The role of the neonatal nurse in promoting parental attachment in the NICU

Neonatal nurses need to have a knowledge of attachment in order to facilitate this process in the neonatal intensive care unit (NICU), and participate in family-centred care. This article reviews the evidence from nine research papers, examining how attachment is affected in NICU, and specific methods of how it can be facilitated through positive touch and communication techniques.

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Key points

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1. The NICU environment can have adverse effects on the attachment process between parents and their infants.
2. Neonatal nurses have the ability to facilitate or impede the attachment process through the quailty of their care.
3. Positive touch, or skin-to-skin contact, and the use of therapeutic communication has the potential to enhance attachment.
4. Further research is required in relation to paternal attachment, particularly as fathers of premature infants have been found to have different needs to mothers.

It has been identified in the literature that neonatal nurses often have the propensity to focus on meeting the medical and technological needs of the infant rather than involving themselves in building relationships between parents and their children[1]. The importance of the bond between a child and their parents is recognised in the National Service Framework for Children, Young People and Maternity Services[2] and so neonatal nurses, as primary care providers, must have an understanding of how to promote parental attachment in NICU in order to comply with family-centred care philosophy. This review will present the evidence currently available from both qualitative and quantitative studies in order to compare findings from the last 10 years.

The quality of the studies reviewed was assessed using the Critical Appraisal Skills Programme[3] and critiqued using Polit, Beck and Hungler's framework[4].

Effect of NICU on the attachment process

The NICU is a complex, structured and highly technological environment, which has been found to impede meaningful and positive parent-infant interactions[5,6]. Although studies have explored this phenomenon over the last 30 years, the NICU environment has advanced technologically, and it is important to examine this issue further with the use of current research within the last 10 years.

Three studies were identified and critiqued. Bialoskurski et al[7] working in the UK and Wigert et al[8] in Scandinavia, employed a qualitative, inductive approach in developing an in-depth understanding of mothers' experiences. Bialoskurski et al[7]achieved this through a combination of unstructured interviews, field notes and observational memos; while Wigert et al[8] undertook a hermeneutic phenomenological approach through video-taping open interviews with 10 mothers six months to six years after their experience in NICU.

In contrast, Schmücker et al[9] used a quasi-experimental approach in their German study. They investigated longitudinally how mother-infant interactions were affected in the first two years after the birth of a very low birthweight baby and also the impact of the infant's neurobiological risk and maternal anxiety, on their interactions using an intervention component. This enabled the topic to be investigated from a more scientific perspective and allowed a direct insight into the infants' responses.

Wigert et al[8] conducted an extensive literature review in relation to mothers' experiences after six months to explore the lasting effects of NICU. However, exclusion criteria for the study included infants born at less than 37 weeks' gestation and those with deformities; excluding its relevance to a large percentage of the target population of infants in NICU. In comparison, Schmücker et al[9] and Bialoskurski et al[7] included participants whose infants were either of very low birthweight or had complex medical problems, thus exploring a broader picture of the phenomenon.

Wigert et al[8] and Bialoskurski et al[7] used the theoretical frameworks which had guided the rest of their studies to carry out the analysis of their data, demonstrating consistency and allowing an effective comparison with established theories[11]. To increase validity, while also establishing rigour and trustworthiness, data was analysed by two or more researchers. A constant comparative analysis was used for both qualitative studies, until theoretical saturation had been achieved. However, Bialoskurski et al (1999) further increased the validity of their study by asking mothers to confirm all interview data as accurate representations of their experiences.

In their quantitative design, Schmücker et al[9] used three trained raters to assess mother-infant interactions and achieved an acceptable interrater reliability of $K \geq 0.80$. The authors, however, acknowledged a difficulty in measuring preterm facial expression, which could have resulted in lower interrater reliability. In measuring the mothers' levels of anxiety, confounding variables, such as psychosocial risk and birth order, were taken into account in order to ensure a greater level of internal validity[4]. The analysis revealed that the lower the gestational age of the infant, the higher the anxiety of the mother (Spearman's $\rho=0.26$, $p=0.03$, $n=74$). Mothers also rated themselves more anxious as the infant's neurobiological risk increased. Results indicate a relationship between mothers who suffered from high anxiety and children who are less facially responsive; Pearson $r=-0.372$, $p=0.001$; $n=74$, which correlates with the hypotheses.

The results from the studies discussed have identified that NICU can have a negative effect on the attachment process between the mother and their infant. Factors which can lead to disruption of the attachment process include the separation of parents from their child[7,8], and high levels of maternal anxiety, as experienced in NICU[9]. The neurobiological risk of the infant in the first weeks of life also had a negative influence on the mother-infant interaction, which indicates that much of the UK NICU population are at risk from an impaired attachment with their mother.

The studies reviewed expose the pivotal role of the nurse in affecting the process of attachment in NICU. The formation of an attachment bond may not be automatic, as previously theorised[12], but should instead be treated as an individualised process[7]; often dependent on the health status of the infant and the mother, environmental circumstances, and on the quality of nursing care. Likewise, Wigert et al[8] noted that the maternal sense of attachment was affected by feelings of participation or exclusion, as dictated by nursing staff. These findings are supported by Holditch-Davis and Miles[13].

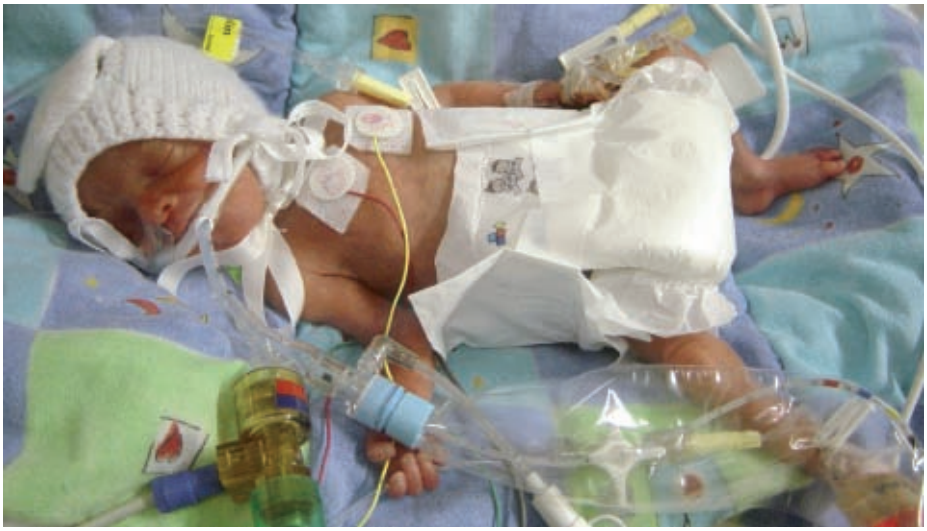

FIGURE 1 The technological environment of the NICU may have a negative effect on the interaction between mother and baby. *Photo courtesy of Marc Hardenberg.*

While Schmücker et al's[9] findings suggest a reduction of maternal anxiety over time, as supported by Carter et al[14], Wigert et al[8] suggest that the experience of having a child cared for in NICU (**FIGURE 1**), still affects the mother even six years after the birth of the child. This discrepancy may demonstrate the individualism of parental responses to stress, and the importance of assessing the family according to their individual needs. The methods used to promote this process have been researched, and are described below.

The influence of positive touch

The importance of early social interactions between infants and their caregivers, such as holding, touching, and eye contact have been well researched in relation to attachment[5,15,16]. In the NICU environment this is severely compromised[10]; and while there are many studies which address the physiological benefits of positive touch, there are few which have addressed the psychological benefits[17]. In the past, it was believed to be more beneficial for preterm infants to be left undisturbed because they were over stimulated in the NICU[18]. However, more recent studies have shown touch to be beneficial[19]. These conflicting findings highlight the need to explore this phenomenon further to see if there are benefits to positive touch, as many studies have hypothesised.

Two quantitative studies[20,21] and one qualitative study[22] were critiqued in order to investigate the use of positive touch. The study by Weiss et al[20] intended to explore through a descriptive correlational design, the extent to which maternal touch may be associated with a low birthweight infant's sense of attachment. Miles et al[21] aimed to investigate, through the use of a prospective controlled trial, the directional hypothesis that mother-infant skin-to-skin contact improves preterm infant behavioural and neurological outcomes, as well as increasing lactation, improving maternal care-giving confidence and enhancing mental health and parenting skills. In contrast, Johnson[22] employed a qualitative, inductive study; examining the data for patterns and relationships through describing the experience of kangaroo holding in the NICU environment from a maternal perspective.

The strength of the study by Johnson[22] lies in the quality of the interview. The questions in the interview were determined by a panel of three expert nurses, who had knowledge of this topic. They are pertinent and open-ended, allowing the respondent to answer in depth. However, mothers were interviewed and observed on only one occasion in Johnson's[22] qualitative study, which may not be representative of their overall experiences. In contrast Weiss et al[20] collected data at four different points within the infant's first year and Miles et al[21] collected data at three different points within the child's first year. This design enhances the interpretability of the results

and allows the data to be compared over time. The first year of life is also an important stage of the attachment process[23], so data collection in this time scale is relevant.

Miles et al[21] used a control group which underwent the intervention of similar holding techniques for the infant. This included positioning the mother at a 60° angle and the child only wearing a nappy and hat. The rationale for this particular intervention was not supported by relevant literature, which is essential in assessing the validity of the findings[24]. There is also no description of the touch the non-control group received; a vital component in making accurate comparisons and analysing the results effectively[24].

The results in the study by Weiss et al[20], analysed by analysis of covariance, demonstrated that nurturing touch was the only independent variable which showed any significant relationship to infant security of attachment. Weiss et al used correlation coefficient results to show that mothers who used extensive amounts of nurturing touch had significantly higher scores for their security of attachment (M=0.78), than mothers who used a moderate (M=0.67), or minimal amount of nurturing touch (M=0.63).

Weiss et al[20] and Johnson[22] obtained findings which suggested that positive touch has a beneficial effect on attachment, which is supported by studies by Neu[25,26] and Feldman et al[19]. In contrast Miles et al[21] found no significant statistical difference in any infant or maternal measure. Parametric and non-parametric data analysis were conducted on individual outcomes. Correlations were also calculated for the control group, and Bonferroni corrections were applied to these comparisons. However, although this suggests a thorough statistical analysis, the results should be treated with extreme caution as the methodology lacked rigor, as discussed above.

Miles et al[21] suggested that their findings may be due to the low gestational age of the infants (a mean age of 28 weeks' gestation), who perhaps do not respond to kangaroo care. This is possible according to Weiss et al[20]. Although Weiss et al's sample included infants with a mean gestational age of 32 weeks, they concluded that infants who were more vulnerable based on medical complications, diminished responsiveness and very low birthweight appear to be at greater risk for attachment problems, with the potential for exacerbation of these problems from the use of extensive nurturing touch.

FIGURE 2 Positive touch can help to promote attachment between infants and their parents.

This literature review has revealed that maternal touch has the potential to play a significant role for low birthweight infants in their development of a secure attachment[20,22]. While kissing, hugging and caressing have been associated with attachment outcomes for both mothers and infants[20], mothers specifically have also expressed the feeling of intenseness and 'connectedness' through kangaroo holding[22]. Behavioural observations reinforce these findings; acknowledging that mothers notice behavioural cues and intervene to comfort their infant appropriately when undertaking skin-to-skin holding[22]. Skin-to-skin contact is also supported by BLISS[27], as a method of increasing attachment between mother and baby.

Although the research conducted by Miles et al[21] did not demonstrate any benefit of skin-to-skin contact, and was unable to replicate findings from previous research[19,28-30], the findings did not suggest that positive touch causes harm to neonates (**FIGURE 2**). There were, however, clear limitations to Miles et al's[21] study, as discussed, therefore their findings must be treated with caution.

Communication skills

Effective communication between nurses and parents is an essential element of supportive care and in family-centred care philosophy, and has been found to reduce parental stress; yet it may be problematic within the NICU environment[31,32]. Studies have previously demonstrated the link between a reduction of parental stress and attachment[33,34].

The three studies reviewed here aimed to examine parental perceptions of communication with nurses in the NICU environment. Bialoskurski and Cox[35] began their research by collecting qualitative data through observational methods, individual unstructured interviews and focus group discussions. They then collected quantitative data through the use of surveys based on the Critical Care Family Needs Inventory (Leske[36]) in an attempt to quantify and validate family members' needs.

In contrast, Jones et al[37] conducted interviews as their sole method of data collection. The semi-structured approach they employed, used guided questions which enabled the research to become focused, and complied with the Communication Accommodation Theory (CAT)[38] framework, allowing an explanation of communicative behaviour and the motivations behind it. This incorporated elements of quantitative and qualitative research, as the semi-structured interview provided structure while allowing the researcher to probe more deeply for answers but was restricted to seeking clarification and was therefore limited in uncovering new perspectives.

The interviews in the three studies were recorded and transcribed verbatim. However, some interviews conducted by Fenwick et al[39] were done face-to-face, and some over the phone. This may have decreased the reliability of the study, as research has since shown that telephone respondents have been found to be less cooperative and engaged in the interview[40]. As well as unstructured interviews, Fenwick et al[39] triangulated their methods by audio taping 'cot side' interactions between parents and nurses. Observations and informal conversations with families and nurses were recorded in field notes. These observations were based on a conceptual framework involving previously established research.

Once Jones et al[37] had explored their research question inductively, they analysed their interviews quantitatively using content analysis based on CAT[38] and previous studies to enhance validity and reduce bias. The interview data was coded and 30% of the data was coded by a second coder providing an acceptable interrater reliability of 0.82 using Cohen's kapper.

Although the use of quantitative data analysis in this way may help to contribute to an understanding of the phenomena, it is important to acknowledge that Jones et al's[37] findings lack generalisability. This is

due to a lack of rigor in the design; for example the sample size was small and limited to one site and therefore it is questionable whether this sample was representative of the target population.

Fenwick et al[39] analysed their data in accordance with the concept of grounded theory. Content analysis revealed that the nurse's use of language was a powerful tool in providing care and in the facilitation of maternal feelings. Quotations from participants are provided in the text, allowing the reader to scrutinise the interpretation of the findings.

All three studies[35,37,39] identified the importance of communication in building relationships with parents. Specifically, both Bialoskurski and Cox and Fenwick et al identified that the attachment process can be facilitated through the use of appropriate communication between the nurse and mother. Methods of positive communication as described by mothers, included chatting; talking about general issues apart from the infant, and nurses asking questions and encouraging parents to ask questions in return[37,39]. Nurses who employed the use of emotional expression, whereby they were caring or reassuring, who showed warmth and empathy, were most able to build supportive relationships with mothers and encourage attachment with their infants[39].

One of the main themes threaded throughout these studies was the importance of accurate information regarding the infant's care and health status[35,37,39]. Interestingly, this appears to be particularly important to fathers, whereas mothers may appreciate a more social relationship with their nurse[37]. The significance of accurate information is highlighted by research which has shown that parents who understand their infant's competence and needs have been found to be more able to interact with their child[10]; providing the potential to solidify the attachment process[41].

In establishing a supportive relationship with parents, children's nurses should aim to develop a symmetrical relationship with an equal balance of power between the mother and nurse[35,37,39]. An asymmetrical relationship where the nurse is perceived as being in a position of power and control, has the potential to create a psychological barrier between the mother and nurse, which hinders communication and in turn attachment between the mother and infant[35].

Implications for future practice and research

Crucially, the findings by Bialoskurski et al[7] indicate that the attachment process may not be automatic. This justifies the need for an intervention into its facilitation. As the common theme throughout every article critiqued was the power of the neonatal nurse in either promoting or hindering the attachment process, it is essential for nurses to be aware of their role. This concept is reflected in The National Service Framework for the Mental Health and Psychological Well-Being of Children and Young People[42], which recognises the importance of early attachment and bonding between parents and their babies, and the need for this process to be supported by healthcare professionals.

Specifically, Bialoskurski et al[7] found that the presence of a technological environment delayed attachment, along with the unexpected appearance of a premature infant; and while this is a more difficult aspect of care to change due to the necessity of equipment, the experience may be improved by preparing the parents through visiting the NICU prior to birth if possible and explaining expected outcomes[43]. This may reduce the level of maternal anxiety found to impede attachment[9]. The therapeutic use of communication in this instance may assist in attachment. The provision of accurate information is recognised as an essential element of nursing care[42,44], and particularly within NICU, as highlighted by Bliss[27] who state that it is vital for parents to be kept well informed and updated, so they are involved from the earliest stages of the child's life and can start caring for them.

Jones et al[37] suggest the use of additional training in communication skills for neonatal nurses in order to develop the skills that parents find effective and also to increase awareness of the behaviours those parents find most ineffective. This has occurred in other critical healthcare areas in the UK, such as oncology, where there has been a national push for advanced therapeutic communication skills training for senior healthcare practitioners[45], indicating that this may be a viable recommendation.

Findings from the papers reviewed suggest that the nurse is able to provide a pivotal role in facilitating attachment from the maternal perspective[22], and also from

FIGURE 3 Kangaroo care promotes bonding.

the infant's perspective[20], in encouraging skin-to-skin holding (**FIGURE 3**). Johnson[22] describes the nurse's crucial role in guiding the kangaroo experience, and helping to prepare a quiet space for this to take place effectively. The World Health Organisation[46] acknowledges and supports this idea through the publication of a guide for health professionals on kangaroo holding. It is also promoted by charities such as BLISS[22], who acknowledge its importance in assisting attachment. However, Miles et al[21] expose the need for further research to explore the effects of skin-to-skin holding on infants with a gestational age below 31 weeks, in order to assess whether it is beneficial for this age group.

The literature search highlighted the need for more research on this topic that is based in the UK, in order to confidently generalise the results. The role of fathers in contributing to their child's health and well-being is also often overlooked[42,47], but they can have an important function, as fathers who have a close and satisfying relationship with their infant have a positive influence on maternal attachment behaviours[41]. In this literature review, the only study which explored a paternal perspective was performed by Jones et al[37], which reflects those found in the literature search; suggesting the need for further research in this area, particularly as Jones et al[36] discovered that fathers have quite different needs from mothers, as supported by Fegran et al[47] and Moehn and Rossetti[6].

The reason for a maternal focus may lie in the belief that children are influenced almost exclusively by the organisation of their attachment to the mother[48]. However, the National Service Framework for Children, Young People and Maternity Services[2], supports a cultural shift in all service provisions, to include fathers in all aspects of a child's well-being; highlighting the continual need for research in the changing demands of healthcare.

Conclusion

It is evident that neonatal nurses are in a unique position to help parents deal with their stress in the NICU and to facilitate a relationship with their child. However, if the quality of nursing care does not meet the individual needs of the parents, this can be detrimental to the formation of attachment[6,7,39]; demonstrating the importance of knowledge and understanding in order to be adaptable and achieve a positive outcome in relation to attachment.

The evidence suggests that positive touch, in the form of skin-to-skin contact, and the use of therapeutic communication, whereby the nurse allows the formation of a symmetrical relationship with the parents and a consistent flow of accurate information, may assist in the formation of attachment. With the appropriate support and education, neonatal nurses are able to play a role in effectively strengthening the bond between a neonate and their parents, thereby contributing to the well-being of the child and cohering with the empowerment of family-centred care philosophy[49].

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