Educational Intervention for an Evidence-Based Nursing Practice of Skin-to-Skin Contact at Birth

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ABSTRACT

This article presents the development and evaluation of an educational intervention aiming at an evidence-based practice of skin-to-skin contact at birth among nurses of a maternity care unit. Based on the Iowa Model of Evidence-Based Practice to Promote Quality Care, four educational sessions were developed according to an active-learning pedagogy. Even if the nurses' practice did not fully meet the recommendations for skin-to-skin contact, a pre- and postintervention evaluation showed some positive results, such as a longer duration of skin-to-skin contact immediately after birth, delivery of some routine care directly on mothers' chest, and improved parent education. The educational intervention seems to have enacted some evidence-based nursing practice changes regarding skin-to-skin contact at birth.

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According to the recommendations of the American Academy of Pediatrics (AAP, 2012), healthy term newborns should be placed in skin-to-skin contact with their mother at birth or promptly afterward. Early continuous skin-to-skin requires positioning

naked newborns prone on their mother's bare chest immediately after birth (Moore, Anderson, Bergman, & Dowswell, 2012). It provides both newborns and mothers with many short- and long-term benefits (Moore et al., 2012; Table 1). As this practice should be the standard in health care centres that deliver perinatal care (Haxton, Doering, Gingras, & Kelly, 2012), any intervention interrupting the continuous skin-to-skin contact in immediate postpartum

Early continuous skin-to-skin requires positioning naked newborns prone on their mother's bare chest immediately after birth.

TABLE 1
Benefits of Skin-to-Skin Contact

Short Term	Long Term
Facilitates the initiation of breastfeeding (Aghdas, Talat, & Sepideh, 2014; Carfoot, Williamson, & Dickson, 2005; Dageville et al., 2011; Hung & Berg, 2011; Moore & Anderson, 2007; Walters et al., 2007)	Increases the rate of exclusive breastfeeding at discharge (Gabriel et al., 2009)
Improves newborns' thermoregulation in postpartum	Helps to maintain the newborn's temperature during frequent changes of position when breastfeeding difficulties occur (Chiu et al., 2005)
Increases newborns' temperature in presence of hypothermia (Bystrova et al., 2003; Chiu, Anderson, & Burkhammer, 2005; Dabrowski, 2007; Fransson, Karlsson, & Nilsson, 2012; Gabriel et al., 2009; Mori, Khanna, Pledge, & Nakayama, 2010; Walters et al., 2007)	
Helps to maintain the newborn's blood glucose levels within the expected norms in postpartum (Moore et al., 2012; Walters et al., 2007)	Facilitates the development of the attachment bond (Dageville et al., 2011; Nyqvist et al., 2010a)
Reduces stress caused by birth	Improves the mutual recognition mother–newborn (Dabrowski, 2007; Dageville et al., 2011)
Improves the transition to extrauterine life	
Calms newborns and reduces crying (Bystrova et al., 2003; Christensson et al., 1995; Dabrowski, 2007)	
Increases the activation of different sensory systems (Dageville et al., 2011)	Reduces risk of maternal depression (Nyqvist et al., 2010a)
Improves the control of pain in mothers (distraction caused by the close presence of the newborn) (Dabrowski, 2007)	Improves the control of pain in mothers and newborns (Dabrowski, 2007; Gray, Watt, & Blass, 2000; Kashaninia, Sajedi, Rahgozar, & Noghabi, 2008)
Fasten the expulsion of the placenta (Gabriel et al., 2009)	
Reduces the risk of postpartum hemorrhage (Dordevic, Jovanovic, & Dordevic, 2008)	

should thus be revised, and health care centre policies should be changed accordingly (AAP, 2012).

However, a contemporary trend is to separate the mother and her newborn in the first minutes or hours of life to perform various nonurgent care (Moore et al., 2012). The separation of the mother and her newborn has become a routine that is firmly rooted in clinical practice (Dabrowski, 2007; Phillips, 2013; Walters, Bogg, Ludington-Hoe, Price, & Morrison, 2007) and occasionally corresponds to postnatal care protocols in some health care centres (AAP, 2012; Dageville, Casagrande, De Smet, & Boutté, 2011). This questionable practice unreasonably stresses the newborn (Bergman & Bergman, 2013; Bystrova et al., 2009) because most neonatal routine care, such as the injection of vitamin K, application of ophthalmic ointment, and assessment of vital signs, could easily be performed while the newborn is in skin-to-skin contact or delayed (AAP, 2012; Dabrowski, 2007; Moore et al., 2012; Phillips, 2013; Smith, Moore, & Peters, 2012). Nevertheless, newborns are still often removed from their mother's chest without a justified reason or firmly swaddled, preventing a sufficient and adequate period of skin-to-skin contact (Dumas

et al., 2013; Ferrarello & Hatfield, 2014), denoting a suboptimal clinical practice that is inconsistent with current recommendations. To implement an evidence-based practice change, all health professionals involved in the perinatal period should be trained to adopt practices that are supportive of skin-to-skin contact in immediate postpartum (Nyqvist et al., 2010a).

Different examples of educational interventions that aim to implement an evidence-based practice change among nurses and other health-care professionals regarding skin-to-skin can be found in the scientific literature. Brimdyr, Widström, Cadwell, Svensson, and Turner-Maffei (2012) evaluated the impact of a 5-day immersion program combining expert education, practical application of evidence, video ethnography, and interaction analysis on the sustainability of optimal skin-to-skin practices among a group of different health-care professionals. They concluded that the combination of different strategies led to significant and sustainable changes in practice, compared to a 5-day conventional education program. Similarly, Haxton et al. (2012) report a clinical project that aimed to implement early skin-to-skin in a labor and delivery unit.

Four educational sessions, using both magistral presentations and discussions with nurses about the implementation of early skin-to-skin contact, resulted in increased initiation of skin-to-skin contact immediately after birth by 40%–68% (Haxton et al., 2012). Dabrowski (2007) also describes one hospital's experience of the implementation of early skin-to-skin contact through an educational intervention that comprised a presentation, a forum of discussion, and additional resources, such as videos and poster presentations. The combination of different resources in this educational intervention acted like a lever for a successful change in clinical practices (Dabrowski, 2007). Thus, educational interventions seem to be a valuable strategy for the implementation of an evidence-based nursing practice change regarding skin-to-skin contact.

However, traditional teaching approaches are often used in the education of health-care professionals even though these methods are rather passive and unsuited to their needs (Prior, Guerin, & Grimmer-Somers, 2008). The lecture is still the most common method of teaching/learning (King's Fund, 2006), although it rarely leads to a change in practice (Oxman, Thomson, Davis, & Haynes, 1995; Prior et al., 2008). Educational interventions using an active-learning approach (Haines, Kuruvilla, & Borchert, 2004; National Institute for Health and Clinical Excellence [NICE], 2007; O'Brien, 2008; Prior et al., 2008) and various teaching strategies (Brimdyr et al., 2012; Dabrowski, 2007; Haxton et al., 2012) should be favored to implement evidence-based practices.

This article highlights the implementation of educational intervention aimed at an evidence-based practice change regarding early skin-to-skin contact in a maternity unit, a process that was guided by the Iowa Model of Evidence-Based Practice to Promote Quality Care (Titler et al., 2001). Based on an active-learning approach, an educational intervention aiming at a practice of early skin-to-skin contact that is consistent with the most recent and rigorous evidence was delivered and evaluated with labor and delivery, nursery, and postpartum nurses.

The involvement of learners in the learning process and interactions with peers greatly increases information retention rates, facilitates the development of critical thinking, and provides better results in terms of learning among nurses.

TABLE 2

Steps Inspired by the Decisional Algorithm of the Iowa Model of Evidence-Based to Promote Quality Care (Titler et al., 2001) for the Implementation of an Evidence-Based Practice

Iowa Model of Evidence-Based Practice to Promote Quality Care (Titler et al., 2001)	
Step 1	Identify a clinical problem.
Step 2	Decide if the problem is a priority for the organization.
Step 3	Form a team.
Step 4	Assemble relevant research and related literature.
Step 5	Critique and synthesize research for practice.
Step 6	Pilot change in practice and evaluate results.
Step 7	Fully implement the change in practice and follow-up.

Evidence-Based Practice Framework and Educational Approach

The Iowa Model of Evidence-Based Practice to Promote Quality Care (Titler et al., 2001) guided the process of implementing the educational intervention aimed at an evidence-based change about the practice of skin-to-skin contact after birth. This evidence-based practice framework aims to improve quality and safety of care (Cullen & Adams, 2010) by encouraging nurses to question their current practices through a series of steps which follow a decision algorithm (Schaffer, Sandau, & Diedrick, 2013). The steps followed throughout this evidence-based practice project (Table 2) were closely inspired by this model. The combination of the evidence-based practice framework with an active-learning approach supported the development of an educational intervention that intended to trigger the change of practice and meet the learning needs of labor and delivery, nursery, and postpartum nurses. This educational approach, which encourages the use of learner-centered teaching methods that actively engage learners in the learning process, has a positive impact on knowledge transfer and research use (Hoke & Robbins, 2005). The involvement of learners in the learning process and interactions with peers greatly increases information retention rates (by 60%–80% [Herreid, 2011]), facilitates the development of critical thinking, and provides better results in terms of learning among nurses (Hoke & Robbins). This approach was used to maximize the retention of information and thus facilitate the change of practice by creating a useful and meaningful educational intervention for nurses.

METHOD

Clinical Setting and Sample

The educational intervention was implemented in a maternity unit of a university-affiliated health care centre in the greater Montreal area, from June 8 to July 11, 2013. The maternity unit counted 50 nurses in total and carried out on average more than 1,700 deliveries annually. Nurses were recruited through posters in various sectors of the maternity unit (labor and delivery room, nursery, and postpartum unit) and were personally invited by the head nurse of the maternity unit, the lactation consultant nurse, and the first author (JPT). Nurses were eligible to participate in the educational intervention if they had been trained to work in the labor and delivery room or at the postpartum unit.

Development Stages of the Educational Intervention

Preintervention Evaluation. To guide the development of the educational intervention, observations of the clinical practice were carried out in preintervention, on 2-day shifts, at the labor and delivery room, to target nurses' learning needs about skin-to-skin contact. An observation grid was used to collect data related to the practice of early skin-to-skin contact (Table 3). These observations allowed the documentation of gaps in nurses' practice and barriers to evidence-based practice of skin-to-skin contact and consequently the identification of the subjects to be discussed in the educational intervention. Selected subjects were validated with nurses to assess their interest and learning needs prior to the development of the content of the educational intervention.

Modalities and Content of the Educational Intervention. Inspired by the clinical project of Haxton and colleagues (2012), four 30-minute educational

sessions were delivered to nurses to develop their knowledge and skills about skin-to-skin contact promptly after birth. The sessions were given twice on lunch break, to reach a maximum of nurses. They were offered about a week apart, allowing for the application of new knowledge into practice after each session, retention of the information, and gradual initiation of change in clinical practice. The selected subjects, teaching/learning methods, and information supplements are presented in Table 4. As the educational intervention received the accreditation for continuing education from the Faculty of Nursing of the Université de Montréal, nurses who participated in the four educational sessions obtained two accredited hours of continuing education.

The educational sessions took the form of small working groups, where interactions between the participants were encouraged. This teaching/learning method is known to be more effective for knowledge transfer than passive education (Haines et al., 2004; NICE, 2007; O'Brien, 2008; Prior et al., 2008). Other teaching/learning methods, such as discussion, case studies, and role-playing (see Table 4), were carefully chosen to support the co-construction of knowledge with peers and add a social dimension to the learning process. Furthermore, as the combination of different knowledge transfer strategies increases the probabilities of achieving the desired goal, in this case an evidence-based practice (Boaz, Baeza, & Fraser, 2011; NICE, 2007; Oxman et al., 1995; Prior et al., 2008), different information supplements were given to nurses (see Table 4).

Postintervention Evaluation. Following the educational intervention, two evaluations were performed. First, nurses' satisfaction regarding the intervention was assessed using a semistructured questionnaire that included 10 questions with 5-point Likert scale answers and 7 short-answer questions. The questionnaire aimed to identify strengths and limits of the educational intervention as well as the facilitators and barriers to evidence-based practice of early skin-to-skin contact. The questionnaire, which was given to all nurses who participated in at least one educational session, was completed anonymously. An observation of the clinical practice was also carried out in the labor and delivery room after the educational intervention to assess the clinical practice related to early skin-to-skin contact. The first author (JPT) conducted the observation on 2-day shifts and used the same grid as for the preintervention evaluation.

TABLE 3
Elements of the Observation Grid Used For Pre- and Postintervention Evaluation

Health-care professionals and family members present at birth and during the first hour postpartum
Characteristics of the birth and immediate postpartum period that have an influence on the practice of skin-to-skin contact (e.g., assisted vaginal birth, mother's health status, newborn's health status)
Sequence of actions performed by nurses in immediate postpartum
Moment when skin-to-skin contact is initiated and duration
If applicable, reasons, conditions, and interventions interrupting skin-to-skin contact

TABLE 4
Description of the Sessions and Additional Information

Session	Themes Addressed	Teaching Methods/ Selected Learning	Additional Resources
Session 1	Definition of skin-to-skin contact Benefits of skin-to-skin contact (mother and newborn)	Lecture Discussion in large group Viewing of a short video	List of skin-to-skin contact benefits (displayed in the different sectors of the maternity unit and a copy for each participant)
Session 2	Possible solutions to enhanced actual practice Safe installation of the newborn in skin-to-skin contact Guidelines for the practice of skin-to-skin contact in the immediate postpartum	Individual reflection Role-playing (demonstration of the installation) Scenario Discussion in large group	Two scientific articles on the skin-to-skin contact with abstracts offered
Session 3	Assessment of the couples' expectations regarding childbirth Information to give to couples on the progress of childbirth and interventions in the immediate postpartum Couples' education (skin-to-skin contact benefits) Proper monitoring during skin-to-skin contact period	Lecture Simulations Discussion in large group	Five posters in childbirth rooms extolling the benefits of skin-to-skin contact
Session 4	Skin-to-skin contact with premature and/or low birth weight infants Skin-to-skin contact postcesarean	Quiz Lecture	

Data from the pre- and postintervention evaluations were then compared to highlight changes in practice and identify remaining gaps in the implementation of early skin-to-skin contact that is consistent with current evidence.

RESULTS

Thirty-eight nurses of the maternity unit, including candidates to the nursing profession and 11 nurses of the labor and delivery room, attended one or more educational sessions. An attendance of 14 to 19 nurses was observed per session. Four nurses (10.5%) attended all four educational sessions, 4 (10.5%) nurses participated in three sessions, 9 nurses (23.7%) assisted to two sessions, and most of the nurses ($n = 21$, 55.3%) were present at a single session.

Pre- and Postintervention Evaluation

Four births before and four births after the educational intervention were observed with the previously described observation grid. A comparative summary of the observations made in pre- and postintervention is presented in Table 5.

In the preintervention evaluation, six nurses were observed while they were providing care for mothers and their newborn in the immediate postpartum

period. For each birth, the action sequence was the same: The newborn was dried, suctioned with bulb syringe, and placed on the mother. On average, mother–infant dyads had skin-to-skin contact for a period of 20 minutes and no education about skin-to-skin contact was offered to parents. Skin-to-skin contact was interrupted to perform various actions: preparation for breastfeeding, taking pictures, changing of position, and mobilization of the mother. The clinical condition of one newborn justified the cessation of skin-to-skin contact. In addition, in all observed situations, routine care, such as newborn measurements, injection of vitamin K, and application of ophthalmic ointment, was made under a heating lamp quickly after birth. Skin-to-skin contact was with mothers in each situation. A father also performed skin-to-skin contact following routine care. Most observed infants ($n = 3$) were swaddled in many blankets after routine care before being transferred to the postpartum unit in the arms of a parent.

In the postintervention evaluation, seven nurses were observed in immediate postpartum: Four of them received the educational intervention (two nurses attended two sessions and two nurses attended one session) and three nurses did not receive

TABLE 5
Results—Comparison of Observations Pre- and Postintervention

	Observations Preintervention	Observations Postintervention
Number of births observed	4 vaginal births: spontaneous ($n = 3$) assisted by vacuum ($n = 1$)	4 vaginal births: spontaneous ($n = 4$)
Number of nurses observed	6 nurses	7 nurses (2 nurses participated in 2 sessions, 2 nurses participated in 1 session, and 3 nurses had not participated in any sessions)
Mean length of skin-to-skin contact	20 minutes	26 minutes
Reasons for ending the skin-to-skin contact	Getting ready for breastfeeding ($n = 1$) Getting ready for breastfeeding and taking pictures ($n = 1$) Changing position/mobilization of the mother ($n = 1$) Clinical status of newborn ($n = 1$)	Repositioning during breastfeeding ($n = 1$) Allowing mother to go to the bathroom ($n = 1$) Clinical status of newborn ($n = 2$)
Education to the mother/family during the intrapartum period on the skin-to-skin contact	None	Criteria of an adequate positioning ($n = 1$) Benefits of the practice ($n = 2$)
Routine care (newborn measurements, vitamin K injection, ophthalmic ointment application)	All performed under the radiant warmer	Performed on the mother's thorax ($n = 1$) Partially done in skin-to-skin contact and under the radiant warmer ($n = 3$)
First skin-to-skin contact	All first contacts done by mothers	All first contacts done by mothers
Father's implication	Period of skin-to-skin contact with father ($n = 1$)	Period of skin-to-skin contact with father ($n = 1$)
Transfer to the postpartum unit	Swaddled in a blanket in the arms of a parent ($n = 3$) In skin-to-skin contact with father ($n = 1$)	Swaddled in a blanket in the arms of a parent ($n = 4$)

the educational intervention. For each birth, a dyad of nurses, composed of at least one nurse who partially received the educational intervention, was observed using the observation grid. On average, skin-to-skin contact was performed continuously for a period of 26 minutes. Some subjects related to skin-to-skin contact, such as the benefits and positioning, were discussed with parents in three of the four cases observed. Newborns were removed from their mother's chest for repositioning during breastfeeding and for allowing the mother to go to the bathroom. Two newborns were removed: one at the request of the physician to perform an oral-gastric aspiration following a meconium-stained amniotic fluid and the other because of breathing difficulties in the newborn that required nursing interventions. In one of the situations observed, most routine care was done directly on the mother's chest. Skin-to-skin contact was initiated with mothers in the four observed situations. A father performed skin-to-skin contact before being transferred to the postpartum unit. Finally, in three of the four cases

observed, when skin-to-skin contact was interrupted, newborns were promptly returned on their mother's chest.

Evaluation of the Educational Intervention

A 53% (20 of 38) response rate was obtained for the satisfaction questionnaire on the educational intervention. Results are synthesized in Table 6 and presented in two cohorts: labor and delivery nurses and nursery and postpartum nurses. For all surveyed nurses, the educational intervention met most of their learning needs and supported the development of their knowledge regarding early skin-to-skin contact. According to them, the duration of the educational sessions was adequate (60% strongly agree [12 of 20 nurses]; 35% somewhat agree [7 of 20 nurses]), information was clear, precise, and realistic (80% totally agree [16 of 20 nurses]; 20% somewhat agree [4 of 20 nurses]), and teaching/learning methods used encouraged learners' active participation (60% strongly agree [12 of 20 nurses]; 40% somewhat agree [8 of 20 nurses]). A vast majority (90% [18

TABLE 6
Summary of the Results of the Satisfaction Survey

	Strongly Agree	Somewhat Agree	Neutral	Somewhat Disagree	Strongly Disagree
The educational intervention met my needs.	4 ^a 9 ^b T = 13 65%	1 ^a 6 ^b T = 7 35%	— —	— —	— —
The duration of the educational sessions was adequate.	2 ^a 10 ^b T = 12 60%	3 ^a 4 ^b T = 7 35%	— 1 ^b T = 1 5%	— —	— —
The educational intervention offered in sessions pleased me.	4 ^a 11 ^b T = 15 75%	1 ^a 2 ^b T = 3 15%	— 2 ^b T = 2 10%	— —	— —
The information provided during the educational sessions was clear, precise, and realistic.	5 ^a 11 ^b T = 16 80%	— 4 ^b T = 4 20%	— —	— —	— —
The teaching/learning methods used by the trainer stimulated the active participation of learners.	4 ^a 8 ^b T = 12 60%	1 ^a 7 ^b T = 8 40%	— —	— —	— —
The teaching/learning methods used by the trainer were different than the ones commonly used in trainings I have attended in the past.	1 ^a 3 ^b T = 4 20%	2 ^a 6 ^b T = 8 40%	2 ^a 3 ^b T = 5 25%	— 3 ^b T = 3 15%	— —
The information supplements provided were clear, accurate, and useful.	3 ^a 7 ^b T = 10 50%	2 ^a 6 ^b T = 8 40%	— 2 ^b T = 2 10%	— —	— —
The information supplements have contributed to improve my knowledge.	2 ^a 8 ^b T = 8 50%	3 ^a 3 ^b T = 6 30%	— 4 ^b T = 4 20%	— —	— —
Following this educational intervention, I consider having gained knowledge on the skin-to-skin contact in the immediate postpartum period.	3 ^a 10 ^b T = 13 65%	2 ^a 4 ^b T = 6 30%	— 1 ^b T = 1 5%	— —	— —
If such an educational intervention was offered to me again, I would like to participate.	3 ^a 9 ^b T = 12 60%	2 ^a 5 ^b T = 7 35%	— —	— 1 ^b T = 1 5%	— —

Note. T = Total of the two cohorts of nurses.

^aResults within the cohort "nurses working in the labor and delivery room."

^bResults within the cohort "nurses working in nursery and postpartum units."

of 20 nurses]) appreciated the format of the educational sessions and considered that information supplements were clear, accurate, helpful, and facilitated knowledge development. On the other hand, 15% of respondents (3 of 20 nurses) reported that the teaching/learning methods used were not different from commonly used methods in previous training program they had attended. Most of the

respondents (95% [19 of 20 nurses]) would participate again in such an educational intervention.

Some facilitators and barriers to the implementation of evidence-based practice of skin-to-skin contact were identified by nurses. The main facilitators highlighted by nurses were continuing education for health-care professionals ($n = 11$), parent education on early skin-to-skin contact ($n = 3$), health-care

professionals' attitude ($n = 3$), and delay in the admission routine and nonurgent care to newborns ($n = 2$). Nurses also discerned some barriers, the most common being the lack of knowledge among different health-care professionals working in the labor and delivery room ($n = 8$), routine care that has to be done after birth ($n = 6$), newborn's or mother's clinical condition ($n = 4$), resistance to change among health-care professionals and organizations ($n = 3$), and transfer to the postpartum unit ($n = 3$).

DISCUSSION

Changes in the Practice of Early

Skin-to-Skin Contact

Following the educational intervention, which aimed to improve the nursing practice of early skin-to-skin contact to be consistent with current evidence, some changes were observed in the clinical practice. The duration of skin-to-skin contact increased following the educational intervention, from an average of 20 to 26 minutes, whereas routine care, which was usually done only under a heating lamp and identified by nurses as a barrier to early skin-to-skin contact, was delayed or performed while the newborn was on the mother's chest. In addition, parent education on skin-to-skin contact was also improved. Thus, it seems that the educational intervention could positively contribute to the implementation of an evidence-based practice of early skin-to-skin contact.

The improvement of nursing practice can be explained by the acquisition of knowledge and reinforcement by information supplements. According to nurses' responses, almost everyone agreed that the educational intervention supported their acquisition of knowledge, whereas most identified it as the main facilitator for evidence-based practice of early skin-to-skin contact. The information supplements, such as posters about the benefits of skin-to-skin contact displayed in the different sectors of the maternity unit, also contributed to promote an adequate practice. Indeed, most nurses agreed that information supplements supported knowledge development.

However, despite these improvements, recommendations on different aspects of practice of skin-to-skin contact were not met. In fact, the duration of skin-to-skin contact in postintervention evaluation did not meet the recommendation, which is that the infant should be placed on the mother's chest until the end of the first lactation minimally, and up to 2 hours and more optimally (Bergman & Bergman, 2013; Dabrowski, 2007; Moore & Anderson, 2007;

Velandia, Uvnäs-Moberg, & Nissen, 2011). The marginal increase in the duration of skin-to-skin contact in postintervention evaluation can be explained by the premature removal of two of the four newborns because of their clinical condition. In addition, on a few occasions, parents and nurses unnecessarily removed the newborn from the mother's chest. As for parent education, it still remained too succinct, because some important information, such as when and who should initiate skin-to-skin contact, was not communicated to them.

Modest improvements can also be justified by the fact that nurses observed in postintervention evaluation had participated in few or none of the educational sessions. Effectively, their limited attendance to the educational sessions has certainly attenuated the amplitude of change in their clinical practice. Limited participation could be explained by multiple factors, including the personal motivation of nurses to change their clinical practice. In fact, low personal motivation to change is recognized as a major obstacle to the implementation of a change of practice (Canadian Institutes of Health Research, 2012). In addition, lack of time (Gale & Schaffer, 2009) and workload might also have mitigated the implementation of evidence-based practice of skin-to-skin contact. As the initiation of breastfeeding and development of mother–infant relationship are not fully promoted when skin-to-skin contact is interrupted (Widström et al., 2010), the barriers to the implementation of this practice need to be addressed to protect the continuity of this contact in immediate postpartum.

Nurses' Satisfaction With the Educational Intervention

Surveyed participants reported a high level of satisfaction with the intervention content, modality, and duration, as well as teaching/learning methods. It is interesting to note that the results of labor and delivery nurses and those of nursery and postpartum nurses regarding their satisfaction with the educational intervention are similar. The educational

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intervention seems to have been relevant for nurses and responded to their learning needs. However, a marginal proportion of nurses somewhat disagreed with the statement that the teaching/learning methods used were different from those used in previously attended training programs. This result can be explained by the fact that a training program on reduction of obstetric risks, using a similar educational approach, was offered to nurses of this maternity unit. In addition, a growing number of academic nursing programs are based on an active-learning approach (Goudreau et al., 2009). Overall, nurses seemed to be satisfied with the knowledge acquired through the educational intervention.

Strengths of the Educational Intervention

The educational intervention had three main strengths. The use of the Iowa Model of Evidence-Based Practice to Promote Quality Care (Titler et al., 2001) was useful in guiding the implementation and evaluation process of the educational intervention, fostering an understanding of the context of practice of skin-to-skin contact at the maternity unit, and adapting evidence to the clinical practice. Similarly, Haxton et al. (2012) report on the suitability of this model for implementing an evidence-based practice of early skin-to-skin contact, thus supporting its relevance. The use of an active-learning approach is another strength that allowed for a more dynamic teaching. The focus on the active participation of nurses in the development of their knowledge facilitated the change of practice in the clinical milieu. Our results, which are similar to previous research and clinical projects that used various teaching/learning methods (Brimdyr et al., 2012; Dabrowski, 2007; Haxton et al., 2012), confirm the effectiveness of an active-learning approach for the implementation of an evidence-based practice. Active teaching/learning methods are consistent with recent recommendations in perinatal education because they promote the development of multiple skills required to meet the increasingly complex needs of families (Simonelli & Gennaro, 2012). Finally, the combination of educational sessions with information supplements may also have contributed to the transfer of knowledge and improvement of the clinical practice, such as reported by previous research and clinical projects (Brimdyr et al., 2012; Dabrowski, 2007; Smith et al., 2012).

Limitations of the Educational Intervention

However, the clinical project presented some important limitations. First, few nurses were able to attend

all four educational sessions. This can be explained by the fact that the sessions were offered on two occasions only and the participation was voluntary. Consequently, four of the seven nurses observed in postintervention had attended one or two sessions of the educational intervention, whereas the others did not receive the educational intervention. This limitation highlights the importance of a supportive organizational context and the presence of adequate resources to encourage the participation of all nurses during the implementation of an evidence-based practice (Rycroft-Malone et al., 2004). In addition, this limit also stresses the importance of a more rigorous postintervention evaluation that targets nurses who attend the educational intervention more assiduously. The effects of the posters about the benefits of skin-to-skin contact and modeling from the nurses who attended the educational intervention on the other nurses of the maternity unit should also have been included in the postintervention evaluation. These important limitations of the postintervention evaluation need to be acknowledged because they contributed to the attenuation of our results.

The observation grid used in pre- and postintervention evaluation also imposed certain limits on the collection of some essential data. For example, the total duration of skin-to-skin contact in the first 2 hours of life was not calculated because the duration of skin-to-skin contact after a first interruption was not considered. The total duration of skin-to-skin contact could have been relevant to consider because Christensson, Cabrera, Christensson, Uvnäs-Moberge, and Winberg (1995) report that skin-to-skin contact after a 45-minute interruption reduces infant crying and stress. Moreover, several benefits, including the development of mother–infant attachment, are initiated in the early hours and first days of life (Dageville et al., 2011). The importance of returning the newborn in skin-to-skin contact promptly after an interruption is thus an aspect of the practice that needs to be emphasized. Finally, the small number of births observed in pre- and postintervention is a major limitation of this clinical project.

Implications for Nursing Practice

The educational intervention has positively modified the practice of early skin-to-skin contact. Some recommendations for practice resulting from the development, implementation, and evaluation of this

educational intervention can be proposed. First, the educational sessions should be mandatory, accredited for continuing education, and offered several times, on different shifts, during working hours to reach all nurses of a maternity unit. Information and communications technologies, such as web-based communications (Haxton et al., 2012), could also be used to reduce the barriers to participation and optimize clinical practice change. This would imply to put different organizational resources into place to create a supportive environment for evidence-based practice change (Fineout-Overholt & Melnyk, 2005).

The creation of a comprehensive education tool on early skin-to-skin contact for families is also a promising avenue for the standardization of patient education. In Haxton and colleagues' (2012) clinical project, a booklet on the benefits of early skin-to-skin contact has improved education to families. Furthermore, the education on skin-to-skin contact should begin during pregnancy (Calais, Dalbye, Nyqvist, & Berg, 2010) because it encourages mothers to perform early skin-to-skin contact (Martínez-Galiano & Delgado-Rodríguez, 2014) and should be continued after birth, during the hospitalization period (Nyqvist et al., 2010b).

Moreover, in combination with the educational intervention, and as suggested by the AAP (2012), a review of current protocols of care in the immediate postpartum period should be performed. This would be an opportunity to revise the sequence of actions to be implemented in immediate postpartum and address the barriers to an evidence-based practice of early skin-to-skin contact without interruption. Haxton and colleagues (2012) report that the implementation of a protocol of care following a vaginal birth contributes to increase the duration of skin-to-skin contact and improve related clinical practice.

Finally, we recommend the use of an evidence-based practice model, such as the Iowa Model of Evidence-Based Practice to Promote Quality Care (Titler et al., 2001), to guide the implementation process of an evidence-based practice in a clinical setting. The combination with an educational intervention inspired by an active-learning approach has shown positive results in improving the practice of nurses in the present and previous (Haxton et al., 2012) clinical projects.

Implications for Nursing Research

In light of these results, different research orientations can be proposed. First, it would be appropriate

to implement the educational intervention to all nurses working in immediate postpartum and evaluate the effects on their knowledge, attitudes, and clinical practice using validated observation grids and questionnaires. This recommendation is consistent with the Iowa Model of Evidence-Based to Promote Quality Care (Titler et al., 2001), which proposes to implement the intervention at a larger scale, based on the results of the intervention. Following Hogg, Lemelin, Moroz, Soto, and Russell (2008), the evaluation could be repeated at 3 and 9 months after the educational intervention to assess if changes in practice are maintained over time. The effects of the educational intervention could also be evaluated on families, just like Haxton and colleagues (2012) who assessed the impact of their clinical project on the improvement of family education, duration of skin-to-skin contact, and rates of breastfeeding initiation. In addition, it would be particularly interesting to assess the pre- and postintervention effects on the families' overall satisfaction regarding their health experience in the immediate postpartum period, on the frequency of skin-to-skin contact during hospitalization and after discharge, as well as on the exclusive and partial breastfeeding rates at discharge.

The addition of components to the current educational intervention would also be an interesting avenue for further research. Indeed, the inclusion of a reflective practice activity could help to bridge the gap between theory and practice and contribute to the development of critical thinking (Duffy, 2007). The critical analysis of a given situation and the consideration of its impact on action could have the potential to promote practice changes (Mann, Gordon, & Macleod, 2009). The counseling and assistance of a mentor, such as a clinical nurse specialist, could also be beneficial because it has already led to positive results in other contexts (Fineout-Overholt & Melnyk, 2005). A mentor could stimulate the development of nurses' professional skills and critical thinking, support nurses in their clinical practice, and ensure that nursing interventions are consistent with current evidence. In future studies, it would be relevant to evaluate whether the addition of these two components would lead to better clinical results than the educational intervention in its actual format.

CONCLUSION

This educational intervention is a first step toward an evidence-based practice of early skin-to-skin

contact. Guided by an evidence-based practice model and based on an active-learning approach, it has led to some improvements in the practice of skin-to-skin contact in the immediate postpartum period. The use of a combination of dynamic teaching/learning methods that engage learners at the heart of their learning appears to be an effective strategy for knowledge transfer and evidence-based practice changes.

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