THE ATTITUDES AND PRACTICES OF NEONATAL NURSES IN THE USE OF KANGAROO CARE

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ABSTRACT

Objectives:

To survey the attitudes and practices of Australian neonatal nurses in the use of kangaroo care (KC) and identify possible concerns with promoting KC in the neonatal intensive care unit (NICU).

Design:

A two-phase research approach was used that included a descriptive survey followed by in-depth interviews with a subset of survey respondents.

Sample:

Thirty four nurses working in the NICU of a large public hospital in Melbourne completed a survey questionnaire. Four respondents were subsequently selected for follow-up interview to explore in greater depth issues associated with promoting KC in the NICU.

Outcome measures:

Quantitative data were analysed to describe the attitudes, practices and role of the neonatal nurse in promoting KC. Analysis of qualitative responses to survey questions and interviews were coded and major themes identified.

Results:

All neonatal nurses surveyed assisted and encouraged parents to provide KC and the majority agreed on the benefits of KC for both infant and parents. There was a general acceptance that KC can be practiced with low birth weight infants requiring intubation and all but two nurses found facilitating KC professionally satisfying. Results also identified practical concerns with the practice of KC and some uncertainty that KC promotes breastfeeding. Notable constraints to promoting KC in the NICU were heavy staff workloads, insufficient education, lack of organisational support and the absence of clear protocols, especially for low birth weight infants.

Conclusions:

This study confirms neonatal nurses strongly support the use of KC in the NICU. Although the majority of nurses reported positive attitudes and practices, they did identify a number of educational and practical concerns that need to be addressed to ensure KC with low birth weight infants is safe and effective.

INTRODUCTION

Parent-infant attachment is a complex human relationship brought about by physical closeness and early interaction between parents and their newborn (Bialoskurski et al 1999). When an infant is born prematurely the natural bonding process is often hampered, particularly when the infant requires admission to a neonatal intensive care unit (NICU). The NICU is a highly sophisticated environment that provides constant technical support to maintain the physiological status of the neonate. As recipients of complex care, premature infants are necessarily separated from their parents, which can adversely affect the establishment of parent-infant attachment at this critical stage (Bialoskurski et al 1999; Gowan and Nebrig 1997).

Previous research has identified that neonatal nurses tend to focus more on meeting the medical and technological needs of the infant than on building positive interactions between parents and their babies (Fenwick et al 2001a, 1999). Neonatal nurses, however, play a pivotal role in facilitating the attachment process by promoting early parent-infant contact through encouraging parents to touch, hold and care for their infant (Smith 1996) as well as establishing collaborative and positive relationships with the parents (Fenwick et al 2001a, 2001b).

Kangaroo care (KC) involves placing the newborn, clad only in a diaper, prone and upright on the parent's

chest to maximise skin-to-skin proximity (Victor and Persoon 1994). A number of studies have investigated the physiological effects of KC when used with premature infants. Findings have shown that during and after KC the heart rate, respirations and oxygen levels of the neonate remain within normal limits (Messmer et al 1997; Legault and Goulet 1995). KC is also considered a safe practice when used with ventilated (Ludington-Hoe et al 1998; Gale et al 1993) and very low birth weight infants (Bauer et al 1996; Bosques et al 1995).

Positive effects of KC include fewer episodes of idiopathic apnoea (Hadeed et al 1995), improved sleep patterns (Ludington-Hoe et al 1999; Messmer et al 1997) and better thermoregulation (Hadeed et al 1995) for the neonate, enhanced lactation in breastfeeding mothers (Hill et al 1999) and a decrease in maternal depression (Dombrowski et al 2001).

KC is also beneficial for parents of premature infants. A number of studies (Roberts et al 2000; Neu 1999; Smith 1996) have reported skin-to-skin holding provided mothers with a greater sense of wellbeing, personal fulfilment and confidence in taking care of their infant. Likewise fathers, although more reticent than mothers, commented positively on the experience (Moran et al 1999; Neu 1999). However, as noted by Neu (1999) and Moran et al (1999), parents need support from nursing staff to allay their anxiety about handling the infant and to promote confidence in using KC. The types of support found to be beneficial are information on KC and the infant's response to stimulation, verbal encouragement and reassurance, and provision of a private and comfortable environment (Baker 1993). Clearly, the attitudes of neonatal nurses are a major determinant of the degree to which KC is a positive experience for parents.

A review of the literature showed a paucity of information about the attitudes of neonatal nurses towards KC. Although only five articles were located that described the response of nurses to KC (Bell and McGrath 1996; Victor and Persoon 1994; Drosten-Brooks 1993; Gale et al 1993; Hamelin and Ramachandran 1993), the authors concluded that most NICU nurses responded positively and were keen to implement KC in their practice. However, staff resistance was not uncommon (Drosten-Brooks 1993; Gale et al 1993), with some nurses expressing concerns about skin-to-skin holding, especially when it involved very small infants (birth weight less than 1000 grams) and those requiring mechanical ventilation (Bell and McGrath 1996; Gale et al 1993).

Specifically, nurses were apprehensive about the possibility of apnoeic spells and oxygen desaturation, dislodgement of intravenous lines and accidental extubation (Victor and Persoon 1994; Drosten-Brooks 1993; Gale et al 1993). Other factors that may discourage neonatal nurses from recommending KC are insufficient knowledge, lack of clear practice guidelines (Gale et al 1993) and parent anxiety (Affonso et al 1993).

As the infant's primary care provider, neonatal nurses are in a position to either advocate or discourage the use of KC in the NICU. Studies by Fenwick et al (2001a, 2001b, 1999) on the context and nature of interactions between neonatal nurses and parents in Australian level 2 nurseries (special care nurseries) highlighted the need for neonatal nurses to develop quality interactions with parents. Their studies revealed that the attitudes, behaviours and practices of nurses greatly impacted on the woman's experience of mothering in the NICU. Promoting KC is one way neonatal nurses can enhance closeness between parent and infant. To date, no research has systematically examined Australian neonatal nurses' attitudes towards KC. Hence, the purpose of this study was to survey the attitudes and practices of neonatal nurses in the use of KC in the NICU and examine in greater depth, issues and concerns nurses may have in promoting KC in their area of clinical practice.

METHOD

Research design

A two-phased research design was used to obtain both quantitative and qualitative data. The first phase was a descriptive survey of neonatal nurses' attitudes and practices in the use of KC. The second phase involved interviews with a small sample of neonatal nurses to obtain more comprehensive information about issues and concerns relating to KC.

Sample

The study was conducted in a 48-bed NICU of a major teaching hospital in Melbourne, Australia. All registered nurses working in the unit were invited to participate in the study. Of the 91 nurses approached, 34 (37%) agreed to complete the survey and 16 indicated an interest in being interviewed. Of these 16, four were randomly selected for follow-up interview.

Data collection

Survey questionnaire

A self-report questionnaire was designed to obtain demographic data (age, gender, race) and nursing experience (employment status, nursing educational qualifications, years of experience as a nurse, length of experience in neonatal nursing) information, and to assess attitudes and practices relating to KC. Attitudes to KC were measured using a list of 14 statements that reflected the benefits of KC for parents and infants, current practices and the role of the nurse. For each statement, respondents were asked to state their opinion using a 5-point Likert scale ranging from 1=strongly disagree to 5=strongly agree. Closed-ended questions requiring a 'yes' or 'no' were used to ascertain KC practices. The questionnaire concluded with an open-ended question that invited participants to comment on the advantages and disadvantages of KC.

The content validity of the questionnaire was established by an expert panel of four neonatal nurses. The instrument was then pre-tested on a small sample of neonatal nurses (n=5) not included in the study to ensure clarity of instructions and that items were understandable and worded appropriately.

Interview schedule

Four core open-ended questions were devised to encourage participants to describe their perceptions, experiences and views on KC:

- What are your opinions about kangaroo care?
- How do you feel about facilitating kangaroo care?
- What are your experiences in facilitating kangaroo care?
- What assistance or support is needed to facilitate kangaroo care?

Procedure

On receipt of approval from the hospital's Ethics Committee, the survey questionnaire was distributed by internal mail to all registered nurses (excluding staff on leave) working in the NICU. A consent form and a cover letter detailing the study were attached to each questionnaire.

Participants were asked to consent to completing the survey and indicate if they were interested in participating in a follow-up interview. Respondents were instructed to place the completed questionnaire and consent form in the envelope provided and post in the secure box located in the NICU. Returned questionnaires were then coded and data entered on computer for analysis using SPSS for Windows (version 11). Responses to the open-ended question were collated and subjected to a content analysis.

On completion of the survey four participants were randomly selected for a follow-up interview conducted by the researcher at a time and place convenient to the participant. The format of the interview was semi-structured, being guided by the preliminary set of four open-ended questions. Participants were also encouraged to expand on their responses to the questionnaire. Each interview was audio tape-recorded and lasted approximately 30-45 minutes. On completion of the interviews, tapes were transcribed and subjected to content and thematic analysis.

RESULTS

The findings from this study are presented in two parts. Part one reports the results from the survey of neonatal nurses' attitudes and practices in regard to KC, and Part two reports the analysis of responses obtained at follow-up interview.

Survey results

Sample characteristics

The 34 nurses who participated in the survey provided a wide representation of neonatal nurses working in the NICU. All respondents were female with the majority Caucasian (87.5%) and working part-time (84.8%). The mean age of the sample was 39.7 years (SD=7.74, range 25 to 56 years), with an average of 19.5 years of nursing experience and 9.9 years working in neonatal nursing. The basic nursing education qualification held by most nurses was a hospital diploma (61.8%) and undergraduate nursing degree (26.5%). Only seven of the 34 respondents had a postgraduate qualification in neonatal nursing.

Attitudes towards kangaroo care

Response frequencies and mean ratings were calculated for each of the 14 items of the attitude scale. Results are presented firstly for benefits and then for practice/role issues.

Benefits of kangaroo care

Frequencies and mean scores (see table 1) show nurses strongly agreed on the benefits of KC in promoting bonding, enhancing the physical wellbeing of the infant and increasing parents' confidence. Although mean scores indicate a positive response, not all respondents agreed that KC results in more effective breastfeeding, or disagreed with the statement that the benefits of KC are overstated. Of note is that nearly half the respondents were uncertain about the effects of KC on breastfeeding.

Table 1: Frequencies and mean scores for opinions on the benefits of kangaroo care

Item	1 Strongly disagree	2 Disagree	3 Uncertain	4 Agree	5 Strongly agree	M
1. Kangaroo care promotes bonding.	-	-	-	9 (26.5)	25 (73.5)	4.74
2. Kangaroo care has a positive effect on physical wellbeing of infant.	-	-	2 (5.9)	14 (41.2)	18 (52.9)	4.47
3. Kangaroo care enhances the parents' confidence.	-	-	3 (8.8)	12 (35.3)	19 (55.9)	4.47
4. Kangaroo care results in more effective breastfeeding.	-	-	15 (44.1)	8 (23.5)	11 (32.4)	3.88
5. Potential benefits of kangaroo care have been overstated.	5 (14.7)	19 (55.9)	7 (20.6)	3 (8.8)	-	3.76

* reversed scored

Table 2: Frequencies and mean scores on opinions on the benefits of kangaroo care

Item	1 Strongly disagree	2 Disagree	3 Uncertain	4 Agree	5 Strongly agree	M
1. *Kangaroo care should not be practiced with an intubated infant.	13 (38.2)	19 (55.9)	-	2 (5.9)	-	4.26
2. *Kangaroo care should only be practiced for infants weighing 1000 g. or more.	14 (42.4)	15 (45.5)	4 (12.1)	-	-	4.30
3. Kangaroo care should begin within a few hours of birth.	5 (15.6)	9 (28.1)	11 (34.4)	6 (18.8)	1 (3.1)	2.66
4. All parents should be encouraged to practice kangaroo care.	-	2 (5.9)	1 (2.9)	23 (67.6)	8 (23.5)	4.09
5. All parents should be given relevant information on kangaroo care.	-	-	-	15 (44.1)	19 (55.9)	4.53
6. Nurses should remain with parents for support and assistance during Kangaroo care.	-	-	1 (2.9)	14 (41.2)	19 (55.9)	4.56
7. Nurses should facilitate kangaroo care when the NICU is quiet.	2 (5.9)	20 (58.8)	3 (8.8)	6 (17.6)	3 (8.8)	2.65
8. Facilitating kangaroo care is professionally satisfying.	-	1 (2.9)	1 (2.9)	19 (55.9)	13 (38.2)	4.29
9. *Facilitating kangaroo care is an added burden to NICU nurses.	7 (20.6)	17 (50.0)	2 (5.9)	8 (23.5)	-	3.68

* reversed scored

Practice/role issues

Results presented in table 2 show unanimous agreement that parents be informed about KC, and 'very strong' to 'strong' agreement on providing parents with support, assistance and encouragement to practice KC. There was also agreement that KC can be practiced with intubated and low birth weight infants, although most nurses disagreed or were uncertain that KC should begin within a few hours of birth. There was some disagreement that kangaroo care be facilitated only when the unit is quiet. All but two nurses acknowledged that facilitating KC was professionally satisfying. Although most nurses agreed facilitating KC was not an added burden, eight thought otherwise.

Kangaroo care practices and activities

Frequency of 'yes' responses to KC practices and related activities are presented in table 3. Results show all respondents encouraged and assisted both parents to provide KC, particularly for preterm infants with a birth weight of more than 1000 gm, and in the case of mothers, for infants requiring ventilation and those with very low birth weights (less than 1000 gm). Fewer nurses said they assisted parents in providing KC for normal term infants. The majority of nurses (85.3%) provided parents with information on KC. In response to the questions on staff education, half had received supervised instruction on the techniques of KC and a third had participated in a continuing education program.

Responses to the open-ended question inviting nurses to comment further on KC were collated and common themes and issues identified. Results of the content analysis are presented under three headings: advantages, disadvantages and other issues.

Table 3: Kangaroo care practices and activities

Practice	Yes responses N (%)
1. Encouraged mothers in the participation of kangaroo care	34 (100)
2. Assisted mothers in the participation of kangaroo care	34 (100)
• with normal term infants • with preterm infants (>1000 g.)** • with preterm infants (<1000 g.)** • with preterm ventilated infants	21 (61.8) 31 (96.9) 28 (87.5) 33 (97.1)
3. Encouraged fathers in the participation of kangaroo care	33 (97.1)
4. Assisted fathers in the participation of kangaroo care	33 (97.1)
• with normal term infants • with preterm infants (>1000 g.)* • with preterm infants (<1000 g.)* • with preterm ventilated infants	15 (44.1) 30 (90.9) 24 (72.7) 24 (70.6)
5. Provided information about kangaroo care to parents	29 (85.3)
6. Participated in a continuing education program about kangaroo care	12 (35.3)
7. Been supervised in the technique of kangaroo care	18 (52.9)

* 1 missing case ** 2 missing cases

Advantages

Five main themes were identified, four of which reiterate the benefits listed in table 1. The first theme (16

responses) related to the benefits of KC in promoting parent-infant attachment, with comments on maternal feelings of close attachment, love and caring. Several nurses also said it made them feel good as carers. The second theme (10 responses) was how kangaroo care improved parents confidence in handling their infant and participating in routine care. The third theme (8 responses) related to the physical wellbeing of the infant. Several respondents commented that kangaroo care supported the physiological and behavioural status of the infant by keeping the infant warm, maintained infant heart and respiration rate, and promoted sleep. One nurse stated that having close body contact during KC reduced the anxiety infants experienced on being separated from their parents. The fourth theme (6 responses) highlighted that KC was perceived to improve the mother's milk supply and help establish breastfeeding. The fifth theme, which is additional to the benefits noted in the survey, focused on the parents' experience of KC. Comments from six respondents noted that parents found KC enjoyable and satisfying, although two felt that fathers needed additional support and encouragement to overcome the initial fear of holding their tiny infant.

Disadvantages

Comments on the disadvantages of KC were grouped into four themes. The first theme (13 responses) was the time involved in preparing the infant, supporting parents and monitoring the infant's condition during KC. This was considered a major problem during times of staff shortage. The second theme (8 responses) reflected concerns about the NICU environment, such as lack of space and privacy for parents practising KC. The third theme (7 responses) focused on the safety and stability of the infant, with major concerns being dislodgement of equipment (eg. arterial and venous lines, endotracheal tubes) and the infant becoming hypothermic. These issues applied particularly to very small intubated infants. Another difficulty noted by two nurses was parents commenting on not having eye contact with their infant because of the positioning for KC.

Other issues

Respondents identified two additional issues: educating parents and staff education. Four nurses emphasised the importance of providing parents with information about KC, what to expect in terms of infant response, and potential benefits for both parent and infant. Parents also need to know what to wear when providing KC. On the matter of staff education, two nurses stressed the need for in-service training, appropriate support and supervision, and to be aware of the physiological effects of KC on the premature infant.

Analysis of interview responses

The primary purpose of the qualitative interviews was to explore in greater depth issues and concerns nurses may have promoting kangaroo care within the neonatal intensive care setting. Results of the analysis generated three major themes: understanding kangaroo care, practice issues and support needed to facilitate KC.

Understanding kangaroo care

This theme incorporated comments on the nurses' knowledge of KC; the benefits for both parent and infant; and the importance of nurses' attitudes and willingness to promote and facilitate the practice of KC in the NICU. Three of the four respondents said they were knowledgeable about the use of KC and expressed a sense of excitement and enthusiasm about facilitating skin-to-skin holding. As noted by one respondent: *'I find it a great joy when the mums do hold the baby against their chest… irrespective of whether it's a primigravida or a multigravida. You get the same buzz out of it and so do the dads.'*

Practice issues

The focus of this theme was on time implications, the condition of the infant and concerns with dislodgment of equipment. In general comments confirmed the survey findings. All respondents emphasised the time needed to facilitate KC, with one nurse commenting on the time required to explain KC to parents and another emphasising the time needed to prepare the environment. Assistance from another nurse was also required to transfer the infant from the incubator to the parent's chest and to monitor the infant's physiological status during the procedure. According to one interviewee:

'You would probably need… almost an hour I suppose …You'd get the baby up but we make sure it's got a clean nappy and its observations (vital signs) have all been taken… you need to make sure mum is comfortable, find your chairs and pillows and all the bits and pieces and actually get the baby out. You might need a second person to help you with the lines and just rearranging things.'

All respondents expressed a strong sense of frustration with increased workloads and low staffing levels, making it difficult for them to find time to facilitate KC effectively.

The condition of the infant was an area of concern, with a consensus that an infant's tolerance level was a deciding factor in encouraging parents to practice KC. One nurse commented that infants with a low tolerance of handling could desaturate or become bradycardic. Another concern was the danger of dislodging infusion lines and respiratory tubes, although, contrary to survey findings, three respondents felt their experience and education gave them the confidence to deal with this situation. The key was to prevent dislodgement by asking for assistance from another staff member.

Support

Two areas of support were identified. One was the importance of providing support to parents in the form of education and to assist parents' understanding of skin-to-skin holding and what it entails. As one respondent

mentioned: '*it's a parent education thing too…explaining to them what it actually means and how they can go about doing it and how often and how long it does actually take…you need to sort of explain to parents what to wear.*' The other was support for staff in the form of in-service education and the development of practice guidelines.

Respondents viewed staff education as essential in providing them with the knowledge and skill to facilitate skin-to-skin holding. Only then can nurses give accurate and supportive information to parents. As stated by one nurse '*I think they [nurses] need to have a knowledge of it, I think that's fairly important and I am not sure that everybody does have… myself included, I probably need more knowledge…Certainly it needs to be revisited a lot of the time so that the staff can see the importance of it.*' Organisational support is also needed to fund continuing education and to develop practice guidelines and protocols, although opinions on the use of guidelines were mixed. Three respondents said having guidelines would be useful but indicated that some inflexibility could be created.

DISCUSSION

The majority of the neonatal nurses surveyed strongly supported the practise of KC in the NICU. In particular, they acknowledged the benefits of KC in promoting parent-infant attachment, the physical wellbeing of the infant and parental confidence. However, a number of issues were identified in relation to: infant safety; how KC is implemented; practical constraints; and the need for parent and staff education. Survey findings were supported by the qualitative responses.

It is well established that attitudes are a major determinant of behaviour. In this study 'strong' to 'very strong' acknowledgment was given to the benefits of KC in facilitating bonding, enhancing the physical wellbeing of the infant, and increasing parents' confidence in caring for their infant. These results support previous findings reported by Bell and McGrath (1996), and Gale et al (1993), which found most NICU nurses responded positively to skin-to-skin holding and were keen to implement it in their practice. The only area of uncertainty was whether KC is effective in promoting breastfeeding, despite research evidence of a positive relationship between KC and breastfeeding (Hurst et al 1997).

There was strong agreement that: KC is appropriate for intubated and very low birth weight (<1000 g.) infants; staff encourage parents to practice KC; the importance of nurses providing parents with relevant information and being present during KC to offer support. As highlighted by Neu (1999) and Moran et al (1999), support from nurses can allay parent anxiety and promote greater confidence in the use of KC. Parental support typically reported by the nurses was similar to that mentioned by Baker (1993): parent education, verbal encouragement and providing a conducive environment for kangaroo care. Affonso et al (1992) also emphasised the need for nurses to evaluate parental responses during KC and provide support and assistance as required.

Another aspect that received strong agreement was that promoting KC is professionally satisfying: a key factor in developing a positive attitude. The only area of uncertainty or low agreement was that KC begins within a few hours of birth. This could be because some infants on admission to the NICU may not be stable enough to tolerate KC. That positive attitudes of neonatal nurses influenced their behaviour is clearly reflected in the survey of practices and activities. All but a few nurses encouraged and assisted both mothers and fathers to practice KC with pre-term infants, irrespective of birth weight and whether the infant was intubated or not. The majority of nurses also provided parents with information on KC.

Including a qualitative component to the study in the form of open ended questions and interviews served to validate survey responses and identify concerns and issues associated with practicing KC in the NICU. One particular concern expressed by respondents was the safety of the infant during KC. In accord with previous studies (Bauer et al 1996; Bosque et al 1995; Legault and Goulet 1995), there was general agreement that KC had no adverse effects on the physiological status of the infant. Some nurses, however, were worried the infant may become hypothermic, that venous and arterial lines may be dislodged, or accidental extubation could occur during transfer.

Nurses in this study also recognised that some infants may not be stable enough to tolerate handling during KC, particularly infants weighing less than 700 grams and requiring mechanical ventilation. It is because of these concerns that some authors (Bell and McGrath 1996; Gale et al 1993) advocate guidelines that specify the precautions needed to ensure the infant remains stable and to avoid inconsistent practices. These guidelines should include criteria for selecting infants for KC, preparation of the environment, the procedure for transferring the infant from incubator to parent, and monitoring the infant's physiological status during and after the procedure. Moreover, several nurses considered it important protocols remain flexible so as not to restrict the practice of KC. As suggested by Ludington-Hoe et al (1994), consultation with medical staff may be needed in determining the eligibility of infants for KC.

Promoting KC in the NICU is not without practical problems, particularly providing a suitable environment and dealing with time constraints. As noted by Gale and Franck (1998), the NICU environment often limits the parent's ability to care for their infant and to practice KC. Most of the available space is taken up with high technology equipment: a barrier which some believe can directly affect the parent-infant attachment process (Gale and Franck 1998; Walker 1998).

The NICU is also a very noisy and busy place, making it difficult to offer parents the quiet, private and relaxing environment they need to effectively implement KC. The other major barrier identified by respondents was insufficient time to adequately prepare the infant for KC and provide support to parents. This was particularly problematic when the unit was busy or short staffed. However, there is some evidence that the beneficial effects of KC, such as the settling effect on the infant and greater involvement of parents in providing care, can result in less workload for the staff (Ludington-Hoe et al 1994).

Several authors emphasised the importance of staff education in promoting and facilitating KC (Bell and McGrath 1996; Victor and Persoon 1994; Drosten-Brooks 1993). This applies particularly for new staff. Although most nurses were aware of the benefits of KC, only half had been supervised in the technique and a third had not participated in an education program related to KC. The need for in-service education to provide neonatal nurses with up-to-date information on the efficacy and beneficial effects of KC for infant and parents was apparent.

Education programs should include skill development components, especially how to monitor the infant's physiological status and techniques in infant transfer, and the opportunity for supervised practice. Being fully informed of the practice of KC enables neonatal nurses to give accurate and supportive information to parents and help overcome any reservations they may have about KC.

LIMITATIONS

A notable limitation of this study was the low response rate and a relatively small sample of nurses recruited from the NICU of only one hospital. Thus caution is needed when interpreting and generalising the findings. Clearly, a more extensive survey of neonatal nurses is needed to confirm findings from this study. However, results do highlight some important clinical issues and the need for staff education that will encourage nurses to routinely promote KC to enhance parent-infant attachment and increase parental involvement in the care for their infants.

CONCLUDING COMMENTS

Infants admitted to a NICU require complex medical treatment and care. Because of the intensity of care these infants are deprived of personal contact at a time critical for the development of a close infant-parent relationship. This study highlights the use of KC as a means of facilitating parent-infant attachment, and provides valuable insights into the attitudes and practices of neonatal nurses in promoting KC within the highly specialised NICU environment. The study also indicates the need to implement strategies to overcome practical constraints that have been identified by a group of neonatal nurses highly committed to promoting KC.

REFERENCES

Affonso, D.D., Bosque, E., Wahlberg V. and Brady J.P. 1993. Reconciliation and healing for mothers through skin-to-skin contact provided in an American tertiary level intensive care nursery. *Neonatal Network.* 12(3): 25-32.

Affonso, D.D., Hurst, I., Mayberry L.J., Haller, L.,Yost, K. and Lynch, M.E. 1992. Stressors reported by mothers of hospitalised premature infants. *Neonatal Network.* 11(6): 63-70.

Baker, A.M. 1993. Maternal perceptions of the kangaroo care experience. Unpublished master's thesis, The College of St. Catherine, St. Paul, Minnesota, USA.

Bauer, J., Sontheimer, D., Fischer, C. and Linderkamp, O. 1996. Metabolic rate and energy balance in very low birth weight infants during kangaroo holding by their mothers and fathers. *The Journal of Pediatrics.* 129(4): 608-611.

Bell, R.P. and McGrath, J.M. 1996. Implementing a research-based kangaroo care program in the NICU. *Nursing Clinics of North America.* 31(2): 387-403.

Bialoskurski, M., Cox, C.L. and Hayes, J.A. 1999. The nature of attachment in a neonatal intensive care. *Journal of Perinatal Neonatal Nursing.* 13(1): 66-77.

Bosque, E.M., Brady, J.P., Affonso, D.D. and Wahlberg, V. 1995. Physiologic measures of kangaroo versus incubator care in a tertiary-level nursery. *Journal of Obstetric, Gynecologic, and Neonatal Nursing.* 24(3): 219-226.

Dombrowski, M.A.S., Anderson, G.C., Sanfori, C. and Burkhammer, M. 2001. Kangaroo (skin-to-skin) care with a postpartum woman who felt depressed. *American Journal of Maternal Child Nursing.* 26(4): 214-216.

Drosten-Brooks, F. 1993. Kangaroo care: skin-to-skin contact in the NICU. *American Journal of Maternal Child Nursing.* 18(5): 250-253.

Fenwick, J., Barclay, L. and Schmied, V. 1999. Activities and interactions in level 2 nurseries: a report of an ethnographic study. *Journal of Perinatal and Neonatal Nursing.* 13(1): 53-65.

Fenwick, J., Barclay, L. and Schmied, V. 2001a. Struggling to mother: a consequence of inhibitive nursing interactions in the neonatal nursery. *Journal of Perinatal and Neonatal Nursing.* 15(2): 49-64.

Fenwick, J., Barclay, L. and Schmied, V. 2001b. 'Chatting': an important clinical tool in facilitating mothering in neonatal nurseries. *Journal of Advanced Nursing.* 33(5): 583-593.

Gale, G. and Franck, L.S. 1998. Neonataology: toward a standard of care for parents of infants in the neonatal intensive care unit. *Critical Care Nurse.* 18(5): 62-74.

Gale, G., Franck, L. and Lund, C. 1993. Skin-to-skin (kangaroo) holding of the intubated premature infant. *Neonatal Network.* 12(6): 49-57.

Gowan, J.W. and Nebrig, J.B. 1997. Infant-mother attachment at risk: how early intervention can help. *Infants and Young Children.* 9(4): 62-78.

Hadeed, A.J., Ludington, S.M. and Siegal, C. 1995. Skin-to-skin contact between mother and infant reduces ideopathic apnea of prematurity. *Pediatric Research.* 37(4): 173A.

Hamelin, K. and Ramachandran, C. 1993. Kangaroo care. *The Canadian Nurse.* 89(6): 15-17.

Hill, P.D., Aldag, J.C. and Chatterton, R.T. 1999. Breastfeeding experience and milk weight in lactating mothers pumping for preterm infants. *Birth.* 26(4): 233-238.

Hurst, N.M., Valentine, C.J., Renfro, L., Burns, P. and Ferlic, L. 1997. Skin-to-skin holding in the neonatal intensive care unit influences maternal milk volume. *Journal of Perinatology.* 17(3): 213-217.

Legault, M. and Goulet, C. 1995. Comparison of kangaroo care and traditional methods of removing preterm infants from incubators. *Journal of Obstetric, Gynecologic, and Neonatal Nursing.* 24(6): 501-506.

Ludington-Hoe, S.M., Anderson, G.C., Simpson, S., Hollingsead, A., Argote, L.A. and Rey, H. 1999. Birth-related fatigue in 34-36 week preterm neonates: rapid recovery with very early kangaroo (skin-to-skin) care. *Journal of Obstetric, Gynecologic, and Neonatal Nursing.* 28(1): 94-103.

Ludington-Hoe, S.M., Ferreira, C.N. and Goldstein, M.R. 1998. Kangaroo care with a ventilated preterm infant. *Acta Paediatrica.* 87(6): 711-713.

Ludington-Hoe, S.M., Thompson, C., Swinth, J., Hadeed, A.J. and Anderson, G.C. 1994. Kangaroo care: research results, and practice implications and guidelines. *Neonatal Network.* 13(1): 19-27.

Messmer, P.R., Rodriguez, S., Adams, J., Wells, J., Washburn, I., Zabaleta, I. and Abreu, S. 1997. Effect of kangaroo care on sleep time for neonates. *Pediatric Nursing.* 23(4): 408-414.

Moran, M., Radzyminski, S.G., Higgins, K.R., Dowling, D.A., Miller, M.J. and Anderson, G.C. 1999. Maternal kangaroo (skin-to-skin) care in the NICU beginning 4 hours postbirth. *The American Journal of Maternal Child Nursing.* 24(2): 74-79.

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.

Roberts, K.L., Paynter, C. and McEwan, B. 2000. A comparison of kangaroo mother care and conventional cuddling care. *Neonatal Network.* 19(4): 31-35.

Smith, K. 1996. Skin-to-skin contact for premature and sick infants and their mothers. In Biley, F. and Maggs, C. (eds). *Contemporary Issues in Nursing 1* New York: Churchill Livingstone. pp.31-78.

Victor, L. and Persoon, J. 1994. Implementation of kangaroo care: a parent-health care team approach to practice change. *Critical Care Nursing Clinics of North America.* 6(4): 891-895.

Walker, S.B. 1998. Neonatal nurses' views on the barriers to parenting in the intensive care nursery – a national study. *Australian Critical Care.* 11(3): 86-91.