parental chest was the most stressful part of kangaroo care for

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the preterm infant. Thirty two neonatal nurses (51.6%) indicated that they did not know that the rate of accidental extubation was no higher during kangaroo care than during traditional care. Additionally, 46.8% of respondents ($n = 29$) indicated that the need for pharmacological blood pressure support (vasopressors) did not prohibit the use of kangaroo care in these infants.

These findings demonstrate that, despite the relatively short time since 2003 that kangaroo care was first informally introduced into the three original neonatal units prior to their amalgamation, the neonatal nurses surveyed have a good knowledge of its beneficial effects, but still are not fully informed regarding some preterm infants suitability to participate.

Beliefs

The beliefs section of the kangaroo care questionnaire contained 25 statements regarding kangaroo care with preterm infants. The responses to 13 of these statements were evidence based and were utilised to give a score that indicated the strength of the neonatal nurses' beliefs. The neonatal nurses in this study indicated that they had strong to very strong positive beliefs regarding kangaroo care as demonstrated in the scores achieved by 63% and 23% of neonatal nurses respectively. An overwhelming majority of neonatal nurses (98.4%) indicated that kangaroo care benefits preterm infants. Forty-nine neonatal nurses (79%) considered that infants should be allowed to participate regardless of gestational age, while 71% indicated that infants should be allowed to participate regardless of weight.

Neonatal nurses also agreed that kangaroo care increased parental confidence, and 80.6% agreed that kangaroo care should be offered to all parents in the neonatal unit. Sixty neonatal nurses in this study (96.8%) believed that the nurse-parent teamwork required for kangaroo care was worth the effort and 70.9% indicated that they look forward to introducing it to parents. The majority of neonatal nurses, 79% ($n = 49$), agreed that all preterm infants should be allowed to participate in kangaroo care regardless of gestational age. There was also strong support for infants to receive kangaroo care regardless of weight, with 71% of neonatal nurses ($n = 44$) agreeing or strongly agreeing Despite the positive response to kangaroo care regardless of the infants gestation and weight, 58% of neonatal nurses ($n = 36$) agreed or strongly agreed that kangaroo care was not feasible with some patients. Forty-six neonatal nurses (74.2%) believed that intubated infants should be allowed participate in kangaroo care. When presented with the statement that infants with umbilical lines should not be allowed kangaroo care, 17.7% ($n = 11$) agreed or strongly agreed.

Discussion

According to Fulbrook (2003, p.98), "the essence of nursing is in human caring, and the focus of nursing care is on meeting the needs of individual patients". Results indicated nurses' uncertainty regarding kangaroo care with intubated infants, and infants requiring blood pressure support, umbilical lines and phototherapy. All of the above findings indicated that despite research to support the use of kangaroo care for a variety of preterm infants, there still exists some concerns on the suitability and safety of some preterm infants to participate in kangaroo care. The fear of accidental extubation, or arterial or venous line dislodgement appear to be commonly held misconceptions by both healthcare professionals and parents as previously identified by Engler et al. (2002), Franck et al. (2002) and Chia et al. (2006), as they are not grounded in empirical evidence. The WHO practical guidelines on kangaroo care (2003) emphasise that the preterm infant must be classified as stable prior to receiving kangaroo care, and an infant requiring pharmacological support to maintain blood pressure cannot be considered stable. It is this lack of clearly defined criteria for suitability for kangaroo care that appears to contribute to the lack of clarity over the appropriateness of kangaroo care for some preterm infants.

Neonatal nurses agreed on the benefits of kangaroo care in promoting bonding, a finding supported by Nirmala et al. (2006). Forty-nine neonatal nurses (79%) correctly identified that the transfer to the parental chest was the most stressful part of kangaroo care for the preterm infant. compared with only 7% of respondents in the original study by Engler et al. (2002). Although 80.6% of neonatal nurses ($n = 50$) agreed that kangaroo care would improve an infants' outcome, 58% agreed that kangaroo care was not feasible with some patients. This issue ties in with fears about infant suitability previously identified in the knowledge section. These findings are in keeping with other studies on beliefs towards kangaroo care (Engler et al., 2002; Franck et al., 2002; Chia et al., 2006; Mallet et al., 2007). Indeed, Chia et al. (2006) and Engler et al. (2002) indentified that neonatal nurses' beliefs about kangaroo care are more positive in units where it is practiced.

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This may account for over 80% of neonatal nurses disagreeing with the statements that kangaroo care interrupts caregiving, keeps nurses too tied to the bedside, interferes with completion of tasks, modern NICU's are not a suitable place for kangaroo care and that the increased preparation time is not worth the benefits.

Because of these fears, some authors (Ludington-Hoe et al., 2003; WHO, 2003; Chia et al., 2006) advocate guidelines that specify the precautions needed to ensure infants remain stable and to avoid inconsistent practices. The need for a kangaroo care protocol is strongly recommended by the World Health Organization (2003) who state that every health facility that implements kangaroo care should develop a written policy and guidelines that incorporate clear criteria for selection, monitoring and evaluation.

Nurses need to find ways to integrate current research findings into practice (Glacken and Chaney, 2004). Engler et al. (2002) suggested that neonatal nurses needed educational assistance that emphasised the knowledge and skills needed to provide kangaroo care safely and effectively. According to Higgs et al. (2001, p4) "professional practice without underpinning theory is guesswork". No educational program can be effective unless the participants' beliefs regarding kangaroo care are taken into account (Leh, 2007). By identifying staff preconceptions and misconceptions regarding kangaroo care with preterm infants, a change can be brought about in negative beliefs or attitudes towards kangaroo care (Leh, 2007).

Although most of the neonatal nurses are supportive of kangaroo care, none of the respondents in this Irish study had received any formal training or education in kangaroo care. This compares with the respondents in the Chia et al. (2006), where 52.9% had received supervised instruction in kangaroo care techniques and 35.3% had participated in a continuing education program about kangaroo care. DiMenna (2006) believed that increased knowledge of, and education on, kangaroo care for healthcare providers should lead to increased routine use of it as a beneficial intervention. In the research by Chia et al. (2006) and Mallet et al. (2007) respondents viewed staff education as essential in providing them with the knowledge and skill to facilitate kangaroo care and give accurate and supportive information to parents. McCleary and Brown (2003) further enhance this belief with their own theory that individual nurses' research knowledge may not be as important as the process by which organisations implement research in the workplace. Chia et al. (2006) suggested that educational programs on kangaroo care should include skill development, physiological monitoring of infant, and transfer techniques, as this is the most stressful part of kangaroo care for the infant. Chia et al. (2006) also suggested that neonatal nurses should get the opportunity for supervised practice, which correlates with Melnyk et al. (2004).

Yet, promoting kangaroo care is not without practical problems. Despite the benefits that utilising kangaroo care protocols and guidelines, one must remain aware of the limitations of policy implementation. It may not be possible to achieve fully holistic and family centred neonatal care as the infants' clinical condition or staff availability may dictate when kangaroo care can be initiated. Yet, health professionals' support initiating and continuing kangaroo care with parents is vital (Neu, 1999; Franck et al., 2002; Engler et al., 2002, and Chia et al., 2006). Kangaroo care can assist infants and parents adapt to premature delivery, and enhance the neurodevelopmental future of the preterm infant while in the neonatal unit. Using kangaroo care, nurses can facilitate involvement of the parents in as many opportunities as possible to come to know and care for their infant, particularly during long hospitalizations in the neonatal unit.

Conclusion

The aim and objectives of this study were to examine neonatal nurses' knowledge and beliefs regarding kangaroo care in the neonatal unit. This was achieved by employing a quantative descriptive research design. Data collection took place over a one month period and sixty-two neonatal nurses participated in this study by completing a questionnaire. A positive finding was that 90.3% of the neonatal nurses in this sample supported kangaroo care and demonstrated a good level of relevant research knowledge. It is evident from this study that some disagreement persists over the suitability of kangaroo care for certain subgroups of preterm infants. These include intubated infants, infants with umbilical or arterial lines and low birth weight infants. However, the neonatal nurses in this study had more research-supported knowledge as opposed to beliefs. This study indicates the need to implement strategies to overcome such constraints.

Recommendations for clinical practice

- Comprehensive education based on up to date research evidence detailing the benefits and

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risks of kangaroo care could be incorporated into new staff induction, and continuing education days for neonatal and midwifery staff. This will facilitate the development of positive beliefs towards kangaroo care.

- Interactive workshops may increase nurses' knowledge, skills and confidence in the initiation of safe and effective kangaroo care with preterm infants. These should support the neonatal nurse to educate and communicate the benefits of kangaroo care to all parents and other healthcare professionals within the neonatal environment.
- Organisational support is also needed to finance continuing education and to develop practice guidelines and protocols, to ensure the standardisation of information for parents and staff.
- Incorporating interdisciplinary and multi-disciplinary team approaches would augment the implementation of kangaroo care into everyday practice. This in turn can facilitate parents, infants and staff to have a positive kangaroo care experience.

References

Anderson, G., Moore, E., Hepworth, J., Berman, N., 2003a. Early skin-to-skin contact for mothers and their healthy newborn infants. Cochrane Database of Systematic Reviews (Issue 2) Art. No. CD003519.

Anderson, G., Chiu, S., Dombrowski, M., Swinth, J., Albert, J., Wada, N., 2003b. Mother-Newborn contact in a randomized trial of kangaroo (Skin-to-Skin) care. Journal of Obstetric Gynecological and Neonatal Nursing 32 (5), 604–611.

Bauer, K., Pyper, A., Sperling, P., Uhrig, C., Versmold, H., 1998. Effects of gestational and postnatal age on body temperature, oxygen consumption, and activity during early skin-to-skin contact between preterm infants of 25–30 week gestation and their mothers. Pediatric Research 44 (2), 247–251.

Bergman, N., Linley, L., Fawcus, S., 2004. Randomised controlled trial of skin-to-skin contact from birth versus conventional incubator for physiological stabilization in 1200- to 2199-gram newborns. Acta Paediatrica 93, 779–785.

Bohnhorst, B., Heyne, T., Peter, C., Poets, C., 2001. Skin-to-skin (kangaroo) care, respiratory control, and thermoregulation. The Journal of Pediatrics 138 (2), 193–197.

Brown, S., Timmins, F., 2005. An exploration of nurses' knowledge of, and attitudes towards pain recognition and management in neonates. Journal of Neonatal Nursing 11, 65–71.

Burns, N., Grove, S., 2005. The Practice of Nursing Research: Conduct, Critique, and Utilization, fifth ed. Elsevier Saunders, St.Louis. 176–210.

Carfoot, S., Williamson, P., Dickson, R., 2005. A randomised controlled trial in the north of England examining the effects of skin-to-skin care on breastfeeding. Midwifery 21, 71–79.

Cattaneo, A., Davanzo, R., Uxa, F., Tamburlini, G.for the International Network on Kangaroo Mother Care, 1998. Recommendations for the implementation of kangaroo mother care for low birthweight infants. Acta Paediatrica 87 (4), 440–445.

Charpak, N., Ruiz, J., Zupan, J., Cattaneo, A., Figueroa, Z., Tessier, R., Cristo, M., Anderson, G., Ludington, S., Mendoza, S., Mokhachane, M., Worku, B., 2005. Kangaroo mother care: 25 years after. Acta Paediatrica 94, 514–522.

Charpak, N., Ruiz-Pelaez, J., Figueroa de Calume, Z., Charpak, Y., 2001. A randomised controlled trial of kangaroo mother care: results of follow-up at 1 year of corrected age. Pediatrics 108 (5), 1072–1079.

Charpak, N., Figueroa, Z., 2001. Kangaroo Mother Care practical rules.http://kangaroo.javariana.edu.co/sitio_ingles/descargas/kmc_reglas_ingles.doc; (24.11.06).

Charpak, N., Ruiz-Pelaez, J., Figueroa de Calume, Z., Charpak, Y., 1997. Kangaroo mother versus traditional care for newborn infants <2000 grams: a randomised controlled trial. Pediatrics 100 (4), 682–688.

Chia, P., Sellick, K., Gan, S., 2006. The attitudes and practices of neonatal nurses in the use of kangaroo care. Australian Journal of Advanced Nursing 23 (4), 20–27.

Chwo, M., Anderson, G., Good, M., Dowling, D., Shiau, S., Chu, D., 2002. A randomised controlled trial of early kangaroo care for preterm infants: effects on temperature, weight, behaviour and acuity. Journal of Nursing Research 10 (2), 129–141.

Conde-Agudelo, A., Diaz-Rossello, J., Belizan, J., 2003. Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. Cochrane Database of Systematic Reviews(Issue 2) Art. No. CD002771.

DiMenna, L., 2006. Considerations for implementation of a neonatal kangaroo care protocol. Neonatal Network 25 (6), 405–412.

Engler, A., Ludington-Hoe, S., Cusson, R., Adams, R., Bahnsen, M. , Brumbaugh, E., Coates, P., Grieb, J., McHargue, L., Ryan, D., Settle, M., Williams, D., 2002. Kangaroo care. National survey of practice, knowledge, barriers and perceptions. The American Journal of Maternal/Child Nursing 27 (3), 146–153.

Estabrooks, C., Floyd, J., Scott-Findlay, S., O'Leary, K., Gushta, M., 2003. Individual determinants of research utilization: a systematic review. Journal of Advanced Nursing 43 (5), 506–520.

Feldman, R., Eidelman, A., Sirota, L., Weller, A., 2002. Comparison of skin-to-skin (kangaroo) and traditional care: parenting outcomes and preterm infant development. Pediatrics 110 (1), 16–26.

Franck, L., Bernal, H., Gale, G., 2002. Infant holding policies and practices in neonatal units. Neonatal Network 21 (2), 13–20.

Frasure, J., 2008. Analysis of instruments measuring nurses' attitudes towards research utilization: a systematic review. Journal of Advanced Nursing 61 (1), 5–18.

Fulbrook, P., 2003. Developing best practice in critical care nursing: knowledge, evidence and practice. Nursing in Critical Care 8 (3), 96–102.

Gale Roller, C., 2005. Getting to know you: mothers' experiences of kangaroo care. Journal of Obstetric Gynecologic and Neonatal Nursing 34 (2), 210–217.

Glacken, M., Chaney, D., 2004. Perceived barriers and facilitators to implementing research findings in the Irish practice setting. Journal of Clinical Nursing 13, 731–740.

Higgs, J., Titchen, A., Neville, V., 2001. Professional practice and knowledge. In: Higgs, J., Titchen, A. (Eds.), Practice Knowledge and Expertise in the Health Professions. Butterworth Heinemann, Oxford, pp. 3–9.

Jennings, B., Loan, L., 2001. Misconceptions among nurses about evidence-based practice. Journal of Nursing Scholarship 33 (2), 121–127.

Kirsten, G., Bergman, N., Hann, M., 2001. Kangaroo mother care in the nursery. Pediatric Clinics of North America 48 (2), 443–452.

Please cite this article in press as: Flynn, A., Leahy-Warren, P., Neonatal nurses' knowledge and beliefs regarding kangaroo care with preterm infants in an Irish neonatal unit, J. Neonat. Nurs. (2010), doi:10.1016/j.jnn.2010.05.008

Leh, S., 2007. Preconceptions: a concept analysis for nursing. Nursing Forum 42 (3), 109–122.

Ludington-Hoe, S., Johnson, M., Morgan, K., Lewis, T., Gutman, J., Wilson, D., Scher, M., 2006. Neurophysiologic assessment of neonatal sleep organisation: preliminary results of a randomized, controlled trial of skin contact with preterm infants. Pediatrics 117 (5), 909–923.

Ludington-Hoe, S., Anderson, G., Swinth, J., Thompson, C., Hadeed, A., 2004. Randomized controlled trial of kangaroo care: cardiorespiratory and thermal effects on healthy preterm infants. Neonatal Network 23 (3), 39–47.

Ludington-Hoe, S., Ferreira, C., Swinth, J., Ceccardi, J., 2003. Safe criteria and procedure for kangaroo care with intubated preterm infants. Journal of Obstetrics Gynecologic and Neonatal Nursing 32 (5), 579–588.

Mallet, I., Bomy, H., Govaert, N., Goudal, I., Brasme, C., Dubois, A., Boudringhien, S., Pierrat, V., 2007. Skin to skin contact in neonatal care: knowledge and expectations of health professionals in 2 neonatal intensive care units. Archives de Pediatrie 14, 881–886.

McCleary, L., Brown, G., 2003. Barriers to paediatric nurses' research utilisation. Journal of Advanced Nursing 42 (4), 364–372.

McCormack, B., McCance, T., 2006. Development of a framework for person-centred nursing. Journal of Advanced Nursing 56 (5), 472–479.

Melnyk, B., Fineout-Overholt, E., Feinstein, N., Li, H., Wilcox, L., Kraus, R., 2004. Nurses' perceived knowledge, beliefs, skills, and needs regarding evidence-based practice: implications for accelerating the paradigm shift. Worldviews on Evidence-Based Nursing 1 (3), 185–193.

Miles, R., Cowan, F., Glover, V., Stevenson, J., Modi, N., 2005. A controlled trial of skin-to-skin contact in extremely preterm infants. Early Human Development 82, 447–455.

Neu, M., 1999. Parent's perception of skin-to-skin care with their preterm infants requiring assisted ventilation. Journal of Obstetric Gynecologic and Neonatal Nursing 28 (2), 157–164.

Nirmala, P., Rekha, S., Washington, M., 2006. Kangaroo mother care: effect and perception of mothers and health personnel. Journal of Neonatal Nursing 12, 177–184.

Ohgi, S., Fukuda, M., Moriuchi, H., Kusumoto, T., Akiyama, T., Nugent, J., Brazelton, T., Arisawa, K., Takahashi, T., Saitoh, H., 2002. Comparison of kangaroo care and standard care: behavioral organisation, development, and temperament in healthy, low-birth-weight infants through 1 year. Journal of Perinatology 22, 374–379.

Rojas, M., Kaplan, M., Quevedo, M., Sherwonit, E., Foster, L., Ehrenkranz, R., Mayes, L., 2003. Somatic growth of preterm infants during skin-to-skin care versus traditional holding: a randomised controlled trial. Developmental and Behavioral Pediatrics 24 (3), 163–168.

Sontheimer, D., Fischer, C., Buch, K., 2004. Kangaroo transport instead of incubator transport. Pediatrics 113 (4), 920–923.

SPSS, 2006. SPSS Student Version 15.0. Pearson Prentice Hall, Chicago.

Tallandini, M., Scalembra, C., 2006. Kangaroo mother care and mother-premature infant dyadic interaction. Infant Mental Health Journal 27 (3), 251–275.

Tessier, R., Cristo, M., Velez, S., Giron, M., Nadeau, L., Figueroa de Calume, Z., Ruiz-Palaez, J., Charpak, N., 2003. Kangaroo Mother Care: a method for protecting high-risk low-birth-weight and premature infants against developmental delay. Infant Behavior & Development 26, 384–397.

Tessier, R., Cristo, M., Velez, S., Giron, M., Figueroa de Calume, Z., Ruiz-Palaez, J., Charpak, Y., Charpak, N., 1998. Kangaroo mother care and the bonding hypothesis. Pediatrics 102 (2), 17–24.

WHO, 2003. Kangaroo Mother Care: a Practical Guide. WHO, Geneva.

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