

# Parent simulation education – early implementation on the NICU

Introducing practices and facilities that encourage and support families to actively care for their infants while on a neonatal intensive care unit (NICU) is essential in providing effective family-integrated care. In this article we describe the design, implementation and evaluation of a parent simulation teaching programme to improve parental confidence in caring for their infant within the first two weeks of their admission to the NICU.

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## Keywords

neonatal; parent education; simulation; family-integrated care

## Key points

**Williamson S.L., Stockley E.L., Cawsey E.E., Raiman C., Johnson S., Holder G.** Parent simulation education – early implementation on the NICU. *Infant* 2021; 17(3): 128-30.

1. Supporting families to provide active care for their infants from the time of admission to the NICU is important.
2. The implementation of a parent simulation programme following admission to our NICU, was shown to improve parental confidence in caring for their baby.

Family-integrated care (FIC) is a model of care which aims to integrate the family into the team caring for their baby.<sup>1</sup> It is increasingly being considered best practice when delivering neonatal care.<sup>2</sup> Educational programmes for families are one of the four key pillars of FIC.<sup>3</sup>

A parent simulation programme uses simulation as an educational tool for families allowing skills to be taught in the context of a safe environment. Simulation has been incorporated into teaching at discharge from the NICU, teaching parents' skills, for example basic life support.<sup>4</sup> Our aim was to evaluate a parent simulation programme designed and implemented on our NICU at the beginning of the neonatal journey and its effects on confidence among the families.

## Methods

Families of infants born at less than 31 weeks gestational age admitted between 7 April and 7 August 2019 to the NICU at Birmingham Women's Hospital were invited to attend a parent simulation programme. Eligible families were identified within the first two weeks of their infant's admission and were provided with verbal and written information.

The programme was intended to support informal cot-side teaching provided by neonatal staff from the point of admission by allowing families to experience taking care of an infant in a safe but realistic environment. It was led by a multidisciplinary faculty, including senior neonatal trainees, nurses and a physiotherapist. The programme was conducted in a simulation room on the NICU. It included an incubator, a monitor

(Philips), infusion pumps and ventilatory support. Low fidelity preterm manikins (Laerdal Preterm Anne task trainer) were used. Each manikin was adapted to represent the level of clinical support required, for example the presence of an endotracheal tube, nasal continuous positive airway pressure (nCPAP) mask or high flow nasal cannula, as well as central venous and arterial catheters.

The programme consisted of four sessions incorporating simulation-based education alongside traditional teaching methods, each lasting approximately 30 minutes. In session 1, families were taught how to recognise and interpret behavioural cues commonly seen in preterm infants. Simulation enabled parents to learn how to respond to these cues using techniques such as containment holding. Session 2 taught families common care skills including nappy changes, washing and drying, temperature taking and re-siting a saturation probe (**FIGURE 1**). In session 3, families were provided with information on feeding, as well as taught how to give a naso/orogastric feed. In session 4, the benefits and common anxieties of kangaroo care were discussed and simulated (**FIGURE 2**). In all sessions, families were given the opportunity to use the manikin. Feedback questionnaires were distributed after each session. Families were asked to rate their confidence before and after the session, as well as evaluating its usefulness using a Likert scale (1 = not at all confident/useful, to 5 = extremely confident/useful). Thematic analysis using Braun and Clarke's six-phase technique was used for parental comments.



**FIGURE 1** Session 2: Performing common care skills in a simulated environment.



**FIGURE 2** Session 4: Kangaroo care.

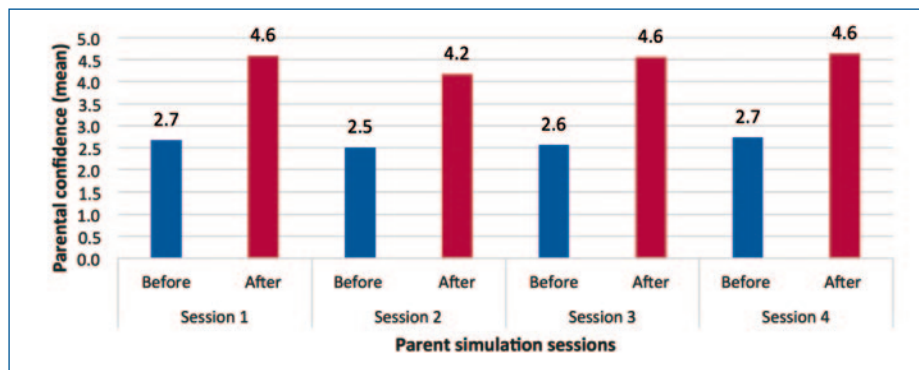
## Results

Forty-one families had 49 infants born at less than 31 weeks gestational age, admitted to the NICU from April 7 to August 7 2019. Of these, 23 families of 28 infants participated in the programme. Fifteen families attended session 1, 12 families attended session 2 and 4, and nine attended session 3. All families attended their first session within the first two weeks of their admission.

Feedback questionnaires were completed by 92% of families. Overall evaluation was positive and demonstrated the programme was well received. All families (100%) reported their session very useful. The majority reported an improvement in self-confidence (**TABLE 1**).

Analysis of the families' comments identified five key themes:

- 1. Parental knowledge:** Statements supporting this theme, 'more understanding on how to care for my baby' and 'learnt what to expect'
- 2. Parental confidence:** Comments were consistent with improved self-confidence scores. 'Before the session I wouldn't do cares alone, but now I feel I could do the cares by myself with supervision'. 'The



**TABLE 1** Parental confidence before and after each session. Scale: 5=extremely confident; 4=confident; 3=neither confident or not confident; 2=not confident; 1=not at all confident.

*session covers all the learning tools you need to feel confident'*

- 3. Teaching methods:** Demonstrations using a manikin 'made it easier to visualise and understand' and that it was 'good to have the opportunity to practice on a simulation doll'
- 4. Faculty:** Feedback of the faculty 'professional advice and information', 'friendly and approachable,' and 'supported and knowing we can ask lots of questions'
- 5. Timing of the sessions:** Comments included 'let parents know soon after coming to the unit that these sessions

*will be running' and 'doing the sessions before birth may be beneficial'.*

## Discussion

It is essential that parents on the NICU are supported and encouraged to care for their infant from the time of admission. Implementing a parent simulation programme, in addition to providing informal cot-side education and support for families following admission, was shown to improve parental confidence. Although small group parental education programmes are becoming more common on neonatal units, our study demonstrates

how simulation technology can be integrated with traditional teaching methods to promote early parental participation in caring for their infant. A 2017 study evaluated the use of a parent simulation programme at the point of discharge; the findings were similar – simulation was well received.<sup>4</sup>

Our study demonstrated improved self-confidence in all sessions. By enhancing confidence and thereby empowering families, it is anticipated that families will take a more active role in their infant's care and become the primary caregivers early in the admission, thus optimising patient care. By implementing a reproducible educational-behavioural programme for families early in their neonatal admission, improvements have been shown in parental mental health, parent-infant interaction and reduced hospital length of stay.<sup>5</sup>

There were several limitations of our study. Firstly, it is important to emphasise that this simulation programme runs parallel with informal cot-side teaching and support already provided to families,

not instead of, promoting early parental participation. This was a single site study therefore feedback may have been influenced by the continued professional relationship with the faculty during their stay. Secondly, only 47% of families attended at least one session, only 8% attending all four sessions. Timing and frequency of the sessions may have influenced attendance, as well as unit promotion and patient-transfer to another NICU. Continued expansion and training of faculty will allow for further flexibility of programme delivery. In addition, continued promotion to both staff and families will embed the programme into unit culture with an aim to improve family uptake in the future. Continued evaluation will be required to validate our findings. Thirdly, we did not analyse infant health outcomes and therefore are unable to demonstrate any infant benefits.

### Conclusion

Simulation is an innovative way of delivering education to families in NICUs.

Implementing a parent simulation programme early in the neonatal admission is beneficial and improves confidence among families caring for their infant.

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