

Educational intervention on preterm infants' behaviours for the promotion of parental confidence

Supporting parents in understanding the behaviour of their preterm infant can promote parental confidence. A clinical project consisting of an educational intervention that aimed to support parents in their observation, interpretation and response to their preterm infant's behaviours within the motor subsystem was evaluated for its effectiveness in promoting parental confidence. The initial evaluation of the educational intervention suggests that parental confidence was improved. Mothers were satisfied with each component of the educational intervention.

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Key points

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1. A preterm infant's unique behaviours can be difficult for parents to interpret.
2. Lack of knowledge in the interpretation of behaviours may increase parental stress and undermine confidence.
3. An educational intervention focusing on a preterm infant's motor subsystem can promote parental confidence.

Introduction

Due to their immaturity, preterm infants communicate differently from term infants, with distinctive signs and a unique 'language'.^{1,2} Their stress responses can be interpreted by parents as negative replies to their attempts to interact with them³ and even be perceived as a rejection.⁴ As preterm infants' behaviours are less comprehensible for parents,⁵ it may complicate the establishment of the parent-infant relationship⁶ and thus undermine their parental confidence.^{7,8} Inspired by Zahr,⁹ Raines and Brustad define parental confidence as: "The perception of capability in caring for and understanding the infant and the infant's needs".^{9,10}

The level of parental confidence in parents of preterm infants is lower than those of term infants.⁸ Parents report a lack of knowledge and skills about the observation and interpretation of their preterm infant's specific behaviours, which could affect their parental confidence.⁷ Moreover, a lack of knowledge on how to interact with their preterm infant,¹¹ coupled with an inability to fully exploit their parental role,^{12,13} can cause high stress in such parents. This high level of stress would also have a negative impact on parental confidence.^{9,14,15} Therefore, the promotion of parental confidence could improve the interactions between parents and their preterm infant, reduce the level of parental stress and facilitate the establishment of the parent-infant relationship.^{10,16,17}

In order to increase parental confidence, mothers would appreciate receiving information about the behavioural responses of their preterm infants, as well as support and feedback from nurses during interactions with their infants.¹⁸ Supporting parents to understand their preterm infants' behaviours would thus meet their needs for information and proximity¹⁹ and respect the recommendations of neonatal experts.^{1,20-22}

Learning about their preterm infant's specific behaviours can be beneficial for parents as it increases their knowledge and understanding and promotes more sensitive and positive interaction.^{6,23-25} In addition, they show more nurturing attitudes toward their preterm infant²⁶ and lower levels of stress.²⁵ Parents are significantly more confident and have stronger beliefs with regard to their parental role.²⁵

Based on the synactive theory of development,¹ a clinical project consisting of an educational intervention that aims to support parents with the observation, interpretation and response to their preterm infant's motor behaviours was developed as part of the first author's (KL) graduate studies. The purpose of this article is to present the initial evaluation of this educational intervention with regard to the promotion of parental confidence, as well as parents' satisfaction about the intervention, and discuss successes and challenges encountered throughout its implementation that can guide clinical practice and nursing research.

Theoretical and empirical framework

The synactive theory of development¹ guided the content of the educational intervention. This theory, that aims to promote the individual development of preterm infants, classifies behaviours into five subsystems (autonomic, motor, states, attention/interaction, and self-regulatory), identifies preterm infants' signs of stress and adaptation, and suggests interventions to support preterm infants in the presence of signs of stress.¹ For the educational intervention, the preterm infants' motor subsystem was targeted, since the related signs of stress and adaptation are more easily observable for parents.

According to the synactive theory of development, when signs of stress are observed in preterm infants, it is important to intervene in order to bring them back to a comfort zone, and thus promote the emergence of signs of adaptation. Hand containment is a technique that reduces stress in preterm infants and allows them to develop adaptation strategies.^{1,20} It consists of holding the preterm infant in the fetal position, with a firm touch and slight pressure.^{27,28} This technique is recommended during stressful or painful,^{1,29,30} procedures as it:

- promotes a preterm infant's stability¹
- regulates physiological, behavioural and motor systems²⁷⁻²⁹
- reduces stress^{1,27}
- restores a calm state.²¹

Parents should be taught about their preterm infant's behaviours and encouraged to perform hand containment as this single technique could improve their confidence, involvement and competence, and enhance parent-infant interactions thus facilitating the development of their relationship.^{10,20,21,24} This underscores the importance of developing parental confidence by supporting parents in their observation and interpretation of their preterm infant's behaviour, as well as in their response to signs of stress with hand containment.

Methods

Environment and recruitment of participants

Parents were recruited in a neonatal unit of a university health centre in Montreal, Canada, over a 75-day period. They were eligible if they had a preterm infant born between 28-32 weeks of gestation. This

gestational age was selected according to the synactive theory of development, stating that preterm infants born ≥ 28 weeks of gestation show more signs of stress related to the motor subsystem²⁷ and inclusion criteria of previous studies with a similar educational intervention.^{6,31} Also, from 28 weeks of gestation, preterm infants are able to better differentiate the type of touch; whether it is soft or painful.³²

Parents were excluded if their preterm infant met one or more of the following criteria:

- grade II to IV cerebral hemorrhage
- congenital malformation
- had undergone surgery
- receiving palliative care.

In addition, multiple pregnancies were excluded and families where the mother had severe physical or psychological health problems preventing her from receiving the educational intervention at the neonatal unit.

The research ethics board of the university health centre where the educational intervention was implemented approved the clinical project. Eligible families were approached on postnatal day 7 to allow them time to become more familiar with the neonatal environment, as anxiety during the first visits to the neonatal unit could impede learning.³³ An invitation card that briefly described the educational intervention was left at the preterm infant's bedside. The first author (KL) met families who wanted more information about the project. Participants signed a consent form and a copy was given to them. Both parents were invited to participate in the intervention, but if only one of them was available the intervention was nonetheless delivered.

The educational intervention

The educational intervention on preterm infants' behaviours within the motor subsystem was divided into three sessions. The first session (30 minutes) took place in a family meeting room and aimed to present developmental care and describe a preterm infant's motor subsystem and signs of stress and adaptation, using a visual support (TABLE 1). Hand containment was explained and parents were invited to practise this technique on a doll. Parents were told to:

- perform this technique in the presence of signs of stress or when their preterm infant was in a quiet waking state
- refrain from performing this technique

Signs of stress	Signs of adaptation
Stiff or tense arms/legs/body	Hands and feet joined together
Fingers spread wide apart	Hand-to-mouth
Limp posture	Sucking or seeks to suck
Protects face with hands/arms	Grasping or seeks to grasp an object
Sticks tongue out	
Grimaces	

TABLE 1 Visual support for teaching signs of stress and adaptation to parents (adapted from Als 1982³¹).

when their preterm infant was in a sleep state.¹

As a visual tool with pictures and simple language facilitates learning,¹⁵ an aide-mémoire with images of a preterm infant's behaviours within the motor subsystem and hand containment technique was given to parents (FIGURE 1). Parents were invited to record their observations and interpretations of their preterm infant's behaviours, as well as their responses to his/her signs of stress, in a diary. Before the second session, parents were asked to complete the diary three times on three different days.

The second session (30 minutes) was held at the preterm infant's bedside. The diary was consulted to identify parents' appropriate responses according to their observations and interpretations of their preterm infant's behaviour. The learning points from the first session were briefly reviewed and then, in the presence of the first author (KL), the parents were invited to observe their preterm infant's behaviours during routine care, interpret them, and respond accordingly with hand containment. They referred to the aide-mémoire as needed and discussed their observations and interpretations with KL. Again, parents were invited to complete the diary three times on three different days before the next session.

The third session (10-15 minutes), which was held at the preterm infant's bedside, aimed to review the content of the educational intervention and consolidate learning. A symbolic certificate of participation was given to parents.

Evaluation of the intervention and parent satisfaction

At the last session, a 13-point questionnaire, presented in the form of a

bipolar Likert scale, was given to the parents (TABLE 2). The first nine items aimed to assess parental confidence and whether parents felt more able to interpret their preterm infant's behaviour and respond adequately. The other four items assessed parental satisfaction with regards to the appropriateness of the intervention components, activities and modalities. The questionnaire also included a section for comments or suggestions. Diaries were also collected at the end of the educational intervention to gather data on the parents' observations, interpretations, and responses to their preterm infant's behaviours.

Results of the initial evaluation

Eight eligible families were approached to participate in the educational intervention: one refused to receive further information about the intervention, two did not answer the invitation card and five families were recruited. Although the educational intervention was offered to both parents, only mothers were able to participate in all three sessions. Three fathers were present at the first session and one of them partly completed the diary. All fathers were

absent in subsequent sessions due to family and work obligations. Thus, only mothers were asked to complete the questionnaire on parental confidence and satisfaction.

The analysis of the questionnaire highlighted several benefits for mothers (TABLE 2). They reported a better understanding and interpretation of their preterm infant's behaviours and recognition of most signs of stress and adaptation. They also reported an appropriate use of the hand containment technique when their preterm infant showed signs of stress. All mothers felt more confident when interacting with their preterm infant and satisfied with their parental role. They were satisfied with the educational intervention as it met their needs and had beneficial effects for themselves and their preterm infant.

The diaries completed by four of the five families revealed the parents' accuracy in their interpretations of their preterm infant's behaviours and initiative in their responses to their infant's signs of stress with hand containment in different contexts, from routine care to diagnostic procedures. Mothers were able to identify signs of stress and adaptation.

Discussion

The implementation of an educational intervention with parents of preterm infants was successful, as it appeared to have promoted parental confidence. Mothers reported that they felt more confident when interacting with their infants and were able to recognise their different behaviours and used the hand containment technique appropriately. Parents also performed hand containment in contexts other than those taught in the educational intervention, reflecting that they had well integrated this technique. The educational intervention and its various components were also deemed relevant and useful; it brought benefits to mothers and met their needs and expectations, contributing to their high level of satisfaction with regard to the intervention.

Even though the educational intervention only targeted the motor subsystem, the results are similar to those of previous studies that encompassed more than one subsystem. These studies show that parents who received this type of educational intervention had a greater knowledge and a better understanding of their preterm infant's specific behaviours, as well as increased parental confidence.^{6,23-25} This reveals that an educational intervention focusing on preterm infants' behaviours relating to only a single subsystem can be potentially as beneficial for parents as an educational intervention addressing several subsystems.

Challenges in the implementation of the educational intervention

Some challenges were encountered during the implementation of the educational intervention. It was difficult to plan the last two sessions based on the availability of both parents, so that only the mothers were present at these sessions. Moreover, as the routine care was not performed according to a predetermined schedule, the practice of the hand containment technique at the second session did not always coincide with the planned sessions. When routine care had already been given, a kangaroo care session was proposed.

Limits

The main limitation of this project remains the small sample size due to the prescribed academic curriculum and restrained participation of fathers. Only three fathers participated in the first session and none of



FIGURE 1 The aide-mémoire.

Questions on the effectiveness of the educational intervention	Strongly agree n (%)	Agree n (%)	Undecided n (%)	Disagree n (%)	Strongly disagree n (%)
1. Since the educational intervention, I understand my baby's behaviours better	5 (100)				
2. I can recognise most of my baby's signs of stress and adaptation	5 (100)				
3. Since the educational intervention, when I observe signs of stress in my baby, I use the hand containment technique	5 (100)				
4. Since the educational intervention, I can use the hand containment technique in appropriate situations	5 (100)				
5. Since the educational intervention, I feel more confident when I interact with my baby	4 (80)	1 (20)			
6. Since the educational intervention, I am more prone to participate in the care of my baby*	4 (80)				
7. I am satisfied with my parental role	5 (100)				
8. The educational intervention has been beneficial for my baby	4 (80)	1 (20)			
9. The educational intervention has been beneficial for me	3 (60)	2 (40)			
Questions on parents' satisfaction with the educational intervention	Strongly agree n (%)	Agree n (%)	Undecided n (%)	Disagree n (%)	Strongly disagree n (%)
10. The educational intervention met my needs*	3 (60)	1 (20)			
11. The content of the educational intervention was appropriate*	3 (60)	1 (20)			
12. The observation of my baby's behaviours and practice of the hand containment technique during the second session was useful	3 (60)	2 (40)			
13. I am satisfied with the written information that was given to me (aide-mémoire)	5 (100)				

FIGURE 2 Results of the questionnaire on the effectiveness the educational intervention and parents' satisfaction with the educational intervention. *Question was answered by only four mothers.

them were present at the last two sessions. This seems to be a reality shared by other studies involving the same type of intervention.^{6,26} Fathers have difficulties getting time off from work and must care for older children, which may restrict their presence at their infant's bedside.³⁴ The absence of fathers in the last two sessions, and hence the lack of assessment of parental confidence and satisfaction in fathers, restricts the generalisability of the results.

The completion of the diary proved to be highly variable from one family to another, representing an important limit related to the fidelity and evaluation of the intervention. Although a diary is a reliable and efficient method of data collection, it still requires the participants' involvement and commitment, as well as their motivation and cooperation.³⁵ In future studies, it would be interesting to consider more attractive methods of data collection, such as electronic diaries.

Recommendations for clinical practice

As mothers appreciated all aspects of the intervention, it should be implemented according to the study design. However, since the practice with the preterm infants during the second session was difficult to synchronise with routine care, it may be appropriate to combine it with a different daily activity, such as kangaroo care or various nursing and medical procedures.

Although attendance of fathers was not required for the implementation of the educational intervention, their presence and involvement are still highly desirable during parental lessons. As fathers spend less time in the neonatal unit, they may struggle to develop an attachment relationship with their preterm infant.³⁶ It is therefore essential to encourage their presence and their participation in educational interventions that allow them to develop confidence in their paternal role as well. Maguire and colleagues⁶ recommend the implementation of flexible

interventions, with varied schedules, to improve accessibility for fathers, in addition to offering written information. Online access to information may be useful for reaching fathers who are not available to receive the educational intervention in person.

As neonatal nurses care for families of preterm infants, the implementation of such an educational intervention would necessitate further education. Thus, maintaining the training of neonatal nurses on the specific behaviours of preterm infants should be prioritised so that they can support parents with the observation, interpretation and response to their infant's behavioural cues.⁶

Recommendations for research

Although the educational intervention resulted in positive outcomes for mothers of preterm infants who participated, a more rigorous assessment of its effects on parental confidence through an

experimental design with a sufficient sample size is needed. It would be relevant to assess whether this type of intervention has an impact on parental involvement in preterm infant care and presence at the bedside. A comparison between mothers and fathers with regard to the aforementioned outcomes would also be pertinent, as would a study evaluating the effects of this intervention over an extended period of time.

Conclusion

The positive results of this clinical project consisting of an educational intervention emphasise the importance of supporting parents in their observation, interpretation and response to their preterm infant's motor behaviours. The educational intervention was well received by mothers and led to an improvement of their ability to observe and interpret the behavioural cues of their preterm infant within the motor subsystem, and respond to signs of stress appropriately with the hand containment technique. The initial evaluation encourages the implementation of this educational intervention in clinical settings in order to promote parents' confidence about their ability to take care of their preterm infant.

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