

Understanding maternal perspectives of skin-to-skin contact for the management of acute pain in very and extremely preterm infants

Haleh Hashemi^a, Estreya Cohen^a, Michaela Garvey^a, Andrea Lebovic^a, Fabiana Bacchini^b, Lesley Johannsson^c, Carol Cheng^c, Vibhuti Shah^c, Rebecca Pillai Riddell^{a,c,*}

Abstract

Skin-to-skin care (SSC) and skin-to-skin contact for procedural pain (SSCP) are recognized for their physiological and emotional benefits in the neonatal intensive care unit (NICU), including pain reduction in preterm infants. However, little is known about how birthing parents of very and extremely preterm infants (<32 weeks gestational age), a significantly more challenging preterm infant population to enact SSCP, perceive this intervention. This study aimed to explore birthing parents' experiences and perceptions related to the use of SSC and SSCP in the NICU with their very and extremely preterm infants. In partnership with a national preterm parent organization, virtual interviews were conducted with 38 mothers of very or extremely preterm infants from across Canada, who had been admitted to the NICU within the past 5 years. Data were synthesized into 8 primary themes relating first to SSC broadly and then SSCP. In addition, mothers' opinions about a priori concepts and potential interventions (generated from pilot data) were also vetted. Important actionable facilitators and barriers related to fears and interventions to support SSCP with parents of very and extremely preterm infants were discerned. Although most found their experience rewarding, barriers such as limited instruction, inconsistent staff support, procedural challenges, and emotional strain often hindered the use of SSCP. Enhancing staff training, standardizing protocols, offering mental health support, and adopting flexible, family-centered policies appear key to improving SSCP engagement with the youngest preterm infants.

Keywords: Infant pain, Very and extremely preterm infants, Neonatal intensive care unit, Skin-to-skin care, Skin-to-skin contact for painful procedures

1. Introduction

Each year, approximately 1 in 10 children worldwide are born preterm (<37 weeks' gestation), with 15% of them born very and extremely preterm (V/EPT; born <32 weeks' gestation), placing them at increased risk for prolonged neonatal intensive care unit (NICU) stays, developmental challenges and higher rates of mortality and disability.^{14,34,43,52} In Canada, preterm birth contributes billions in annual healthcare costs.^{40,41}

In 2023, the World Health Organization recommended that all preterm infants receive at least 8 hours of daily skin-to-skin care

(SSC), where infants are held upright on their parents' bare chest.¹⁷ Skin-to-skin care is a simple yet powerful intervention that reduces neonatal mortality and supports brain development.^{2,4}

Parents of V/EPT infants often feel overwhelmed by the NICU environment and powerless in their caregiving role.^{18–20,48} Mothers, in particular, report anxiety, guilt, and distress from being separated from their newborn, which can hinder bonding and contribute to postpartum depression.^{18–20,26,37} The sight of their infant's fragility and medical equipment can contribute to parental stress and make them hesitant to initiate SSC, despite its known benefits.^{31,50}

To address these challenges, Family-Centered Care (FCC) and Family-Integrated Care models have emerged, emphasizing parental involvement and collaboration with healthcare teams.^{7,33,38} Skin-to-skin care, a core component of FCC, benefits both infants and parents, with mothers reporting reduced anxiety and stronger emotional bonds.^{9,23,27}

Preterm infants in the NICU often undergo 7 to 17 painful procedures daily, exposing them to repetitive pain that can impair neurodevelopment and emotional regulation.^{8,16,51} Untreated pain is associated with altered pain sensitivity, chronic health issues, and lasting cognitive, emotional, and behavioral effects.^{39,42,44}

In the broader context of SSC, is the specific recommended practice of skin-to-skin contact for pain (SSCP) surrounding an acutely painful procedure, such as a heel lance. Organizations, including the Cochrane Review, the Canadian Pain Society, and the American Academy of Pediatrics, describe SSCP as a safe,

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^a York University, Toronto, ON, Canada, ^b Canadian Premature Babies Foundation, Toronto, ON, Canada, ^c Mount Sinai Hospital, Toronto, ON, Canada

*Corresponding author. Address: Department of Psychology, Faculty of Health, Sherman Health Science Research Centre, York University, Room 2006, 4700 Keele St, Toronto, ON M3J 1P3, Canada. Tel.: 416-736-2100 x 20177. E-mail address: rpr@yorku.ca (R. Pillai Riddell).

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nonpharmacological method of neonatal pain management.^{3,24,49} SSCP can dampen infants' pain responses, stabilize heart rate and oxygenation, and offer long-term neuroprotective benefits.^{24,29}

However, SSCP is more difficult with V/EPT infants due to physiological instability and dependency on medical equipment, complicating the logistics of holding them during painful procedures.^{31,50} Although research supports SSCP with preterms broadly²⁴ critical age analyses for V/EPT infants remain limited. Thus, current recommendations for SSCP are being promulgated without clear developmentally attuned evidence for the youngest preterms. Notably, recent studies on V/EPT infants suggest mixed SSCP efficacy.^{11,25}

Moreover, parental perspectives of SSCP for V/EPT infants remain unexplored, despite the heightened stress of the infant's medical fragility.⁴⁵ Watching painful procedures is distressing for most NICU parents, but those with V/EPT infants may experience unique challenges due to the complexities of extreme prematurity and require specialized support.³⁶ Understanding their experiences with SSCP in the NICU is critical to developing interventions that empower parents and optimize pain management for these higher-risk infants. In partnership with a national preterm parent advocacy group, this study explores birthing parents' experiences and perspectives on undertaking SSC and SSCP with their V/EPT infants in the NICU.

2. Methods

2.1. Participants

Recruitment took place from October 2024 to February 2025. Inclusion and exclusion criteria were that birthing parents were able to communicate in English orally (to respond to complex questions in the interview), had a child who was born before 32 weeks, 0 days gestational age during the last 5 years (October 2019–October 2024), and had experienced a NICU stay. Mothers who participated in a previous study at the Mount Sinai NICU in Toronto, Ontario,²² who consented to further contact, were identified using the existing confidential database and were contacted directly through email. In addition, birthing parents of preterm infants with NICU experience across Canada were broadly recruited in collaboration with the Canadian Premature Babies Foundation (CBPF) through flyers, email, and social media posts to participate in a 30-minute interview. Pilot work (in collaboration with the CPBF) suggested that this would be a sufficient time frame. If interested, parents received additional information, and a time was scheduled for an interview.

2.2. Procedure

2.2.1. Ethical considerations

Ethics approval for this study was granted from York University (24-0156-E) and Mount Sinai Hospital (MSH; 24-0156-E). Informed consent was obtained from all participants. All data were deidentified.

Interviews were virtual and conducted using a secure patient health information platform (Zoom teleconferencing PHIPA account) booked for a 60-minute block to allow flexibility for participants who wanted more time. Following introductions and the completion of the electronic consent form using REDCap, interviews were conducted based on the structured interview guide by 3 clinical psychology graduate students (H.H., E.C., N.G.) and 1 research staff with a bachelor's degree in psychology (A.L.). Demographic information was collected at the outset of the

interview followed by a series of questions pertaining to their stay duration and level of involvement in level 3 NICU (most medically intensive care) and level 2 NICU (stepped down care to support development before discharge), and stressors and challenges during their NICU stay using the participant information sheet (PIS) REDCap form. Web-based interviews were recorded using PHIPA-compliant web software (Zoom) and stored on a secure server. Field Notes were taken following each interview to supplement transcripts. All participants were provided with an Amazon e-gift card as a token of appreciation. Standards for Reporting Qualitative Research were followed for this article.³²

2.3. Measures

2.3.1. Interview guide

Using a thematic analysis approach informed by grounded theory principles,^{6,47} the goal of the qualitative interviews was to generate detailed knowledge about birthing parents' experiences and perspectives of engaging in SSC and SSCP in the NICU. The interview guide was developed to address the breadth of experiences and perspectives of birthing parents (see Appendix A: Supplemental Materials, <http://links.lww.com/PAIN/C430>, Interview Guide). The interview guide was developed collaboratively by the lead and senior author (H.H. and R.P.R.), based on pilot interviews conducted by R.P.R. with 7 NICU mothers on SSCP in 2023, whose data were not included in this analysis. Two types of questions were posed in the current interview guide. First, open-ended discourse questions were posed. Then, after participants were able to express their ideas, the interview guide asked specific opinions about concepts related to fears about SSCP and optimal ways to support parents to enact SSCP that were generated from the pilot data. The guide was reviewed and edited based on the feedback from team members with over 25 years of NICU clinical expertise (V.S., C.C., L.J.). The questions were reviewed after the first 3 interviews to assess whether any necessary changes were required based on the participant's comprehension and feedback. Based on the review, no alterations were required. Participants had the opportunity to provide any additional feedback at the end of the interview. Interviews were conducted until saturation was reached.²¹

2.3.2. Participant information sheet

The PIS form includes questions about (1) birthing parent family and household members, (2) interactions with their baby during level 2 and 3 NICU stay, (3) experience with skin-to-skin care with their baby during NICU stay, (4) potential stressors and challenges they have faced related to their infant's NICU stay, and (5) birthing parent and partner's demographic background. Questionnaire responses were used to quantify the socioeconomic status, ethnic background, familial characteristics, NICU experience, and skin-to-skin experience of the sample.

2.4. Data processing

The interview audio-recordings were anonymized and transcribed using transcription software³⁵ and independently double-checked by members of the research team.

2.5. Data analysis

There were 2 analysis leads (H.H. and R.P.R.) who took primary responsibility for developing the code book, overseeing the coding process, and developing themes based on the codes

generated. The codebook was developed during the interview process to understand emerging trends and ascertain saturation. Transcripts were subsequently analyzed using 6 phases of thematic analysis (ie, familiarization, generating codes, identifying themes, reviewing themes, naming themes, and report writing).^{5,6} Data analyses took place from March to May 2025. As a first step, the analysis leads familiarized themselves with the data by reading and making notes on the transcripts. Next, a list of initial codes was generated independently by the analysis leads before a consensus meeting. A consensus meeting was held, where all codes were reviewed and agreed upon, and the codebook and coding form were finalized. Subsequently, 1 analysis lead (H.H.) ran 2 one-hour training sessions with 6 coders (E.C., N.G., A.L., C.C., L.J., V.S.) to familiarize them with the codebook and coding form. All coders (E.C., N.G., A.L., C.C., L.J., V.S.) were members of an interdisciplinary research team (ie, psychology, medicine, nursing) with research and/or clinical background in NICU care. Each transcript was coded twice. The average percent agreement (ie, the number of times 2 individuals agreed upon a code divided by the total number of units of observation that were rated) across transcripts between coders was 0.90 (almost perfect agreement).²⁸ Next, the analysis leads reviewed the coded transcripts and collated codes for each question. The analysis leads met and generated relevant potential themes and thematic maps based on the data (see Appendix B: Supplemental Materials Table 1, <http://links.lww.com/PAIN/C430> [*Open-Ended Questions—Thematic Analysis Results*], Table 2, <http://links.lww.com/PAIN/C430> [*Closed-Ended Questions—Common Fears or Concerns About Holding Very and Extremely Preterm Infant in SSCP*], Table 3, <http://links.lww.com/PAIN/C430> [*Close-Ended Questions—Opinions on 5 Ideas for Supporting SSCP in Very and Extremely Preterm Infants*]). Synthesis of thematic maps follows in the Results section. Summary statistics of all demographic and PIS variables were conducted in SPSS (version 28; IBM Corp, Armonk, New York).

3. Results

3.1. Contextualizing the sample

Participants consisted of 38 self-identified mothers who had a child in the NICU (born V/EPT, less than 32 weeks gestational age). **Table 1** summarizes the demographic characteristics of the mothers, and **Table 2** summarizes the characteristics of their infants' NICU experiences. The majority of mothers were between the ages of 30 and 49, highly educated (84% held at least a university degree), were predominantly North American (66%), employed (58%), and married or living in a common-law relationship (92%). Overall, infants were born at a mean gestational age of 27.60 weeks (SD = 2.81 weeks), with 55% classified as very preterm (28 to <32 weeks) and 45% as extremely preterm (<28 weeks). Most infants were singletons (87%) and received care in Ontario NICUs (53%). Although mothers reported regular presence and moderate involvement in NICU care, SSC and SSCP were more commonly practiced at level 3 NICUs than at level 2, but infants on average also had longer level 3 NICU stays than level 2 NICU stays. Overall, mothers' preparedness⁷ for preterm birth was rated low (M = 33.79 [out of 100]; SD = 35.47).

Furthermore, to better understand the NICU stay challenges of the sample outside of the medical status of their infant (to understand the level of stress on the family), participants were also asked in the demographics form to rate the level of difficulty experienced from each stressor (**Table 3**). Most mothers reported

Table 1
Participant information sheet—demographic characteristics.

Characteristics	N (%)
Self-identified sex of birthing parent	
Male	0 (0%)
Female	38 (100%)
Age	
18-29	3 (8%)
30-49	30 (79%)
Prefer not to answer	5 (13%)
Highest level of education	
Graduate school or professional training	16 (42%)
University graduate (4 y)	16 (42%)
Partial university (at least 1 y)	1 (3%)
Trade school/community college	3 (8%)
High school graduate	2 (5%)
Self-reported ethnicity	
North American	25 (66%)
South Asian	1 (3%)
East Asian	4 (11%)
Southeast Asian	2 (5%)
European	4 (10%)
African	2 (5%)
Household income	
26,000-55,000	1 (3%)
56,000-110,000	5 (13%)
111,000-175,000	16 (42%)
176,000-250,000	6 (16%)
Over 251,000	5 (13%)
Prefer not to answer	5 (13%)
Employment status	
Employed	22 (58%)
Stay-at-home parent	3 (8%)
Parental leave	11 (29%)
Other	1 (3%)
Prefer not to answer	1 (3%)
Relationship status	
Single	2 (5%)
Married/living common law	35 (92%)
Divorced	1 (3%)

N, number.

moderate to high difficulty in several areas during their infant's NICU stay, with mental health challenges, household demands, the cost of parking, physical health challenges, and childcare for other children at home being the most frequently reported as highly difficult. By contrast, challenges related to work demands and caring for other family members were less commonly rated as highly difficult.

3.2. Thematic analysis

Themes were collated to illustrate the breadth of maternal experiences in relation to SSC and then specifically for SSCP. Although the numbers and percentage of mothers who expressed each theme are included below, these figures are not intended to suggest the importance of 1 theme over another. The analysis objectives below describe the diversity and complexity of experiences that V/EPT infant mothers' experiences with SSCP rather than quantify the importance of any theme with statistical certainty. Three sets of syntheses will be provided: the themes from the open-ended questions on SSC and SSCP, the perspectives of the sample on the a priori

Table 2
Participant information sheet—neonatal intensive care unit stay.

Characteristics	M (SD) or N (%)
Infant GA	27.60 (2.81)
Very preterm infant	21 (55%)
Extremely preterm infant	17 (45%)
Multiple birth	
Singleton	33 (87%)
Twin	4 (10%)
Triplet	1 (3%)
NICU location province	
Yukon	1 (3%)
British Columbia	6 (17%)
Alberta	4 (10%)
Manitoba	3 (7%)
Ontario	20 (53%)
Quebec	3 (7%)
Newfoundland	1 (3%)
NICU level 3: presence (d/wk)	6.65 (1.04)
NICU level 3: length of stay (d)	59.47 (51.06)
NICU level 2: presence (d/wk)	6.69 (1.03)
NICU level 2: length of stay (d)	26.30 (21.36)
Level of mothers' involvement in infant's day-to-day care at level 3 NICU (rating from least involved 1-100 most involved)	75.06 (28.67)
Level of mothers' involvement in infant's day-to-day care at level 2 NICU (rating from least involved 1-100 most involved)	77.90 (32.48)
Days before first SSC	6.05 (6.32)
SSCP at level 3 NICU	
Never	15 (39%)
1-5 times	15 (39%)
6-10 times	3 (8%)
11+ times	5 (13%)
Prefer not to answer	0 (0%)
SSCP at level 2 NICU	
Never	17 (45%)
1-5 times	12 (31%)
6-10 times	1 (3%)
11+ times	3 (8%)
Prefer not to answer	5 (13%)
SSC at level 3 NICU	
Never	0 (0%)
1-5 times	6 (17%)
6-10 times	8 (21%)
11+ times	21 (55%)
Prefer not to answer	3 (8%)
SSC at level 2 NICU	
Never	3 (8%)
1-5 times	2 (5%)
6-10 times	3 (8%)
11+ times	24 (63%)
Prefer not to answer	6 (17%)
Lived at home during the infant's level 3 NICU stay	26 (68%)
Lived at home during the infant's level 2 NICU stay	24 (63%)
Level of preparedness for preterm birth (rating from 0 not at all prepared to 100 extremely prepared)	33.79 (35.47)

GA, gestational age; M, mean; N, number; NICU, neonatal intensive care unit; SD, standard deviation; SSC, skin-to-skin care; SSCP, skin-to-skin contact for pain management.

common fears or concerns expressed by the pilot sample, and finally, the perspectives of the sample on the a priori interventions suggested by the pilot sample.

Mothers were first asked about their labour and delivery experiences to contextualize their NICU journey. Participants described a wide range of complications before, during, and after birth, including preterm premature rupture of membranes, high-risk pregnancies, infections (eg, sepsis, pneumonia), gestational diabetes, antepartum hemorrhage, placenta previa, hemolysis elevated liver enzymes and low platelet count syndrome, and extended hospitalizations. Some faced rare conditions such as twin-to-twin transfusion syndrome and twin anemia polycythemia sequence. Some had to travel, sometimes by emergency transport, to access

Table 3
Participant information sheet—reported neonatal intensive care unit stay challenges.

Challenges	Percentage of parents reporting N (%)
Commuting costs	
Low difficulty	22 (58%)
Moderate difficulty	10 (26%)
High difficulty	6 (16%)
Prefer not to answer	0 (0%)
Cost of parking	
Low difficulty	17 (45%)
Moderate difficulty	11 (29%)
High difficulty	10 (26%)
Prefer not to answer	0 (0%)
Childcare of other children at home	
Low difficulty	17 (45%)
Moderate difficulty	6 (16%)
High difficulty	8 (21%)
Prefer not to answer	7 (18%)
Work demands	
Low difficulty	28 (74%)
Moderate difficulty	5 (13%)
High difficulty	1 (3%)
Prefer not to answer	4 (10%)
Household demands	
Low difficulty	15 (39%)
Moderate difficulty	19 (50%)
High difficulty	4 (11%)
Prefer not to answer	0 (0%)
Caring for other family members	
Low difficulty	26 (68%)
Moderate difficulty	6 (16%)
High difficulty	2 (5%)
Prefer not to answer	4 (11%)
Physical health challenges	
Low difficulty	16 (42%)
Moderate difficulty	7 (18%)
High difficulty	12 (32%)
Prefer not to answer	3 (8%)
Mental health challenges	
Low difficulty	5 (13%)
Moderate difficulty	14 (37%)
High difficulty	17 (45%)
Prefer not to answer	2 (5%)

Participants rated how difficult each of the specific challenges was during their infants' NICU stay. Each row represents a specific challenge (eg, commuting costs, work demands, mental health challenges), and responses are categorized by perceived level of difficulty: *low difficulty*, *moderate difficulty*, and *high difficulty*.

NICU, neonatal intensive care unit.

NICU care, leading to separation from family and limited social support. Deliveries were often unplanned, involving emergency C-sections or spontaneous preterm labour, sometimes with significant complications such as major blood loss or amniotic fluid embolism. Postpartum challenges were also common, including pain, mental health difficulties, breastfeeding complications, wound dehiscence, preeclampsia, and prolonged recovery. A few mothers also reported the experience of infant loss and grief. These experiences highlight the complex and often traumatic nature of preterm birth and NICU experience.

4. Themes from open-ended questions

Data from the open-ended questions were synthesized under 8 overarching themes (see Supplemental Table 1, <http://links.lww.com/PAIN/C430>): initial feelings toward SSC in the NICU, feelings toward SSC over time, main feelings toward SSC, experience with SSCP, initial feelings toward SSCP, feelings toward SSCP over time, encouragement for SSCP from others in the NICU, and future suggestions to support SSCP. Italicized quotes from participants are included within themes to help exemplify the content. Summary of the results from the open-ended questions is presented in **Figure 1**.

4.1. Theme 1: Initial feelings toward skin-to-skin care in the neonatal intensive care unit

When mothers were asked about their feelings toward their first-time experience with SSC, both positive and negative emotions were expressed. Overall, 58% (n = 22) of mothers expressed a mix of both positive and negative emotions, while 29% (n = 11) described only negative emotions, and 13% (n = 5) reported only positive emotions toward their first-time experience with SSC.

4.1.1. Subtheme: Positive emotions

Mothers described a range of powerful emotions during their first SSC experience. A large group of mothers expressed deep joy, love, and a sense of bonding, finally feeling like a mom and experiencing SSC as a rewarding and long-anticipated moment, as they had to wait an average of 6.05 days (**Table 2** Participant Information Sheet—NICU Stay) before their first SSC with their baby. Several mothers also felt a profound sense of relief, knowing their baby was safe and stable in their arms, with nurses offering encouragement and support. For several mothers, the experience brought calm and peace, feeling therapeutic and relaxing, while also highlighting the baby’s steady heartbeat and breathing. A small group of mothers felt deep gratitude for being able to hold their baby and for the support from healthcare professionals. A small group of mothers also described the experience as surreal, appreciating its significance of holding their preterm infant.

The skin-to-skin was absolutely amazing. Like I mentioned telling the nurse that it felt like I’m having some therapeutic session

4.1.2. Subtheme: Negative emotions

Mothers described a range of challenging emotions during SSC, with the majority of mothers experiencing fear and anxiety about their baby’s fragile state, medical equipment, and doing SSC correctly. A small group of mothers expressed anger and frustration at medical barriers, hospital policies, and inconsistent guidance from healthcare professionals, as well as sadness over lost bonding opportunities and grief about missing a typical newborn experience. Several mothers felt overwhelmed by the NICU environment and responsibilities, physically uncomfortable

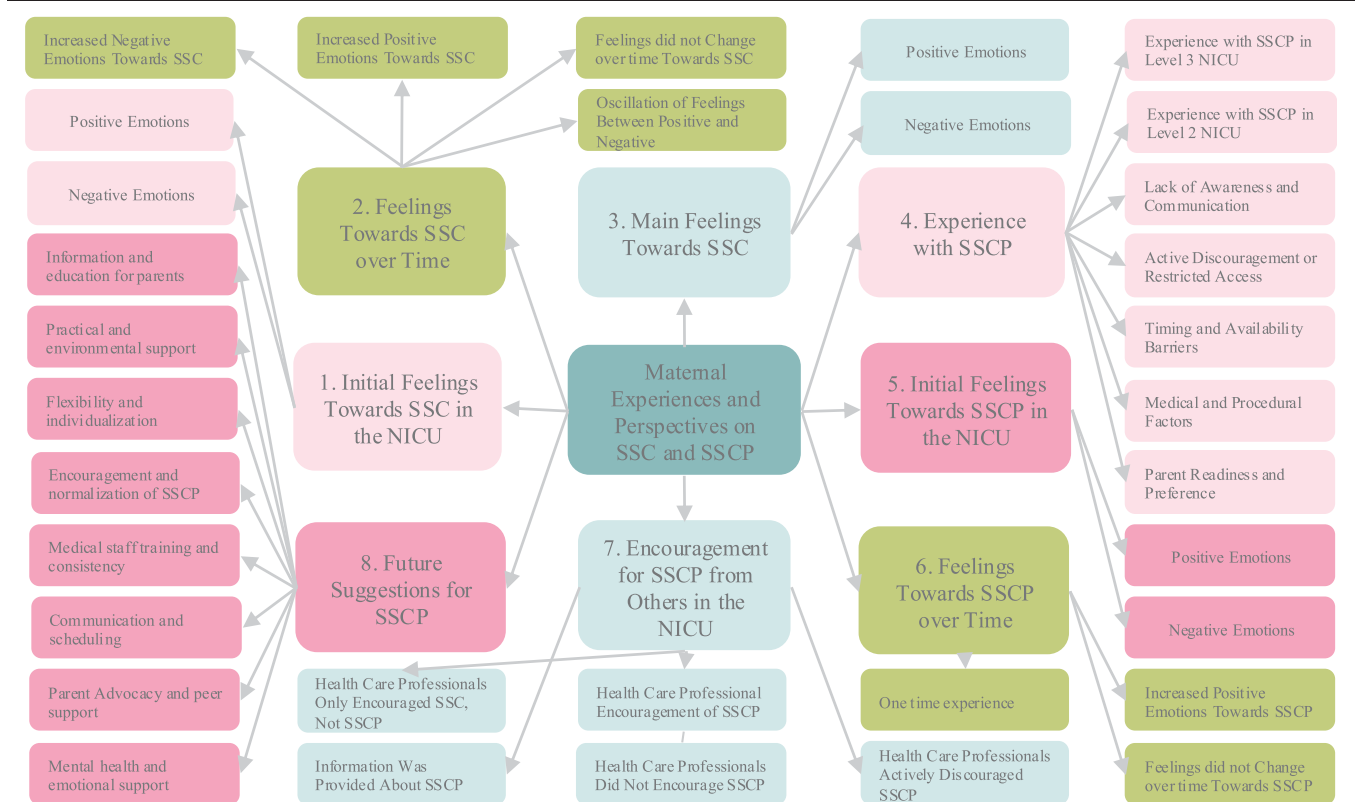


Figure 1. Summary of open-ended questions—thematic analysis results.

during SSC, and daunted by managing the baby's fragile state and medical attachments. A small group of mothers also described feelings of guilt about delayed SSC and about only 1 parent being able to hold the baby first, which added to their emotional burden.

They want you to hold for a minimum of an hour if not more and they were really pushing doing these very long skin-to-skin sessions, I struggled with anxiety in hospitals so for me staying in the hospital and being stuck there for however long they told me to, was really challenging

4.2. Theme 2: Feelings toward skin-to-skin care over time

When mothers were asked about how their feelings toward SSC evolved over the course of their NICU stay, 4 distinct patterns emerged. Many mothers (55%, $n = 21$) described an increase in positive emotions toward SSC over time. Conversely, 13% ($n = 5$) reported an increase in negative emotions. For 23% ($n = 9$) of mothers, their feelings toward SSC remained consistent throughout their NICU stay. Finally, 8% ($n = 3$) described an oscillating trajectory in their emotions, changing emotional valences multiple times over their stay.

4.2.1. Subtheme: Increased positive emotions toward skin-to-skin care

Several mothers described becoming more comfortable and confident with SSC as they practiced it consistently, as they received support from nurses, and as their baby became older and stronger. They felt increasingly eager to engage in SSC, drawn by nurses' encouragement, the calming effect on their baby, and its establishment as a cherished routine. Several mothers expressed that SSC fostered a deeper sense of connection and attunement to their baby's cues, providing mutual comfort and meaningful support. Over time, several mothers came to value SSC even more, recognizing its importance for their baby's health and bonding, making it a priority, and giving them a sense of agency in the NICU.

It just reinforced how important it was to have skin-to-skin every day, whether it was me or my husband, that was the priority every day, to get her on our skin, and that's when she was the most relaxed, most stable. So, it just reinforced how important it was

4.2.2. Subtheme: Increased negative emotions toward skin-to-skin care

A small group of mothers reported increasing negative emotions toward SSC over time, driven by traumatic experiences, such as the baby becoming unstable during SSC, and barriers such as managing SSC alone, lack of nursing support, and COVID-19 restrictions. As their baby's condition worsened, mothers felt helpless and less able to provide comfort. They also described heightened discomfort due to the lack of privacy in the NICU and increased anxiety, especially when their baby became unstable during SSC, intensifying their fear and worry.

I was really cherishing it at first, but then it got to a point where, sometimes I had him skin-to-skin, and the machines kept beeping repeatedly, so it made me nervous, not knowing how to hold him, or if I'm not holding him correctly, and then he's desatting, I felt like I should just maybe let him be in the crib

4.2.3. Subtheme: Feelings did not change over time toward skin-to-skin care

Several mothers described that their feelings toward SSC generally remained positive over time, experiencing happiness, growing attachment, and a sense of contributing to their baby's well-being. They enjoyed observing their baby's development, found SSC supportive of breastfeeding, and appreciated it as a comforting routine, even as it became less frequent. At the same time, a small group of mothers noted that their negative feelings of guilt or overwhelm remained constant throughout their NICU experience.

It just felt like it was the best thing I could do, other than having her inside. Still, it's the next best thing, like the best thing would have been for her to be left inside, but the next best thing was to put her on my chest

4.2.4. Subtheme: Oscillation of feelings between positive and negative

A small group of mothers described their feelings toward SSC changing over time, feeling more comfortable as the baby improved, but then experiencing renewed fear after the baby became unstable and health scares. Some also became comfortable with SSC in level 3 NICU but became less eager to do SSC after moving from level 3 to level 2 NICU.

So, I loved it [...] because she slept so well [...] like she was amazing. [...] Once she turned kind of this gray color, she bradyed really badly, and she kind of stopped breathing. [...] It was really scary for me. After that, I started worrying a lot doing skin-to-skin for probably about a week. I was terrified to hold her. I still did [...] but I was like, oh my God, she's gonna die. Yeah, the evolution was sort of like this, you know, like, oh my God, I love it so much. And then, oh my God, she had an event. And then, oh my God, I love it so much. And then she had an event. Her reaction often coloured the way we felt about it

4.3. Theme 3: Main feelings toward skin-to-skin care

When mothers were asked about the primary emotions they associate with their overall experience of SSC, both positive and negative emotions were expressed. An overwhelming majority of mothers (90%, $n = 34$) described experiencing a mix of both positive and negative emotions, while 10% ($n = 4$) reported only positive emotions throughout their SSC experience in the NICU. Within the categories of positive and negative emotions, additional subtheme clusters emerged, which are detailed below.

4.3.1. Positive emotions

A large group of mothers described SSC overall as a deeply positive experience filled with happiness, joy, warmth, and love, emphasizing the emotional and physical bond with their baby, feeling like a mom, and providing comfort while enjoying the baby's improved health and feeling more connected. Several mothers also reported a sense of security and reassurance, feeling comforted by having their baby close and knowing SSC was beneficial for the baby's health, fostering a sense of fulfillment and belonging. The majority described SSC as comforting and calming, helping them bond, reduce anxiety, and focus on the present moment with their baby, while fostering confidence and

normalcy. A small group described the experience as surreal and awe-inspiring, highlighting their baby's resilience and development. Some mothers expressed gratitude for the opportunity to be present in the NICU, feeling fortunate for family support, and a few mothers expressed hope that SSC was helping their baby, trusting its benefits outweighed any stress from moving the baby.

The actual skin-to-skin was like the only time I felt like I was her mom

4.3.2. Negative emotions

A small group of mothers expressed doubt about SSC overall, questioning its benefits, their technique, and whether it was more for their own comfort than the baby's well-being. Several mothers described guilt during SSC, feeling they burdened nurses, did it incorrectly, prioritized other tasks like pumping, chose between twins, needed medical staff permission, or did not do SSC enough. Several also felt frustrated and overwhelmed by complicated rules, commitment requirements, inconsistent medical staff help, alarms and equipment, uncomfortable chairs, navigating SSC with twins, and COVID-19 restrictions. Several mothers reported discomfort from pain, heat, lack of privacy, masks, breast milk leakage, cords, equipment, and overall fatigue. Most mothers described significant fear and anxiety, worrying about harming the fragile baby, constant monitoring, falling asleep while holding, and future health concerns. Several mothers felt sadness and grief due to the long NICU journey, traumatic birth, longing to take their baby home, and missing the typical birth experience.

I felt guilty about it, I'm doing this because I need it, maybe not necessarily that's the best for you. I know skin-to-skin is great and there are medical benefits but it's hard to wrap your head around that when they're having five bradycardia events when you're holding them, like "is this really best for you right now?"

4.4. Theme 4: Experience with skin-to-skin contact for pain

After broadly discussing SSC, mothers were then asked about their specific experience with SSCP in the NICU. 39% (n = 15) and 45% (n = 17) of mothers reported that they had not participated in SSCP during their infant's stay at level 3 NICU and level 2 NICU, respectively.

Mothers who did not have experience with SSCP described various clusters of reasons and barriers: lack of awareness and communication (53%, n = 20), active discouragement or restricted access (26%, n = 10), timing and availability barriers (24%, n = 9), medical and procedural factors (24%, n = 9), and parent readiness and preference (8%, n = 3).

4.4.1. Subtheme: Lack of awareness and communication

The majority of mothers who did not have experience with SSCP described a lack of awareness and communication about SSCP, with many reporting it was never offered, or they did not know it was an option. Some assumed it was not allowed or appropriate, while others noted that practices varied between hospitals (level 3 and level 2 NICUs), and SSCP for pain was not part of the standard hospital protocol.

It was never an option. Most of the blood draws happened when they were in the incubator. And I guess I never really thought about it. I just assumed they needed it to be on a flat surface

4.4.2. Subtheme: Active discouragement or restricted access

Several mothers who did not have experience with SSCP described experiencing active discouragement or restricted access to SSCP, with some being told not to do SSCP during procedures, others being asked to hold only before or after, and being told that only light contact was allowed, and procedures must be done in the cot as part of the hospital protocol.

I had been trying to like comfort him or distract him during like blood draws and told to like back up or not be in the way and stuff

4.4.3. Subtheme: Timing and availability barriers

Several mothers who did not have experience with SSCP described timing and availability barriers to SSCP, such as procedures scheduled at inconvenient times (eg, during night shift) or happening when they were not present. Some noted that the NICU environment was not set up to accommodate parents during procedures, that there often was not enough space for them to be present during procedures, and that parents sometimes felt excluded or unaware of when painful procedures were happening.

They would sort of hide certain procedures from us. [...] they said the babies cry, we don't want you to see this. Okay, but maybe I do want to be there. Maybe I do want to see this. You know what I mean? [...] I hated that

4.4.4. Subtheme: Medical and procedural factors

Several mothers who did not have experience with SSCP described medical and procedural factors that prevented SSCP during painful procedures, such as the need for the baby to remain still or in the incubator for safety and temperature control. Some were told that SSCP was not possible during certain procedures, like eye examinations or PICC (peripherally inserted central catheter) line insertions, or that only hand hugs, not upright SSCP, were allowed. Nurses reported to parents that they felt uncomfortable supporting SSCP during procedures due to medical or procedural factors.

It's also because of the temperature. So, they need to be in that little incubator to maintain their temperature because when you take them out, they get cold unless they're wrapped in a blanket. So, [we were told by nurses] they can't do procedures like that

4.4.5. Subtheme: Parent readiness and preference

Several mothers who did not have experience with SSCP shared that their own readiness and preference played a role in not doing SSCP during procedures. A few did not want to hold their baby during the procedure, while 1 mother was too scared to ask, which affected their participation in SSCP.

I'm sure it would have helped him if I was holding his hand a little bit. But honestly, I couldn't do it. I couldn't do it. So, I left during the procedures. I actually didn't hold him during any of the hard stuff

4.5. Theme 5: Initial feelings toward skin-to-skin contact for pain

When mothers were asked about their feelings toward their first-time experience with SSCP, both positive and negative emotions were expressed. Overall, 40% (n = 6/15) of mothers with SSCP experience expressed a mix of both positive and negative emotions, while 13% (n = 2/15) described only negative emotions, and 47% (n = 7/15) reported only positive emotions toward their first-time experience with SSCP. Within the categories of positive and negative emotions, additional sub-theme clusters emerged, which are detailed below.

4.5.1. Subtheme: Positive emotions

Several mothers described SSCP during painful procedures as providing calm and comfort for both them and their baby, appreciating their baby's calm response and wanting to be present to comfort them during distress. Several mothers felt relieved due to feeling capable of calming baby during painful procedures, especially with supportive nurses and study staff present, noting that SSCP went smoothly, their baby reacted less to pain, and they felt empowered to help regulate their baby's distress. A small number of mothers expressed curiosity and were intrigued to see how their calming presence during SSCP might affect their baby's reaction to pain.

It made me feel nice because I have an older daughter and when she's hurt hugging her makes her feel better. So, I know I couldn't really help her, I'm not a doctor, but I could hold her [...] I wish I could have held her during every painful procedure she had

4.5.2. Subtheme: Negative emotions

Several mothers described feeling sad during SSCP, especially when seeing their baby's fragility and witnessing their baby in pain. They also described frustration, finding it hard to watch their baby in pain, feeling powerless to help, and feeling that procedures, like taking blood, took too long. In addition, several mothers described fear and anxiety during SSCP, driven by not knowing how their baby would react, feeling inexperienced in consoling their baby, and being overwhelmed by the medical equipment and their baby's fragility.

I felt scared because I didn't know how she was going to react and if she was going to cry. The cry is so small and painful to hear

4.6. Theme 6: Feelings toward skin-to-skin contact for pain over time

When mothers were asked about how their feelings toward SSCP evolved over the course of their NICU experience, 2 distinct patterns emerged. Several mothers with SSCP experience (53%, n = 8/15) described that their feelings toward SSCP remained consistent throughout their NICU stay, while 33% (n = 5/15) reported an increase in positive emotions toward SSCP over time.

4.6.1. Subtheme: Increased positive emotions toward skin-to-skin contact for pain

A small number of mothers described becoming more comfortable and confident with SSCP over time as they gained practice, their

baby grew bigger and stronger, and their baby's condition stabilized. They became more eager to do SSCP after seeing its calming effect on their baby during painful procedures, making it a cherished daily routine, with some motivated by earlier missed opportunities or positive first experiences. A small number of mothers also described feeling more connected with their baby through repeated contact and shared moments, becoming attuned to their baby's pain cues. As they recognized the importance of SSCP for pain management, they started to value it more, appreciating the baby's positive response during procedures and viewing SSCP as a way to communicate and bond with their baby.

I wish I had done it more [...] The only time I was given that opportunity was during a study. I would have done it, for sure, because I did feel a difference in his reaction when I was doing skin-to-skin for that study versus every other time he had a blood draw or something like that

4.6.2. Subtheme: Feelings did not change over time toward skin-to-skin contact for pain

Several mothers described their feelings about SSCP as consistently positive over time, feeling it helped their baby regulate, contributed to their well-being, and provided comfort, with a strong desire to hold their baby during painful procedures and wishing they could do SSCP more often. A small number of mothers consistently felt negatively about SSCP over time, experiencing ongoing stress and guilt when their baby's condition did not improve, finding it painful and sad to watch their baby in pain, and always feeling scared during SSCP. A small number of mothers also reported that their feelings toward SSCP did not change over time, often because they only had 1 opportunity to try SSCP and could not fully evaluate their experience.

I wish that I advocated for it more in the NICU, and told them whenever you're going to take blood, please let me know. I'll make sure I'm there and I'd like to hold him

4.7. Theme 7: Encouragement for skin-to-skin contact for pain from others in the neonatal intensive care unit

When mothers were asked about the level of encouragement they received from others in the NICU regarding the use of SSCP, their responses revealed a range of experiences. Some mothers (21%, n = 8) described receiving encouragement from medical staff to engage in SSCP, while others (26%, n = 10) noted that medical staff only encouraged general SSC but did not encourage SSCP. A larger group (60%, n = 23) reported that medical staff did not encourage SSCP at all, and some mothers (18%, n = 7) even felt that medical staff actively discouraged its use. In addition, a significant number of mothers (79%, n = 30) indicated that they were not provided with any information about SSCP, while a smaller group (21%, n = 8) reported that they did receive information about this practice.

I feel like it was really 50-50. If it was one of our primary nurses, they would always ask. They knew my baby and me very well

4.7.1. Subtheme: Healthcare professional encouragement of skin-to-skin contact for pain

Several mothers described receiving encouragement for SSCP from various sources in the NICU, including nurses and

physicians, though not all medical staff were consistent in their encouragement. A small group of mothers reported that only some nurses or physicians actively promoted SSCP. On occasions, a small number of mothers received encouragement from partners, family members, and research staff to engage in SSCP, supporting its use for pain management.

Their sort of raison d'être is skin-to-skin is what these babies need. So, from day one, we were told this is so important for your children's development, and it helps to minimize the trauma associated with painful procedures

4.7.2. Subtheme: Healthcare professionals only encouraged skin-to-skin care, not skin-to-skin contact for pain

Several mothers described receiving encouragement to practice SSC for their infants' development, with medical professionals emphasizing its benefits and referencing positive factors and programs such as the Newborn Individualized Developmental Care and Assessment Program. However, those professionals did not encourage them to engage in SSCP. Several mothers also noted variability in the level of encouragement they received across different NICU settings, with SSC being more strongly promoted in level 3 NICUs rather than in level 2, and with support varying between individual nurses.

At our level three site, I haven't really seen any child get skin-to-skin for painful procedure just because of the risk of them moving. So, there's giant posters everywhere where you wash your breast pump parts about facilitated tuck they teach you how to cradle your children. So, I would say that maybe not skin to skin was super encouraged during the actual painful procedure itself but certainly the physical contact, parental presence, skin to skin before, skin to skin after a procedure was 100% encouraged

4.7.3. Subtheme: Healthcare professionals did not encourage skin-to-skin contact for pain

Several mothers reported that medical professionals did not mention or promote SSCP, with it only being introduced by research teams, and ward staff generally showing neutrality toward it. Instead, several mothers described being encouraged to use alternative comfort measures, such as holding after the procedure, hand hugging, light touch, or staying in the room to comfort their baby during the procedure. Some staff recommended hand hugging over SSCP. Environmental and practical barriers also prevented SSCP, including procedures scheduled outside parental presence hours, unsuitable NICU setups, and logistical challenges. One mother described COVID-19 restrictions that prevented them from participating in SSCP, while another described medical staff only gradually encouraging SSCP once its benefits for mothers were realized, rather than promoting it from the start.

Didn't seem like it was a big thing. They didn't really mention it too much [...] I probably thought at the time, that's just what they do, there's no purpose of taking him out to hold him while they do that. But I certainly would have liked to have done it

The majority of mothers reported not receiving information about SSCP from medical staff. Instead, they learned about it through research advertisements, their own online research, or social media. Medical staff often shared general information about SSC for bonding or breastfeeding, but not specifically for

pain relief. Some noted stickers for tracking SSC duration, but pain management was rarely discussed.

Oh, I didn't even know that was an option [for pain management] at all in our NICU!

4.7.4. Subtheme: Healthcare professionals actively discouraged skin-to-skin contact for pain

A small number reported being explicitly told not to hold their baby during procedures and to hold them afterward instead. Several mothers described procedural and clinical barriers, including being discouraged or asked to leave the room for invasive or distressing procedures, being told not to watch to avoid seeing their baby in pain, and being discouraged from using SSCP for certain procedures, such as retinopathy of prematurity examinations. Several also reported hospital or institutional barriers, such as SSCP not being standard practice, lack of private rooms to comfortably engage in SSCP, and, on some occasions, staff made parents feel like they were in the way of the procedure. Discrepancies in staff opinions also led to inconsistent support for SSCP.

But if we had a nurse who didn't know [my baby], then no, it wasn't really asked or encouraged. Sometimes they just wanted you out of the way so they could do what they had to do

4.7.5. Subtheme: Information was provided about skin-to-skin contact for pain

Several mothers reported that information about SSCP was provided in the NICU, including pamphlets at admission, posters, websites, and online classes. However, the level of information varied between different NICU levels (more information in level 3 than level 2), and some parents were also referred to Facebook groups to connect with other NICU moms and learned about SSCP from other mothers' experiences.

At one hospital, kangaroo care was more about bonding and keeping the baby happy and build a connection. At the higher-level surgical hospital, they talked more about how it could benefit them during painful procedures

4.8. Theme 8: Future suggestions for skin-to-skin contact for pain

When mothers were asked for suggestions to better support them in SSCP with their preterm infants, they identified a range of needs. A key recommendation was greater encouragement and normalization of SSCP (71%, $n = 27$), by being integrated into routine procedures so that it is expected, encouraged by staff, built into the NICU protocol, and viewed as standard care. Many mothers also highlighted the importance of providing clear information and education about SSCP (66%, $n = 25$). Several mothers emphasized the need for medical staff training in SSCP and consistency of support for the procedure amongst staff (18%, $n = 7$), as unit staff appeared to be varied in their training and even their endorsement of SSCP.

A number of practical and environmental supports to facilitate SSCP (55%, $n = 21$) were offered. A large group of mothers suggested practical and environmental improvements in the NICU to support SSCP, including more comfortable and position-

modifiable chairs to support mothers' and nursing staff's posture, as SSCP during a medical procedure can be awkward.

Flexibility and individualization of care (24%, $n = 9$) were also seen as critical to accommodate SSCP. For example, improving communication and scheduling with parents about the timing of skin-to-skin (37%, $n = 14$) to coordinate SSCP for routine procedures. A few mothers (8%, $n = 3$) called for stronger parent advocacy and peer support, and some (8%, $n = 3$) highlighted the need for mental health and emotional support to help support and calm them so they can calm their babies better during SSCP. A number of important suggestions came up in regards to cultural differences in how to support SSCP. A few mothers discussed modesty concerns and the need in open rooms to have privacy screens for comfort and modesty. They also recommended offering information and resources about SSCP in various formats and languages, as well as optional NICU classes on SSCP for parents to attend.

There were so many mothers whose language is not English, so even having another nurse who, maybe speaks their language to explain that to those families

Finally, a small number of mothers suggested fostering parent advocacy and peer support by empowering parents to contribute to their baby's care, connecting them with NICU family community support or parent advocates from their own NICU, recognizing that experiences can vary greatly depending on the hospital and level, and creating common spaces within the NICU where parents can meet and connect outside the bedside.

I truly believe that the most helpful thing would be having a former parent of that unit as a parent advocate on either volunteer or staff position to speak to the other parents [...] even if it was just, once a week, or once a month, a group session to see this person, or if they were somebody, you could message [...] A doctor can tell you whatever, a nurse practitioner can tell you whatever, but, hearing it from another parent who, lived the same way that you're living it is just so different

5. Closed-ended questions—perspectives on 5 ideas for supporting skin-to-skin contact for pain in very and extremely preterm infants

In addition to the open-ended questions, parents were asked approximately 5 potential interventions to support SSCP with V/EPT infants in NICUs (generated from pilot work undertaken prestudy) (see Supplemental Table 3, <http://links.lww.com/PAIN/C430>). These interventions were having medical staff openly talk about common fears mothers hold about SSCP before it is attempted, having a cheat sheet or how-to card to address how to manage parental stress during SSCP displayed around the baby's cot, calmly talking about "what if" scenarios if their child's medical equipment became disconnected during SSCP, enacting a graduated introduction to SSCP with less-intensive parent-led procedures, and teaching parents to relax before SSCP so that the baby can be more relaxed during the painful procedure. Mothers were asked whether these interventions would be helpful or not helpful for them. Please note, some mothers described how a single intervention could be both helpful and unhelpful, depending on contextual factors. Their reasoning is further organized into themes, with descriptions provided in Supplemental Table 3, <http://links.lww.com/PAIN/C430>. This is also why the percentages reported below do not total 100%.

Overall, mothers responded positively to the proposed interventions to support SSCP, though individual variability was clear. The most strongly endorsed intervention was having medical staff talk about common fears mothers hold about SSCP before it is attempted, which 89% of mothers found helpful, while 16% felt it was not helpful. Similarly, calmly discussing "what if" scenarios, such as accidental disconnection of medical equipment, was considered to be helpful by 79% of mothers, though 34% reported it as not helpful.

I think the hardest thing for me has been when something unexpected happens during skin-to-skin, because that is what really catches me off guard and stresses me out in the moment. And I think, like, why is this happening? What are they doing? What's going on?

Providing a cheat sheet or tip card to address how to manage parental stress during SSCP was also well received, with 82% of mothers thinking it would be helpful and 37% noting it as not helpful. Fewer mothers endorsed the usefulness of graduated introduction to SSCP with less-intensive parent-led procedures, with 66% finding it helpful and 50% reporting it as not helpful.

I feel for myself, I would probably want to just jump right in because just watch and not be able to intervene in any way, even to go in and do the hand hugging, I feel would be maybe even tougher to do. I feel it would depend on the personal preference, so maybe giving them those as options for their comfort, but also being allowed to jump those first steps

Teaching parents' relaxation strategies before SSCP was also considered helpful by 66% of mothers, but 42% still felt it was not helpful. The responses overall suggested that while mothers generally appreciate supportive interventions, individual preferences and perceived relevance can vary and must be considered.

6. Closed-ended questions—common fears or concerns about holding very and extremely preterm infants in skin-to-skin contact for pain

Mothers were then asked to opine approximately 5 fears or concerns related to SSCP that were generated through pilot data to see whether they resonated with a larger sample of mothers (medical fragility of infant impairing SSCP, fear of disrupting infant's medical equipment, not wanting to be associated with pain, fear of SSCP due to a failed attempt at SSC or SSCP, feeling their lack of experience precluded SSCP) (see Supplemental Table 2, <http://links.lww.com/PAIN/C430>). Mothers were asked whether they felt these concerns not at all, somewhat, or very much.

In terms of medical fragility impacting their ability to do SSCP for pain, approximately 76% of mothers did not agree with that feeling entirely or in part, with approximately 24% of mothers feeling that this was very much how they felt. Regarding the fear of disrupting medical equipment, approximately 66% of mothers did not identify with that concern entirely or in part, with approximately 34% of mothers very much feeling that this was how they felt. In terms of not wanting to be associated with pain, 92% of mothers did not endorse that feeling entirely or in part, with 8% of mothers very much endorsing this fear. In regards to being afraid of SSCP due to a failed attempt at SSC or SSCP, 87% of mothers did not identify with that feeling entirely or in part, with approximately 13% of mothers very much endorsing that fear. Finally, regarding feeling their lack of experience precluded SSCP, 84% of mothers did not feel that their lack of experience

precluded participation in SSCP, while 16% of mothers reported feeling that this was very much how they felt. This suggests more extreme feelings of fear and anxiety are not experienced by the majority of mothers in our samples but appear to reflect an important minority of approximately 8% to 34%.

7. Discussion

We explored mothers' experiences with SSC and SSCP in the NICU with their V/EPT infants, revealing a multifaceted and deeply emotional process shaped by both positive and negative experiences. Mothers described profound feelings of joy, love, and connection with their babies, viewing SSC and SSCP as a crucial bonding experience that made them feel like mothers, that it was the most normal they felt in the NICU, despite how unnatural the NICU experience felt. These findings build on a growing literature documenting parents' emotional experiences with SSCP in the NICU. These findings align with literature showing that SSC enhances parents' emotional bonding with infants and fosters parental empowerment and confidence.^{30,36} Consistent with our findings, systemic and logistical barriers, such as rigid hospital protocols, limited parental presence hours, and restricted access to neonatal units, often hinder SSC practices.^{13,46} These barriers are often rooted not in survival-based limitations, as seen in low-resource settings, but in institutional priorities that favour medical technology and strict protocols over relational caregiving.³⁶ Emotional and physical hardships, including fatigue, muscle strain, and sleep deprivation, particularly during prolonged SSC sessions, were commonly reported.^{10,36} Parents described emotional fatigue from the pressure to provide extended and uninterrupted care, and navigating unfamiliar medical environments.^{1,12} Despite these challenges, repeated SSC experiences were found to build confidence, reduced anxiety, and reaffirming parental commitment to their infant's well-being even at personal cost.^{10,36}

Taken together, these insights align with existing literature on the complex emotional experiences of mothers engaging in SSC. Our study extends this knowledge by highlighting the specific psychological and systemic barriers faced by parents of V/EPT infants, specifically engaging in SSCP. Although the benefits of SSCP have been broadly promulgated,⁴⁴ critical gaps remain in understanding the evidence base supporting SSCP and the emotional complexities of parents' experiences during SSCP, particularly when their child is born V/EPT. The current findings underscore the urgent need for trauma-informed, family-centered approaches that validate parental emotions and proactively address medical professionals' perspectives on SSCP.⁴

Mothers described a sense of relief at being able to support their infant during painful procedures and a feeling of calm and comfort from seeing how soothing SSCP was for their baby. As they engaged in SSCP over time, many mothers reported becoming more comfortable and confident, highlighting the role of practice, supportive staff, and their baby's improving health. However, the findings also underscored significant challenges, including fear of harming their fragile infant, overwhelming environmental and procedural barriers, inconsistent encouragement from medical staff, and profound feelings of guilt and anxiety. Importantly, this study provides rich data on the realities of SSCP in NICUs and clear recommendations for future SSCP practice, including consistent staff training and encouragement, improved communication about infants' procedures, individualized support, and integrated mental health resources for families.

Mothers' experiences revealed that inconsistent messaging from medical staff, hospital policies, and clinical factors (eg, medical instability, equipment, NICU environment layout) often acted as barriers to effective SSCP. The inconsistency in staff encouragement, particularly across NICU levels, was a significant source of confusion. One quarter of parents reported that they were actively discouraged from participating in SSCP with their very or extremely preterm-born infant, and more than half had no knowledge that SSCP was a possibility. Overall, 45% and 39% of our sample had no experience with SSCP at all during their infants' level 2 and level 3 NICU stay, respectively. These findings echo those of Coutts et al. (2021), who identified similar barriers to SSC in Canadian NICUs, including inconsistent staff practices and attitudes, and environmental constraints. Their conclusion that no "one size fits all" approach is effective underscores the need for context-specific strategies to normalize SSCP and support parent-infant contact.¹⁵ However, in contrast to SSC, SSCP adds an additional layer of complexity and limitation, as it requires nurses to be comfortable performing medical procedures while the infant is in a skin-to-skin position. In these cases, staff hesitation may stem not only from institutional norms but also from legitimate concerns about risk of injury to the infant due to the physical and biomechanical demands of conducting procedures in SSCP.

Conversely, mothers felt empowered when medical staff provided clear guidance, emotional reassurance, and practical assistance during SSC, highlighting the critical role of medical professionals in shaping parents' experiences. Importantly, the emotional readiness of mothers, their past experiences, and the baby's medical stability were key factors influencing their ability to engage in SSCP effectively. Environmental factors, such as comfortable chairs, increased privacy, and flexible scheduling, emerged as practical yet often overlooked facilitators of SSC and SSCP.

Finally, several strong emotions and fears were generated in this study that require attention and intervention. It appears there is a notable minority of study mothers who have more extreme fears and anxiety that should be addressed. Mothers of V/EPT infants often face a longer and more challenging journey with an infant who is more medically fragile. One quarter of mothers believed their infant was too fragile for SSCP, and one-third of mothers lived with constant fear of disrupting their baby's medical equipment.

7.1. Implications for practice and policy

The findings underscore the need for NICUs to adopt consistent, parent-centered approaches that prioritize both the emotional and practical needs of families. Training programs for medical and nursing staff should emphasize the benefits of SSCP for pain management and include education on which painful procedures can be performed during SSCP, communication skills, and empathy, ensuring consistent messaging and support. Neonatal intensive care unit policies should be designed to facilitate SSC and SSCP integration into routine care. This includes environmental adjustments (eg, comfortable seating, privacy screens), ergonomic support for the clinician performing painful procedures during SSCP (as appropriate for each procedure), and active communication with parents regarding their infant's procedure schedules and scheduling flexibility to accommodate parents' presence. Moreover, integrating mental health resources, such as counseling and peer support, can help parents navigate the emotional complexities and social isolation of caring for a NICU child and engaging in SSCP, enhancing their confidence and participation. A small minority of parents had notable fears about

disconnecting their infant's medical equipment or that their baby was too fragile for SSCP. This is an area where medical staff can preemptively dialogue with parents about their fears and allow frank conversations to help manage parental misconceptions that can add even more anxiety to their already highly stressful NICU experience. Calmer, more regulated parents will help to support calmer, more regulated babies.

7.2. Limitations and future directions

Several limitations should be considered when interpreting the findings of this study. The sample was limited in its linguistic diversity, as only English-speaking parents were recruited, most of whom identified as Canadian-born. This limits the transferability of findings to more culturally diverse populations, especially given known disparities in neonatal care access and outcomes. Parents in this study were also highly educated, which may not reflect the experiences of those with lower educational attainment—a group also at increased risk for preterm birth. The voluntary nature of participation introduces the possibility of selection bias, as parents who felt strongly about their NICU experience or were more engaged may have been more likely to participate. Although our study attempted sex neutral recruitment (ie, birthing parents' perspectives), only cisgender mothers responded to our recruitment call. This leaves the experiences of fathers and trans-mothers/birthing parents unexplored. Our study included participants whose NICU experience occurred within the past 5 years. As with all retrospective studies, recall bias will influence maternal perceptions of their time in the NICU. However, understanding their current perceptions, after the intense in situ distress and trauma of that period has passed, is an important perspective for understanding NICU pain management and care broadly. Finally, it is important to acknowledge that the COVID-19 pandemic may have shaped parental experiences of SSC and SSCP due to evolving parental presence restrictions and infection control measures in NICUs during that time.

8. Conclusion

This study highlights the complex emotional experiences and perspectives of mothers engaging in SSCP in the NICU. Although many described SSCP as a rewarding and comforting practice that deepened their bond with their baby by empowering them to manage their infant's distress, significant barriers were also noted. This study opens a dialogue on maternal negative feelings and experiences of SSCP to give voice to the broad range of experiences. Acknowledging that there is this diversity with parents may help them feel less isolated in these feelings. Addressing systemic barriers through staff training, consistent unit-wide training and support for SSCP, flexible family-centred policies, and mental health support is essential to empower parents to participate meaningfully in their baby's care. Future research should clarify the evidence base for SSCP in V/EPT babies to better understand the discouragement (actively or passively) by medical staff of SSCP that was alluded to by many parents. Moreover, this study provides novel parent-ideated interventions that could improve SSCP experiences for parents of V/EPT infants. Ultimately, by integrating parents as partners in the NICU, healthcare systems can foster positive experiences that promote infant and parent health in V/EPT infant populations.

Conflict of interest statement

The authors have no conflict of interest to declare.

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Supplemental digital content

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References

- [1] Anderzén-Carlsson A, Lamy ZC, Eriksson M. Parental experiences of providing skin-to-skin care to their newborn infant—part 1: a qualitative systematic review. *Int J Qual Stud Health Well Being* 2014;9:24906.
- [2] Artese C, Ferrari F, Perugi S, Cavicchioli P, Paterlini G, Mosca F, Bertocelli N, Chiandotto V, Strolo P, Simeoni N, Calciolari G, Colombo G, Rovei S, Arenga I, Arpi E, Montiroso R. Surveying family access: Kangaroo mother care and breastfeeding policies across NICUs in Italy. *Ital J Pediatr* 2021;47:231.
- [3] Baley J, Watterberg K, Cummings J, Eichenwald E, Poindexter B, Stewart DL, Aucott SW, Puopolo KM, Goldsmith JP. Skin-to-skin care for term and preterm infants in the neonatal ICU. *Pediatrics* 2015;136:596–9.
- [4] Beaumont L, Mullaney D, Eklund W, DeGrazia M. Kangaroo care in the neonatal intensive care unit—A practice change initiative. *Adv Neonatal Care* 2025;25:129–37.
- [5] Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol* 2006;3:77–101.
- [6] Braun V, Clarke V. 18 approaches to thematic analysis. *Starting Res Clin Educ* 2023;8:165–74.
- [7] Broom M, Parsons G, Carlisle H, Kecskes Z, Thibeau S. Exploring parental and staff perceptions of the family-integrated care model. *Adv Neonatal Care* 2017;17:E12–9.
- [8] Bueno M, Rao M, Aujla P, Victor C, Stevens B. A scoping review of the epidemiology and treatment of painful procedures in hospitalized neonates: what has changed in the past three decades? *Eur J Pain* 2024;28:1468–85.
- [9] Buil A, Caeymaex L, Mero S, Sankey C, Apter G, Devouche E. Kangaroo supported diagonal flexion positioning: positive impact on maternal stress and postpartum depression risk and on skin-to-skin practice with very preterm infants. *J Neonatal Nurs* 2019;25:86–92.
- [10] Cai Q, Chen DQ, Wang H, Zhang Y, Yang R, Xu WL, Xu XF. What influences the implementation of Kangaroo mother care? An umbrella review. *BMC Pregnancy Childbirth* 2022;22:851.
- [11] Campbell-Yeo M, Johnston CC, Benoit B, Disher T, Caddell K, Vincer M, Walker CD, Latimer M, Streiner DL, Inglis D. Sustained efficacy of kangaroo care for repeated painful procedures over neonatal intensive care unit hospitalization: a single-blind randomized controlled trial. *PAIN* 2019;160:2580–8.
- [12] Cattaneo A, Amani A, Charpak N, De Leon-Mendoza S, Moxon S, Nimbalkar S, Tamburlini G, Villegas J, Bergh AM. Report on an international workshop on Kangaroo mother care: lessons learned and a vision for the future. *BMC Pregnancy Childbirth* 2018;18:170.
- [13] Chan GJ, Labar AS, Wall S, Atun R. Kangaroo mother care: a systematic review of barriers and enablers. *Bull World Health Organ* 2015;94:130–41.
- [14] Chawanpaiboon S, Vogel JP, Moller A-B, Lumbiganon P, Petzold M, Hogan D, Landoulsi S, Jampathong N, Kongwattanakul K, Laopaiboon M, Lewis C, Rattanakanokchai S, Teng DN, Thinkhamrop J, Watananirun K, Zhang J, Zhou W, Gülmezoglu AM. Global, regional, and national estimates of levels of preterm birth in 2014: a systematic review and modelling analysis. *Lancet Glob Health* 2019;7:e37–46.
- [15] Coutts S, Woldring A, Pederson A, De Salaberry J, Osiovič H, Brotto LA. What is stopping us? An implementation science study of kangaroo care

- in British Columbia's neonatal intensive care units. *BMC Pregnancy Childbirth* 2021;21:52.
- [16] Cruz M, Fernandes A, Oliveira C. Epidemiology of painful procedures performed in neonates: a systematic review of observational studies. *Eur J Pain* 2015;20:489–98.
- [17] Darmstadt G, Kirkwood B, Gupta S, WHO Strategic and Technical Advisory Group of Experts for Maternal, Newborn, Child, and Adolescent Health and Nutrition KMC Working Group. WHO global position paper and implementation strategy on Kangaroo mother care call for fundamental reorganization of maternal-infant care. *Lancet* 2023;401:1751–3.
- [18] Dressler C. The psychological implications of having an infant in the NICU for mothers and fathers. *J Neonatal Nurs* 2024;30:467–9.
- [19] Feeley N, Zolkowitz P, Cormier C, Charbonneau L, Lacroix A, Papageorgiou A. Posttraumatic stress among mothers of very low birthweight infants at 6 months after discharge from the neonatal intensive care unit. *Appl Nurs Res* 2011;24:114–7.
- [20] Fróes GF, Mendes ENW, Pedroza GdA, Cunha MLcd. Stress experienced by mothers of preterm newborns in a neonatal intensive care unit. *Rev Gaúcha Enfermagem* 2020;41:e20190145.
- [21] Guest G, Bunce A, Johnson L. How many interviews are enough? *Field Methods* 2006;18:59–82.
- [22] Hamwi L, Du H, Jasim S, Wang X, Cheng C, Shah V, Fabrizio L, Fitzgerald M, Meek J, Racine N, Stedman I, Pillai Riddell R. Machine learning classification of EEG responses to pain vs non-pain related stimuli in preterm infants. *Pain Rep* 2025;10:e1332.
- [23] Herizchi S, Hosseini MB, Ghoreishizadeh M. The impact of Kangaroo-mother care on postpartum depression in mothers of premature infants. *Int J Women Health Reprod Sci* 2017;5:312–7.
- [24] Johnston C, Campbell-Yeo M, Disher T, Benoit B, Fernandes A, Streiner D, Inglis D, Zee R. Skin-to-skin care for procedural pain in neonates. *Cochrane Database Syst Rev* 2017;2. doi: 10.1002/14651858.CD008435.pub3
- [25] Kristoffersen L, Støen R, Bergseng H, Follestad T, Theodorsson E, Vederhusen B, Adde L, Austeng D. Skin-to-skin contact during eye examination did not reduce pain compared to standard care with parental support in preterm infants. *Acta Paediatr* 2019;108:1434–40.
- [26] Lee C, Huang X. Psychological processes of postpartum mothers with newborns admitted to the intensive care unit. *Asian Nurs Res* 2022;16:9–17.
- [27] Lee J. Neonatal family-centered care: evidence and practice models. *Clin Exp Pediatr* 2024;67:171–7.
- [28] McHugh ML. Interrater reliability: the kappa statistic. *Biochemia Med* 2012;22:276–82.
- [29] Molloy EJ, El-Dib M, Soul J, Juul S, Gunn AJ, Bender M, Gonzalez F, Bearer C, Wu Y, Robertson NJ, Cotton M, Branagan A, Hurley T, Tan S, Laptook A, Austin T, Mohammad K, Rogers E, Luyt K, Wintermark P, Bonifacio SL, Bonifacio SL, Wintermark P, Aly H, Chau V, Glass H, Lemmon M, Wusthoff C, deVeber G, Pardo A, Carrasco M, Boardman J, Gano D, Peeples E, Peeples E. Neuroprotective therapies in the NICU in preterm infants: present and future (Neonatal Neurocritical Care Series). *Pediatr Res* 2023;95:1224–36.
- [30] Mu PF, Lee M, Chen Y, Yang H, Yang S. Experiences of parents providing Kangaroo care to a premature infant: a qualitative systematic review. *Nurs Health Sci* 2019;22:149–61.
- [31] Ncube RK, Barlow H, Mayers PM. A life uncertain-Mybaby's vulnerability: mothers' lived experience of connection with their preterm infants in a Botswana neonatal intensive careunit. *Curationis* 2016;39:1–9.
- [32] O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research. *Acad Med* 2014;89:1245–51.
- [33] O'Brien K, Robson K, Bracht M, Cruz M, Lui K, Alvaro R, Da Silva O, Monterrosa L, Narvey M, Ng E, Soraisham A, Ye XY, Mirea L, Tarnow-Mordi W, Lee SK, O'Brien K, Lee S, Bracht M, Caouette G, Ng E, McMillan D, Ly L, Dow K, Taylor R, Monterrosa L, Canning R, Sankaran K, Bingham W, Soraisham A, el Helos S, Alvaro R, Narvey M, da Silva O, Osiovich H, Emberley J, Catelin C, Aubin St. L, Warkentin T, Kalapesi Z, Bodani J, Lui K, Kho G, Kecskes Z, Stack J, Schmidt P, Paradisis M, Broadbent R, Raiman C, Wong C, Cabot M, L'Herauld M, Gignac MA, Marquis MH, Leblanc M, Travell C, Furlong M, Van Bergen A, Ottenhof M, Keron H, Bowley C, Cross S, Kozinka G, Cobham-Richards V, Northrup K, Gilbert-Rogers C, Pidgeon P, McDuff K, Leger N, Thiel C, Willard S, Ma E, Kostecky L, Pogorzelski D, Jacob S, Kwiatkowski K, Cook V, Granke N, Geoghegan-Morphet N, Bowell H, Claydon J, Tucker N, Lemaitre T, Doyon M, Ryan C, Sheils J, Sibbons E, Feary AM, Callander I, Richard R, Orbeso J, Broom M, Fox A, Seuseu J, Hourigan J, Schaeffer C, Mantha G, Lataigne M, Robson K, Whitehead L, Skinner N, Visconti R, Crosland D, Griffin K, Griffin B, Collins L, Meyer K, Silver I, Burnham B, Freeman R, Muralit K, Ramsay C, McGrath P, Munroe M, Hales D, Skinner N. Effectiveness of Family Integrated Care in neonatal intensive care units on infant and parent outcomes: a multicentre, multinational, cluster-randomised controlled trial. *Lancet Child Adolesc Health* 2018;2:245–54.
- [34] Ohuma EO, Moller A, Bradley E, Chakwera S, Hussain-Alkhateeb L, Lewin A, Okwaraji YB, Mahanani WR, Johansson EW, Lavin T, Fernandez DE, Domínguez GG, De Costa A, Cresswell JA, Krasevec J, Lawn JE, Blencowe H, Requejo J, Moran AC. National, regional, and global estimates of preterm birth in 2020, with trends from 2010: a systematic analysis. *Lancet* 2023;402:1261–71.
- [35] Otter.ai. Otter [Computer software] 2025. Otter.ai, Inc. Available at: <https://otter.ai>. Accessed March 11, 2025.
- [36] Phuwayanon S, Healy M, Boyle B. Diverse parental experiences of kangaroo care in neonatal units across healthcare systems: a meta-synthesis. *J Adv Nurs* 2025. doi: 10.1111/jan.17058
- [37] Poehlmann J, Schwichtenberg AM, Bolt D, Dilworth-Bart J. Predictors of depressive symptom trajectories in mothers of preterm or low birth weight infants. *J Fam Psychol* 2009;23:690–704.
- [38] Ramezani T, Shirazi ZH, Sarvestani RS, Moattari M. Family-centered care in neonatal intensive care unit: a concept analysis. *Int J Commun Based Nurs Midwifery* 2014;2:268–78.
- [39] Ranger M, Zwicker JG, Chau CM, Park MT, Chakravarthy MM, Poskitt K, Miller SP, Bjornson BH, Tam E, Chau V, Synnes AR, Grunau RE. Neonatal pain and infection relate to smaller cerebellum in very preterm children at school age. *J Pediatr* 2015;167:292–8.e1.
- [40] Rios JD, Shah PS, Beltempo M, Louis D, Mukerji A, Premji S, Shah V, Lee SK, Pechlivanoglou P, Abenhaim H, Affi J, Alvaro R, Andrews J, Armon A, Audibert F, Aziz K, Ballantyne M, Barrett J, Berard A, Bertelle V, Blais L, Bocking A, Bodani J, Burrows J, Butt K, Canning R, Carson G, Chaillet N, Chandra S, Church P, Cieslak Z, Crane J, Creighton D, Da Silva O, Daboval T, Dahlgren L, Daspal S, de Cabo C, Deshpandey A, Dow K, Drolet C, Dunn M, Salhab el H, El-Chaar D, El-Naggar W, Fajardo C, Gagnon R, Gratton R, Han V, Harrison A, Hasan S, Helewa M, Hicks M, Joseph K, Kajetanowicz A, Kalapesi Z, Khairy M, Lacaze-Masmonteil T, Lee KS, Lemyre B, Lodha A, Mai Luu T, Ly L, Majnemer A, Makary H, Marc I, Masse E, McDonald SD, McMillan D, Melamed N, Metcalfe A, Moddemann D, Monterrosa L, Morais M, Mundle W, Murphy L, Murphy K, Nuyt AM, Nwaesei C, O'Brien K, Offringa M, Ojah C, Ouellet A, Pasquier JC, Pelousa E, Piedboeuf B, Portales-Casamar E, Puliganlla P, Pullenayegum E, Reichert A, Robson K, Schneider C, Seshia M, Shah PS, Sherlock R, Shivananda S, Singhal N, Skarsgard E, Skoll A, Smith G, Synnes A, Thériault K, Ting J, Tough S, Toye J, Ubhi J, Vincer M, Whittle W, Whyte H, Wilson D, Wood S, Ye P, Yee W, Zwicker J, Jaideep K, Ting J, Cieslak Z, Sherlock R, Mehrem AA, Toye J, Fajardo C, Kalapesi Z, Bodani J, Sankaran K, Daspal S, Seshia M, Alvaro R, Da Silva O, Adie M, Lee KS, Dunn M, Lemyre B, Khurshid F, Pelousa E, Barrington K, Lapointe A, Ethier G, Drolet C, Piedboeuf B, Claveau M, Bertelle V, Masle E, Canning R, Makary H, Ojah C, Monterrosa L, Emberley J, Affi J, Kajetanowicz A, Kajetanowicz A. Costs of neonatal intensive care for Canadian infants with preterm birth. *J Pediatr* 2021;229:161–7.e12.
- [41] Rolnitsky A, Unger SL, Urbach DR, Bell CM. Cost of neonatal intensive care for extremely preterm infants in Canada. *Translat Pediatr* 2021;10:1630–6.
- [42] Schneider J, Duerden EG, Guo T, Ng K, Hagmann P, Bickle Graz M, Grunau RE, Chakravarty MM, Huppi PS, Truttman AC, Miller SP. Procedural pain and oral glucose in preterm neonates: brain development and sex-specific effects. *PAIN* 2018;159:515–25.
- [43] Shah PS, McDonald SD, Barrett J, Synnes A, Robson K, Foster J, Pasquier JC, Joseph KS, Piedboeuf B, Lacaze-Masmonteil T, O'Brien K, Shivananda S, Chaillet N, Pechlivanoglou P. The Canadian preterm birth network: A study protocol for improving outcomes for preterm infants and their families. *CMAJ Open* 2018;6:E44–9.
- [44] Shiff I, Buceasa O, Pillai Riddell R. Psychosocial and neurobiological vulnerabilities of the hospitalized preterm infant and relevant non-pharmacological pain mitigation strategies. *Front Pediatr* 2021;9:568755.
- [45] Stoll BJ, Hansen NI, Bell EF, Shankaran S, Laptook AR, Walsh MC, Hale EC, Newman NS, Schibler K, Carlo WA, Kennedy KA, Poindexter BB, Finer NN, Ehrenkranz RA, Duara S, Sánchez PJ, O'Shea TM, Goldberg RN, Van Meurs KP, Faix RG, Phelps DL, Frantz ID III, Watterberg KL, Saha S, Das A, Higgins RD. Neonatal outcomes of extremely preterm infants from the NICHD neonatal research network. *Pediatrics* 2010;126:443–56.
- [46] Suitor C. Kangaroo mother care: a literature review of barriers and facilitators to implementation in the neonatal intensive care unit. *J Neonatal Nurs* 2023;29:245–52.
- [47] Tie YC, Birks M, Francis K. Grounded theory research: A design framework for novice researchers. *SAGE Open Med.* 2019;7:1–7. doi: 10.1177/2050312118822927.

- [48] Torbert N, Taladay C, Kauer T, Hackenburg L, Weaver MS, Kellas JK. Providing “Compassionate care” in the neonatal intensive care unit through infant and family needs-based care. *Am J Perinatol* 2022;41:e863–9.
- [49] Trottier ED, Dore-Bergeron M-J, Chauvin-Kimoff L, Baerg K, Ali S. Managing pain and distress in children undergoing brief diagnostic and therapeutic procedures. *Paediatrics Child Health* 2019;24:509–21.
- [50] Valizadeh L, Zamanzadeh V, Rahiminia E. Comparison of anticipatory grief reaction between fathers and mothers of pre-mature infants in neonatal intensive care unit. *Scand J Caring Sci* 2013;27:921–6.
- [51] Vinall J, Grunau RE. Impact of repeated procedural pain-related stress in infants born very preterm. *Pediatr Res* 2014;75:584–7.
- [52] Woodward LJ, Moor S, Hood KM, Champion PR, Foster-Cohen S, Inder TE, Austin NC. Very preterm children show impairments across multiple neurodevelopmental domains by age 4 years. *Arch Dis Child Fetal Neonatal Ed* 2009;94:339–44.