

From Expressing Human Milk to Breastfeeding—An Essential Element in the Journey to Motherhood of Mothers of Prematurely Born Infants

Anne Brødsgaard, PhD, MPH, RN; Bente Lund Andersen, MPQM, RN;
Diana Skaaning, PhD, MAEdSoc, RN; Mette Petersen, MPH, RN

ABSTRACT

Background: Lactation and breastfeeding present an extraordinary challenge for mothers of prematurely born infants.

Purpose: To explore the significance of and the circumstances that affect lactation for mothers of premature infants.

Methods: A qualitative exploratory study based on single, in-depth, semistructured interviews with 16 purposefully sampled mothers of premature infants admitted to the neonatal intensive care unit (NICU). Data were analyzed using content analysis. The study was reported according to Standards for Reporting Qualitative Research.

Findings: The overall theme was “From expressing human milk to breastfeeding—an essential element in the journey to motherhood.” The theme emerged from 3 categories: the birth preparation time has been interrupted; expressing human milk is essential for lactation; and the motherhood journey encompasses breastfeeding. The analysis also revealed that the categories were impacted by initiating, performing, and maintaining lactation and further influenced by inhibitors and promoters.

Implications for Practice: The promoters for performing milk expression and breastfeeding should be stimulated and the inhibitors should be eliminated. The achievement of “zero separation” and mother–infant couplet care in the NICU would be beneficial. In order for mothers to maintain successful lactation, it is essential that they receive supportive around-the-clock access to health professionals with expertise in lactation and breastfeeding until exclusive breastfeeding is well established.

Implications for Research: The study highlights the need to investigate mother–infant as one entity rather than separately as mother and infant.

Key Words: attachment, breastfeeding, content analysis, lactation, milk expression, mothers’ experiences, motherhood, neonatal intensive care unit (NICU), premature infant, qualitative design

Author Affiliations: Department of Paediatrics and Adolescent Medicine, Copenhagen University Hospital, Amager Hvidovre, Denmark (Drs Brødsgaard and Skaaning and Mss Andersen and Petersen); and Nursing and Health Care, Institute of Public Health, Aarhus University, Aarhus, Denmark (Dr Brødsgaard).

Dr Brødsgaard received funding from the local Strategic Research Funding Copenhagen University Hospital, Amager Hvidovre, grant no. E-21230-03. The other authors have no funding to disclose.

The authors declare no conflicts of interest.

Ethical Approval: The authors used a qualitative exploratory design, which does not require any ethical approval according to Responsible Conduct of Research and Danish law.

Clinical Trial Registration: The present study was a part of a larger study investigating the multifactorial influence of maternal and infant factors on breastfeeding premature infants, including a randomized control trial (RCT) with 174 mothers of 211 infants with an oral stimulation intervention. The RCT study was approved by the Danish Committees on Health Research Ethics, registration # ID 60112, and registered at the Danish Data Protection Board, registration # ID AHH-2015-106, and ClinicalTrials.gov, registration # ID NCT02952950. No further approval was necessary according to Danish law.

Correspondence: Anne Brødsgaard, PhD, MPH, RN, Department of Paediatrics and Adolescent Medicine, Copenhagen University Hospital Amager Hvidovre, Kettegård Allé 30, 2650 Hvidovre, Denmark (anne.broedsgaard.madsen@regionh.dk).

Copyright © 2021 by The National Association of Neonatal Nurses

DOI: 10.1097/ANC.0000000000000962

BACKGROUND AND SIGNIFICANCE

Lactation often plays a dominant role in how motherhood is experienced during the early postnatal period.¹ However, for mothers of premature infants (about 10% of infants worldwide), lactation and breastfeeding can be extremely challenging.^{2,3} Premature infants are fragile due to their early birth (less than 37 weeks of gestational age), and they often require treatment and care at a neonatal intensive care unit (NICU).⁴ A review from 2015 revealed that stable premature infants exposed to the breast as early as 27 to 28 weeks postconceptional age (PCA) maintain their physiological status. Furthermore, some infants exposed to the breast before 30 weeks PCA were exclusively breastfed at 32 weeks PCA.⁵ According to the World Health Organization, exclusive breastfeeding is the optimal nutrition for all infants during their first 6 months due to its nutritional, gastrointestinal, immunological, developmental, and psychological benefits.⁶ Early breastfeeding (before 32 weeks PCA) has also been found

to be less stressful to the premature infant than bottle-feeding.^{7,8} Nevertheless, research has revealed a lower incidence and a shorter duration of breastfeeding among premature infants than among full-term infants.⁷ Furthermore, mothers with limited lactation and breastfeeding during NICU admission experience many challenges breastfeeding their premature infant after discharge.^{3,9} This has been attributed to the challenges the mother and the premature infant encounter when milk supply is being established and maintained and during the transition from gavage feeding to breastfeeding in the NICU.^{7,10,11} Furthermore, at NICU discharge, a low milk volume is the most significant lactation barrier.¹² Thus, a mother's presence in the NICU is crucial to providing skin-to-skin contact, which facilitates milk production and breastfeeding.¹³

However, the NICU environment may cause significant psychological distress affecting milk expression and breastfeeding,^{14,15} difficulties with healthy maternal–infant bonding, and decreased maternal quality of life.¹⁶ A qualitative study of mothers of premature infants from Brazil showed that they felt sorrow, guilt, disappointment, frustration, and insecurity in addition to a fear of touching, holding, or harming their premature infants while breastfeeding.¹⁸ Mothers of premature infants from England conveyed that expressing human milk and lactation had become a source of stress and anxiety rather than a positive experience.¹⁹ Mothers from the United States found that providing milk for their hospitalized premature infants was exhausting and logistically challenging.²⁰ Mothers from Canada and Sweden experienced milk expression to be a difficult task that elicited paradoxical feelings of closeness/connection to and separation from their premature infants^{21,22}; these mothers found it difficult to maintain the goal of expressing milk with such vacillating levels of motivation.^{21,22} A study of Swedish mothers' narratives showed that it is “a journey to find one's unique way of lactation.”²³ Crucially, an integrative review of experiences of milk expression and breastfeeding among mothers of preterm infants found that it was essential for mothers that they could cope with the disruptive NICU environment, the demands of milk expression, and difficulties with lactation²⁴ regardless of whether breastfeeding was successful or not.

Moreover, mothers expressed that the support and knowledge they received at the NICU were random; one mother compared it to “being thrown into a lottery,” expressing that the level of support varied depending on which health professional was providing lactation support.²⁵ Several studies have emphasized the need to gain further insight into elements that modulate lactation in the NICU.^{5,21,26,27} Thus, the purpose of the present study was to explore the significance of and the circumstances affecting lactation among mothers of premature infants after NICU discharge.

What This Study Adds

- Increased awareness of promoters and inhibitors for initiating, performing, and maintaining milk expression, lactation, and breastfeeding for mothers and nurses in the NICU.
- Experiences from expressing human milk to breastfeeding were an essential element in the journey to motherhood and were of high significance to the mothers of prematurely born infants.
- Mother–infant separation in NICUs and obstetric units is a significant inhibitor. Zero separation and mother–infant couplet care in the NICU could serve as an innovative approach for practice.

METHODS

Design

The present qualitative study recruited participants among cohorts in a randomized control trial (RCT), titled “Breastfeeding duration in premature infants. Influence of oral stimulation intervention, the infant's suction and maternal concerns.” The RCT study included 174 mothers of 211 infants and showed no effect of oral stimulation on exclusive breastfeeding 6 month after discharge.²⁸ The study was approved by the Danish Committees on Health Research Ethics (ID 60112) and registered at the Danish Data Protection Board (ID AHH-2015-106) and ClinicalTrials.gov (ID NCT02952950). No further approval was necessary according to Danish law. The study followed the Declaration of Helsinki.²⁹ All participants were informed of the purpose of the study, and they all provided verbal and written consent. The present study of mothers of premature infants admitted to an NICU used a qualitative exploratory design. The study is reported according to the Standards for Reporting Qualitative Research (SRQR).

Setting and Sample

Single, in-depth, semistructured interviews were conducted with mothers of premature infants admitted to a university hospital NICU in the Capital Region of Denmark. The NICU has approximately 950 admissions a year, of which about 350 are admissions of prematurely born infants. The infants are admitted for intensive treatment and care. They are born at 28 weeks or more gestational age, there are no weight limits, and they have moderate to critical illness. The NICU's clinical practice is grounded in family-centered care (FCC) where partnership between parents and health professionals is essential.³⁰ FCC partnership is facilitated by unrestricted parental presence, involvement, participation, and communication based on respect and mutuality, knowledge sharing, and shared responsibility.³¹ Mothers and infants were purposively sampled. For infants, the inclusion criteria were less than 36⁶/₇ weeks of gestational age, infants from the RCT oral stimulation intervention/control group, and infants who had been discharged conventionally to home

from the NICU or via an NICU early discharge program (EDP). In the latter group, the infant and the family get weekly visits by an NICU nurse at home where they are for days or weeks with gavage feeding and learn to breastfeed before discharge.³² For mothers, the inclusion criteria were mothers 18 years or older, intending to breastfeed, interested in talking about the phenomenon under study, and able to express themselves in a Scandinavian language. Exclusion criteria were single mothers and mothers of twins or triplets. Members of the research team contacted the mothers by phone and invited them to participate in one interview. All contacted mothers agreed to participate.

Data Collection

A semistructured interview guide was developed (Table 1) on the basis of the literature presented in the background section and our extensive experience as NICU nurses and health visitors in the municipality healthcare. The interview guide was face validated in the first interview and deemed appropriate for the present purpose. All semistructured interviews took place at the mothers' homes with the mother, infant, and interviewer being present.

The interviewer knew the history of the infant, mother, and family but had not cared for them during their NICU admission. The interviewer, who is the last author, is female, works as an advanced nursing specialist with extended theoretical knowledge, holds a Master of Public Health degree, and has 16 years of clinical NICU nursing experience. This background enabled her to get detailed data about the mothers' experiences. Furthermore, prior to the interviews, the interviewer had her preconception uncovered³³ by the second author in an interview, which revealed that she was aware that the mothers might experience both positive and negative emotions during the interviews. For ethical reasons, the interviewer paid extra attention to the fact that some mothers could have had a feeling of not being successful or needed a referral to a psychologist. After the first interview, the first author listened to the audio-recorded interview and afterward provided feedback to the interviewer about her interview style. In that way, the interviewer increased her awareness of how she acted as a tool to generate rich and nuanced data.

The interviewer was a good listener who was not afraid of pauses. She was good at verbally acknowledging contributions and was curious about the mothers' beliefs and experiences.

The interviews took place in 2018 when the infant's corrected age was approximately 4 months and lasted 46 to 92 minutes (mean 73 minutes). At the end of the interviews, all informants expressed that it had been good to talk and reflect upon it all.

TABLE 1. The Semistructured Interview Guide

<ul style="list-style-type: none"> • How has it been for you to become a mother to (infant's name)? <ul style="list-style-type: none"> ○ What has been the best aspect? ○ What has been the most challenging aspect?
<ul style="list-style-type: none"> • What expectations did you have for breastfeeding before you gave birth? <ul style="list-style-type: none"> ○ How were your expectations met?
<ul style="list-style-type: none"> • What did it mean to you to begin lactation? <ul style="list-style-type: none"> ○ How did it go with your lactation?
<ul style="list-style-type: none"> • What has influenced your breastfeeding? <ul style="list-style-type: none"> ○ What has influenced you in establishing the breastfeeding process?
<ul style="list-style-type: none"> • What has it meant for you to continue breastfeeding?
<ul style="list-style-type: none"> • What knowledge about lactation and breastfeeding has mattered to you? <ul style="list-style-type: none"> ○ How? ○ When?
<ul style="list-style-type: none"> • How have you felt during the hospitalization process and up until today? <ul style="list-style-type: none"> ○ Have you felt anxious, depressed, or stressed? ○ If so, how do you think it has affected your lactation and breastfeeding?
<ul style="list-style-type: none"> • If you were to describe briefly (the infant's name), what would you highlight in particular? <ul style="list-style-type: none"> ○ Temperament, signals, rhythm, and regulation ○ What do you think it has meant for your breastfeeding?
<ul style="list-style-type: none"> • What was your first feeling when (infant's name) was born?
<ul style="list-style-type: none"> • Please describe how your feelings regarding (infant's name) have subsequently developed? <ul style="list-style-type: none"> ○ Are there any emotional moments or experiences that you remember in particular?
<ul style="list-style-type: none"> • What has your husband/partner meant to you during this process? <ul style="list-style-type: none"> ○ What about now?
<ul style="list-style-type: none"> • Is there anyone else who has meant/means a lot to you? <ul style="list-style-type: none"> ○ In what way?
<ul style="list-style-type: none"> • Do you have anything more to add?
<ul style="list-style-type: none"> • How did you feel about this interview?
<ul style="list-style-type: none"> • Thank you so much for participating!

Data Analysis

A transcription manual was developed and followed by 5 students of master of science in nursing who transcribed the interviews verbatim. The first author validated the transcriptions against the audio-recorded interviews to ensure the correctness of the transcription and its contextualization. Data were analyzed in the MS Office Word Software program. Content analysis was inspired by Graneheim and Lundman³⁴ and comprised 8 steps: (1) the researchers read the transcripts several times to get an overall sense of the content; (2) general meaning units were revealed as words, sentences, or paragraphs containing aspects that were interrelated in terms of their

content and context; (3) meaning units relevant to the study's research question were identified; (4) meaning units were condensed to reduce the text, while retaining the meaning of the content; (5) coding was performed to label meaning units relevant to the context; (6) meaning units were assigned to subcategories and (7) categories; and, finally, (8) an overall theme emerged. The theme emerged, that is, the underlying thread illustrating and expressing the latent meaning of the text. Categories are not necessarily mutually exclusive.³⁴ The first author was responsible for the analysis, which was an iterative process including the aforementioned steps.³⁴ However, the other authors were also involved in the processes of coding, categorizing, triangulating, discussing, and agreeing when data saturation had been achieved.³⁵

FINDINGS

The infants' chronological ages were 12⁴/₇ to 24³/₇ weeks (mean, 19³/₇ weeks) at the time of the interviews.

First, we present the characteristics of the included 16 mothers and premature infants in Table 2. Then, we present the overall theme that emerged from 3 categories in the analysis (Table 3). The 3 categories were related to initiating, performing, and maintaining lactation and were all influenced by inhibitors and promoters (Figure 1).

From Expressing Human Milk to Breastfeeding—An Essential Element in the Journey to Motherhood

The overall theme was “From expressing human milk to breastfeeding—an essential element in the journey to motherhood.” Three categories underpinned this theme: the birth preparation time has been interrupted; expressing human milk is essential for breastfeeding; and the motherhood journey encompasses lactation. The 3 categories and their subcategories are described later. Anonymized quotes, representative and illustrative of the categories, are included.

The Birth Preparation Time Has Been Interrupted

The premature delivery of the infant meant that none of the mothers experienced a full-duration birth preparation time for motherhood, but they were, nevertheless, all expected to initiate breastfeeding:

Because it is a natural thing to do. (#4)

I've been pregnant for four and a half months, knowing it. Of which one month was at the maternity ward with water discharge and one month, I was bleeding and vomiting constantly, so there hasn't been much calm//mentally I wasn't prepared. (#12)

I didn't attend birth preparation classes. (#3)

As a first-time mother, you're unsure of everything. (#1)

I wasn't engaged in lactation; I thought it would come quite naturally. (#8)

Inhibitors

Because of pregnancy complications, several mothers were ill and physically weakened, and they were emotionally and mentally much affected by these complications. They felt unprepared for motherhood. Some mothers took sick leave from work and were either hospitalized or required to make several weekly hospital visits. All this interrupted a “normal” preparation for birth and greatly limited them in their daily lives and activities. Furthermore, their experience of coherence was interrupted because they did not know what to expect. This prevented some of the mothers from being able to relate to their fetuses. They lacked the energy to read or get acquainted with anything that did not seem highly or immediately relevant, such as lactation. The pregnancy had become an uncertain waiting period, and each additional day represented a milestone in the infant's chances for survival, growth, and maturation.

Promoters

The mothers' preconception of breastfeeding was a promoter for its initiation. They saw breastfeeding as a natural, healthy, and uncomplicated process that was highly valued in society. In addition, their motivations differed widely. Some were prepared for breastfeeding, having knowledge about a sister's or a friend's maternity. Some were fascinated by the biology of human milk formation or saw it as a way to prevent digestive problems in the infant. Some viewed it as beautiful and life-affirming. Others represented a culture where breastfeeding was the infant's right and the mother would be acknowledged and rewarded for her effort.

Expressing Human Milk Is Essential for Breastfeeding

The mothers were unprepared that performing lactation would be a fragile, challenging, and emotional process after having given birth to a premature infant.

I didn't get information about starting milk expression at the delivery unit, so I started late, then I got sick with constipation and infection, and then I didn't express milk as often as I should. (#7)

At first, it felt like an assault to express milk from both breasts at the same time//And you try every third hour around the clock. (#3)

Expressing human milk was hard//unnatural//impersonal, and it takes a lot of patience and

TABLE 2. Characteristics of the 16 Included Mothers and Premature Infants

Participants	Mean Age, y	Nationality	Length of Highest Education ^a	First-time M	Mode of Delivery	RCT—Oral Intervention
1	32	Danish	Long	YES	Vaginal	+
2	33	Danish	Long	NO	PCS	+
3	30	German	Long	YES	ACS	–
4	38	Danish	Long	NO	Vaginal	–
5	32	Italian	Long	NO	Vaginal	–
6	35	Danish	Medium	YES	ACS	+
7	30	Danish	Medium	YES	PCS	–
8	35	Danish	Medium	NO	ACS	+
9	40	Danish	Medium	NO	ACS	–
10	37	Danish	Short	YES	PCS	–
11	32	Danish	Long	YES	Vaginal	+
12	39	Danish	Short	NO	ACS	–
13	40	Danish	Medium	YES	ACS	–
14	23	Turkish	PS	NO	ACS	+
15	34	Danish	PS	NO	ACS	–
16	32	Bosnian	PS	YES	PCS	+
Mean	34					

Participants	Infant Sex	GA, wk + d	BW, g	Discharged Through EDP	LOS in NICU	Status of Breastfeeding 6 wk Corrected Age
1	b	33 ^{4/7}	2660	YES	27	EB
2	b	34 ^{0/7}	1800	YES	22	EB
3	b	30 ^{2/7}	1510	NO	47	EB
4	g	32 ^{1/7}	1680	NO	31	EB
5	g	29 ^{2/7}	1205	YES	73	EB
6	b	27 ^{2/7}	1030	YES	87	EB
7	g	31 ^{4/7}	1540	YES	38	Bottle w. IF
8	g	35 ^{2/7}	2754	YES	20	EB
9	g	33 ^{1/7}	2110	YES	23	EB
10	g	36 ^{2/7}	1775	NO	14	EB
11	b	28 ^{2/7}	1310	YES	70	EB
12	g	34 ^{2/7}	2325	NO	14	EB
13	g	27 ^{3/7}	895	YES	90	Bottle w. IF
14	g	32 ^{3/7}	1760	NO	15	Lactation + Bottle w. IF
15	b	34 ^{6/7}	2605	NO	11	EB
16	b	33 ^{2/7}	2535	NO	19	Bottle w. IF
Mean		32 ^{1/7}	1843		38	

Abbreviations: ACS, acute cesarean section; b, boy; BW, birth weight; EB, exclusive breastfeeding; EDP, early discharge program; g, girl; GA, gestational age; IF, infant formula; LOS, length of hospital stay; M, mother; – (minus), control group; PCS, planned cesarean section; + (plus), intervention group; RCT, in the intervention group with oral stimulation; w., with.

^acategory, years of education after primary and secondary school, short: 2-2½ years-business academy education; medium: 3-4½ years-professional bachelor education; long: 3 years (bachelor) + 2 years (master) university education, and possibly an additional 3 years (PhD); PS, primary school (9-10 years).

TABLE 3. Illustration of the Analysis With Subcategories, Categories, and the Overall Theme

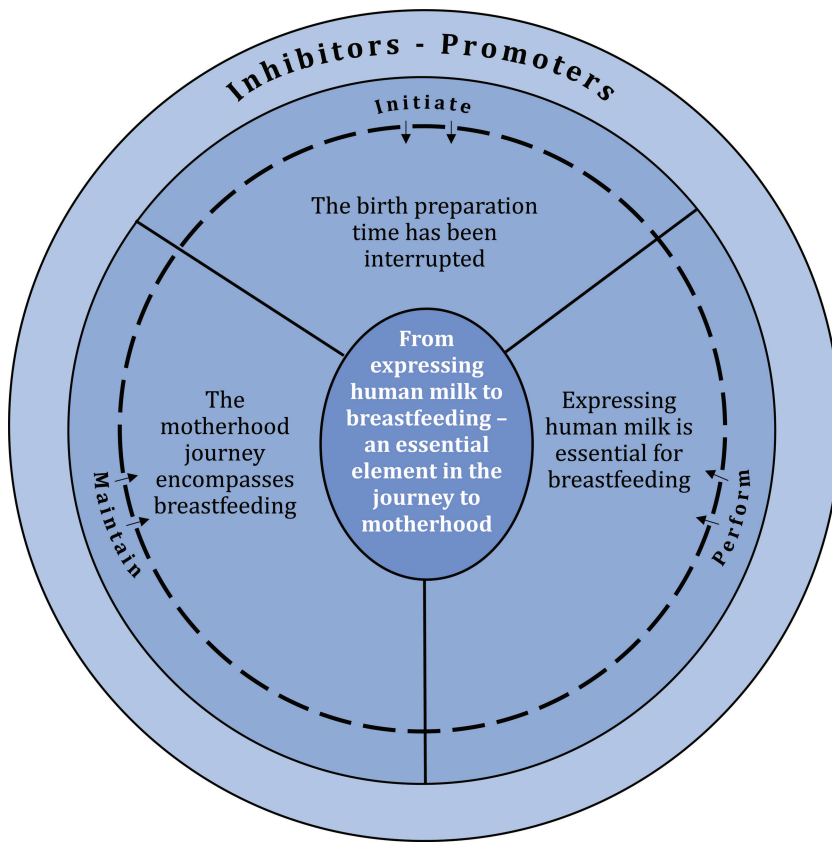
Subcategories	Categories	The Overall Theme
<ul style="list-style-type: none"> • When the body fails during pregnancy • Forthcoming motherhood was interrupted during pregnancy • The naturalness of breastfeeding is challenged 	The birth preparation time has been interrupted	From expressing human milk to breastfeeding—An essential element in the journey to motherhood
<ul style="list-style-type: none"> • Couplet care and zero separation from birth • The value of human milk • Expressing milk and lactation to compensate for the infant's prematurity • The continuum of expressing human milk • Establishing lactation of a premature infant "in no man's land" 	Expressing human milk is essential for breastfeeding	
<ul style="list-style-type: none"> • Partnership between family and nurses • Crisis response at premature birth • Attachment strengthened through sensory perception of the infant and breastfeeding • The emergence of motherhood in an unfamiliar world 	The motherhood journey encompasses breastfeeding	

willpower//I was unsure whether I could keep my milk production going. (#5)

I was so insecure for so long about disconnecting him from the CPAP (continuously positive airway pressure), so my heart stopped beating every time he

had to be taken off it because I thought he might have stopped breathing. I really just wanted to do something good for him by breastfeeding him, and at the same time, it was flashing red [at the monitor] all the time (laughs), so I was torn apart. (#6)

FIGURE 1



The overall theme and 3 categories influenced by initiating, performing, and maintaining lactation framed by inhibitors and promoters.

Inhibitors

Most mothers were separated from their premature infants shortly after giving birth because the infant was transferred to the NICU. Thus, the first “real” meeting with their infants was in the NICU. However, they were often unable to pick up their infants due to the premature infant’s vulnerability and need for supportive respiratory treatment, monitoring, and care and because of their own physical condition after delivery or a cesarean section. This made the mothers feel like spectators; they felt distanced from their infants and were emotionally insecure about whether their infants belonged to them or not. They found it challenging and extremely unnatural to be separated from their infants. This feeling was reinforced by the mothers being primarily admitted to an obstetric unit where they were continuously being confronted with healthy, mature infants, and a natural postpartum process for parents very different from their own situation and the NICU setting.

Another significant inhibitor was the delayed start of human milk expression. This delay was due to several factors. First, the mothers needed to prioritize their own basic needs (eg, physical condition or lack of sleep). Second, professional knowledge sharing with the mothers concerning the purpose, procedure, and importance of starting human milk expression early was lacking. Being able to express milk, even if just a few drops, created meaning for the mothers and made it possible for them to act in relation to lactation. Some mothers found it degrading to sit with a breast pump that made them feel like “a milking cow.” Unable to view early milk expression as something that would benefit them later, the mothers lacked motivation to perform lactation.

Furthermore, some found the environment to be stressful and felt that it affected their production of milk in a negative way. Mothers in the NICU experienced this to be part of a continuous, cyclic, and exhausting process. Milk expression could be hard, competitive (between NICU admitted mothers regarding the amount of expressed milk), and frustrating; yet, it was also a marker of successful motherhood. Moreover, the mothers felt that lactation was being established in a “no man’s land” because the NICU environment lacked privacy and was stressful and unfamiliar to them. Intensive care equipment and infant monitoring were troublesome and provoked anxiety because of the alarms, and they feared that the infant might stop breathing when placed to feed.

Promoters

For all the mothers, their expressed milk became their opportunity to compensate for the premature delivery, reduce their guilt, and promote healing. They viewed their expressed milk as “the umbilical cord outside the uterus,” and it became their way of

contributing to the survival and growth of their fragile premature infants. Expressing milk was perceived to have more value than breastfeeding itself. Having a breast pump available 24 hours a day, 7 days a week without having to wait for one to become available was also a promoter. Mothers felt more emotionally balanced and motivated if they were able to overcome the notion of human milk expression as an unnatural process and instead saw the breast pump as their “friend” and the milk expression as a safety net and lifeline that facilitated lactation.

In addition, skin-to-skin contact strengthened the mothers’ awareness of their infants. It provided closeness and created security for the mothers. It was an action that facilitated their interaction with and attachment to their infants. Moreover, skin-to-skin contact promoted the establishment of lactation.

The nurses shared knowledge with the mothers in an accommodating way, which enabled the mothers to feel a partnership with them. The mothers felt that the nurses helped them during the different phases of establishing breastfeeding by being caring, acknowledging, and available. The nurses provided the mothers with practical knowledge and were action-oriented and emotionally supportive. Although human expressed milk and lactation were undoubtedly the professional recommendation, the nurses always acknowledged and supported the mothers, regardless of their choices or ways of providing nutrition. Knowledge sharing, acknowledgment, praise, action-oriented support, shared responsibility, and continuity were all components that motivated the mothers. These components not only strengthened the mothers’ confidence, belief in themselves, action competence, and autonomy but also promoted breastfeeding and facilitated their motherhood.

The Motherhood Journey Encompasses Breastfeeding

Although successful breastfeeding of a premature infant “is not a walk in the park” (#11), maintaining lactation is less challenging than starting lactation, and successful breastfeeding contributes to the feeling of motherhood.

It [breastfeeding] has been totally uncomplicated after we came home. (#3)

I have decided, [now] when it works, I will breastfeed fully for six months until I start work again. (#11)

Motherhood is many things, and breastfeeding is only part of it//, but there is something magical about it. (#13)

It definitely means feeling like a mother. (#16)

Inhibitors

The premature birth drove mothers into a crisis. Life was put on hold; their alertness was high and prolonged; they had been existentially hit. They experienced both physical and mental vulnerability.

Dealing with the crisis put them into a “fight or flight mode.” Staying at the NICU was a difficult start to motherhood. It was like living in a “bubble,” somewhat of a “zombie existence,” which complicated the journey into motherhood.

Promoters

Some mothers would have a feeling of double guilt; first, because of the premature delivery, and, second, if they failed at expressing human milk and lactation was unsuccessful. This mobilized some mothers to adopt a “fight mode,” and they were determined to win the lactation fight (ie, successful breastfeeding). This “fight mode” was not only a cognitive decision but also based on the mothers’ emotions, such as attachment to their infants. This attachment developed over time and was strengthened along with the infant’s maturation. However, the more opportunities the mothers had to be familiar with their infants’ signals and have successful interaction, the more they felt like mothers and became attached to their infants. Here, lactation was essential, making the mother feel important and unique. Moreover, breastfeeding created a strong mother–infant bond. Mothers were breastfeeding not only for the benefit of the infant but also because it was essential to them as mothers. Although motherhood encompassed more than lactation, being able to breastfeed strengthened their identity as mothers. Most of the mothers viewed “a true mother” as one who breastfeeds. Breastfeeding was well established for most mothers at NICU discharge, and once the mothers were reunited with their families at home, breastfeeding was uncomplicated, economical, practical, easy, calming, and cozy. The mothers who were unable to maintain lactation managed coming to terms with it.

DISCUSSION

We found that for mothers of prematurely born infants, the journey from milk expression to lactation played an essential role in motherhood. The mothers’ preconception was that lactation was a natural, uncomplicated process. The birth of a premature infant overruled this preconception, interrupted their preparation for birth, and made them unable to focus on *initiating* lactation. Our findings confirm that a mother’s preconception and attitude toward breastfeeding are important³⁶ and along with early physical contact serve as strong predictors of lactation initiation, frequency of expression human milk, and inviting the infant to the breast in the NICU.^{4,13,36} Moreover, breastfeeding has stress-reducing benefits.³⁷ Physical contact as soon as possible after birth of the premature infant should therefore be encouraged³⁶ to avoid any delay in the mothers’ early start of human milk expression.

We found that the mothers perceived human milk expression as an essential foundation for lactation in the NICU. We also identified several factors either inhibiting or promoting mothers’ ability to *perform* milk expression. A key inhibitor was the separation of mother and infant. New scientific literature presents strong arguments for “zero separation” of mother and infant because separation is a source of toxic stress.³⁸ Inversely, zero separation may promote skin-to-skin contact, which promotes autonomic development and physiological regulation, leading to emotional connection and resilience.³⁸ In addition, a prolonged daily duration of skin-to-skin contact is associated with earlier attainment of lactation.³⁹ Research also emphasizes that mother–infant care in co-care facilities is associated with significantly lower maternal levels of stress and perceived incompetence.⁴⁰ This supports the need to ensure that mother–infant dyads are not separated.⁴⁰ Care allowing extended mother–infant contact during the first postpartum days is associated with increased vigilance in mothering and more affectionate behavior toward the infant, that is, maternal bonding.⁴¹

Our findings clearly show how vital it is for nurses to share knowledge and form partnerships with mothers in the NICU in order to promote their milk expression, establish breastfeeding, and nurture the feelings of motherhood. This is in line with Mercer and Walker’s⁴¹ theory of “fostering the becoming of a mother” and satisfaction with the maternal role. Mercer and Walker⁴¹ found that mothers’ low self-confidence can delay the transition into the maternal role and identity and can limit mothers’ satisfaction with their role. In contrast, mothers who achieve a high level of self-confidence are more satisfied with their maternal role.⁴² Thus, nurses should use strategies that can increase mothers’ self-confidence during NICU admission to promote milk expression and to protect and improve mother–infant bonding and the feeling of motherhood. Even with FCC³⁰ as the primary model of NICU care, this can be challenging for nurses.¹⁵ Our findings are mirrored in other studies, which also found that milk expression is like “giving life” to premature infants and that this experience motivates mothers to continue performing milk expression.^{20,43}

Our finding that mothers who had become “friends” with the breast pump were emotionally more balanced is also supported by theory and research showing that activities and personal projects found to be challenging, meaningful, and rewarding are likely to promote subjective well-being.⁴⁴ Furthermore, studies have found that being a good mother was a reason for the perceived obligation to express human milk and lactate.²⁴ Thus, nurses are in a unique position to help enable mothers to navigate this difficult situation⁴⁵ and they should do so to avoid making mothers feel that

breastfeeding has to be established in a “no man’s land.” A nursing focus on zero separation and couplet care could give nurses an optimal position from which to strengthen the mother–infant dyad, merge and integrate the basic individual and mutual mother–infant needs, and cultivate the intimate interplay between milk expression and establishment of breastfeeding. Such a focus would clearly benefit mother and infant. It would also ensure societal gains; hence, an article from 2019 estimated that the global economic loss associated with failed lactation amounted to 0.70% of the global gross national income.⁴⁶ Therefore, mother–infant dyads should be studied and cared for as one entity rather than separately as mother and infant.⁴⁷

Finally, we found that *maintaining* breastfeeding was an important element in the journey to motherhood according to those mothers who were able to lactate. We found that *maintaining* breastfeeding after leaving the NICU was less challenging than establishing lactation in the NICU. This is contrary to findings from an integrative review, which concluded that mothers experienced many challenges breastfeeding their premature infants after NICU discharge.⁹ This discrepancy could be attributed to differences in the degree to which lactation was

established. Mothers in our study who were discharged through the EDP⁴⁸ were paid weekly home visits by NICU nurses, and both such mothers and mothers discharged directly from the NICU immediately received visits from a municipality health visitor. Thus, until exclusive breastfeeding was well established, they had around-the-clock access to and support from health professionals with expertise in lactation and breastfeeding if needed.⁴⁹ However, research indicates that lactation maintenance is also affected by the mothers’ motivation. Thus, mothers with intrinsic motivation breastfeed their infants longer than mothers whose motivation for breastfeeding is extrinsic.⁵⁰ Therefore, in their FCC partnership, whether in an NICU or an EDP, nurses/health professionals and mothers may be advised to identify key factors that positively affect a mother’s autonomous motivation (eg, knowledge, self-confidence)⁵⁰ for lactating her premature infant.

Limitations

Single mothers and mothers of twins and triplets were excluded, which is a limitation that could have affected the findings. Most mothers had either a long or medium-length education and were older, which could have affected the findings. In addition,

Summary of Recommendations for Practice and Research

What we know:	<ul style="list-style-type: none"> • The birth preparation time was disturbed for several mothers due to their own physical and mental conditions and the premature birth of the infant. • Expressing mother's own milk was demanding but essential for lactation and breastfeeding. • The motherhood journey encompasses breastfeeding. • Inhibitors and promoters determined conditions for the mother during the premature infants' admission in the NICU.
What needs to be studied:	<ul style="list-style-type: none"> • Study mother–infant dyads as one entity rather than mother and infant separately to promote lactation and breastfeeding. • Study mother–infant dyads within the FCC entity regarding early promoting a healthy everyday life at home with exclusively breastfeeding. • Providing of “zero separation” from the very start coupling the medical care of the infant with the care of the mother, as soon as the mother’s condition allows it, as an ultra-early intervention in the NICU environment to promote milk expression and lactation.
What can we do today:	<ul style="list-style-type: none"> • Promoters for initiating, performing, and maintaining milk expression, lactation, and breastfeeding should be stimulated and opposing inhibitors eliminated. • Facilitate early physical contact already at the time of birth and as much skin-to-skin contact between mother and infant during the NICU admission. • Identify strategies to increase the mothers' self-confidence during the NICU admission. • Form FCC partnerships with mothers to facilitate their performance in milk expression, lactation, and breastfeeding. • Facilitate not only an established lactation but also well-established exclusive breastfeeding before discharge. • Provide EDPs with NICU nurses, health visitors in the municipalities, or equivalent health professionals to support the mothers in maintaining breastfeeding after discharge.

a risk of memory bias exists. Although the infants were all about the same postdischarge age when the interview took place, their postmenstrual age, pathway in the NICU, and mortality risk differed profoundly, which may be reflected in the findings. However, we wanted to obtain rich and nuanced data and therefore included different types of families admitted to the NICU. The principal investigator is experienced in performing qualitative studies, and the analysis was rigorous and transparent with consensus between the researchers, which bodes for the validity of our findings. The findings are therefore believed to represent patterns valid for the phenomenon being studied in the population in question. Thus, although the findings cannot be generalized, they can be transferred to other contexts and cultures.

CONCLUSION

This study revealed that mothers of prematurely born infants experienced a journey from human milk expression to breastfeeding that played an essential role in their attainment of motherhood. However, to achieve lactation was not a “walk in the park” because mothers were faced with inhibiting circumstances, especially during initiation and performance of lactation in the NICU. Factors promoting initiating, performing, and maintaining milk expression, lactation, and breastfeeding should be stimulated and any inhibitors eliminated. Zero separation and couplet care within the context of an FCC partnership model could optimize circumstances for mothers and nurses. These practices would facilitate early milk expression, early and prolonged mother–infant skin-to-skin contact, and increased exclusive lactation before discharge, thus helping mothers maintain exclusive breastfeeding after discharge.

References

- Shoim N, Hugh-Jones S, Rudolf MCJ, Feltbower RG, Lans O, Hetherington MM. “It’s like giving him a piece of me”: exploring UK and Israeli women’s accounts of motherhood and feeding. *Appetite*. 2015;95:58-66. doi:10.1016/j.appet.2015.06.004.
- Gianni ML, Bezze EN, Sannino P, et al. Maternal views on facilitators of and barriers to breastfeeding preterm infants. *BMC Pediatr*. 2018;18(1):283. doi:10.1186/s12887-018-1260-2.
- Briere C-E, McGrath JM, Cong X, Brownell E, Cusson R. Direct-breastfeeding premature infants in the neonatal intensive care unit and breastfeeding duration for preterm infants. *J Hum Lact*. 2015;31(3):386-392. doi:10.1177/0890334415581798.
- Althabe F, Howson CP, Kinney M, Lawn J; World Health Organization. *Born too soon: the global action report on preterm birth*. <http://www.who.int/pmnch/media/news/2012/201204%5Fborntoosoon-report.pdf>. Published 2012. Accessed August 3, 2020.
- Lucas RF, Smith RL. When is it safe to initiate breastfeeding for preterm infants? *Adv Neonatal Care*. 2015;15(2):134-141. doi:10.1097/ANC.0000000000000167.
- World Health Organization. *Indicators for Assessing Infant and Young Child Feeding Practices: Conclusions of a Consensus Meeting Held 6-8 November 2007 in Washington D.C., USA*. Geneva, Switzerland: World Health Organization; 2008.
- Callen J, Pinelli J. A review of the literature examining the benefits and challenges, incidence and duration, and barriers to breastfeeding in preterm infants. *Adv Neonatal Care*. 2005;5(2):72-88. doi:10.1016/j.adnc.2004.12.003.
- Black A. Breastfeeding the premature infant and nursing implications. *Adv Neonatal Care*. 2012;12(1):10-14. doi:10.1097/ANC.0b013e3182425ad6.
- Briere C, McGrath J, Cong X, Cusson R. An integrative review of factors that influence breastfeeding duration for premature infants after NICU hospitalization. *J Obstet Gynecol Neonatal Nurs*. 2014;43(3):272-281. doi:10.1111/1552-6909.12297.
- Flacking R, Ewald U, Nyqvist KH, Starrin B. Trustful bonds: a key to “becoming a mother” and to reciprocal breastfeeding. Stories of mothers of very preterm infants at a neonatal unit. *Soc Sci Med*. 2006;62(1):70-80. doi:10.1016/j.socscimed.2005.05.026.
- Flacking R, Ewald U, Starrin B. “I wanted to do a good job”: experiences of “becoming a mother” and breastfeeding in mothers of very preterm infants after discharge from a neonatal unit. *Soc Sci Med*. 2007;64(12):2405-2416. doi:10.1016/j.socscimed.2007.03.008.
- Callen J, Pinelli J, Atkinson S, Saigal S. Qualitative analysis of barriers to breastfeeding in very-low-birth weight infants in the hospital and postdischarge. *Adv Neonatal Care*. 2005;5(2):93-103. doi:10.1016/j.adnc.2004.12.005.
- Cartwright J, Atz T, Newman S, Mueller M, Demirci JR. Integrative review of interventions to promote breastfeeding in the late preterm infant. *J Obstet Gynecol Neonatal Nurs*. 2017;46(3):347-356. doi:10.1016/j.jogn.2017.01.006.
- Schuetz Haemmerli N, Lemola S, Holditch-Davis D, Cignacco E. Comparative evaluation of parental stress experiences up to 2 to 3 years after preterm and term birth. *Adv Neonatal Care*. 2020;20(4):301-313. doi:10.1097/ANC.0000000000000714.
- Palmquist AEL, Holdren SM, Fair CD. “It was all taken away”: lactation, embodiment, and resistance among mothers caring for their very-low-birth-weight infants in the neonatal intensive care unit. *Soc Sci Med*. 2020;244:112648. doi:10.1016/j.socscimed.2019.112648.
- Holditch-Davis D, Santos H, Levy J, et al. Patterns of psychological distress in mothers of preterm infants. *Infant Behav Dev*. 2015;41:154-163. doi:10.1016/j.infbeh.2015.10.004.
- Staver MA, Moore TA, Hanna KM. Maternal distress in the neonatal intensive care unit: a concept analysis. *Adv Neonatal Care*. 2019;19(5):394-401. doi:10.1097/ANC.0000000000000642.
- Davim RM, Enders BC, Silva RA. Mothers’ feelings about breastfeeding their premature babies in a rooming-in facility. *Rev Esc Enferm USP*. 2010;44(3):713-718. doi:10.1590/S0080-62342010000300023.
- Cescutti-Butler L, Hemingway A, Hewitt-Taylor J. “His tummy’s only tiny”—scientific feeding advice versus women’s knowledge. Women’s experiences of feeding their late preterm babies. *Midwifery*. 2019;69:102-109. doi:10.1016/j.midw.2018.11.001.
- Parker MG, Lopera AM, Kalluri NS, Kistin CJ. “I felt like I was a part of trying to keep my baby alive”: perspectives of Hispanic and non-Hispanic Black mothers in providing milk for their very preterm infants. *Breastfeed Med*. 2018;13(10):657-665. doi:10.1089/bfm.2018.0104.
- Bujold M, Feeley N, Axelin A, Cinquino C. Expressing human milk in the NICU: coping mechanisms and challenges shape the complex experience of closeness and separation. *Adv Neonatal Care*. 2018;18(1):38-48. doi:10.1097/ANC.0000000000000455.
- Hurst N, Engebretson J, Mahoney JS. Providing mother’s own milk in the context of the NICU: a paradoxical experience. *J Hum Lact*. 2013;29(3):366-373. doi:10.1177/0890334413485640.
- Palmér L, Ericson J. A qualitative study on the breastfeeding experience of mothers of preterm infants in the first 12 months after birth. *Int Breastfeed J*. 2019;14(1):35. doi:10.1186/s13006-019-0229-6.
- Ikonen R, Paavilainen E, Kaunonen M. Preterm infants’ mothers’ experiences with milk expression and breastfeeding: an integrative review. *Adv Neonatal Care*. 2015;15(6):394-406. doi:10.1097/ANC.0000000000000232.
- Ericson J, Palmér L. Mothers of preterm infants’ experiences of breastfeeding support in the first 12 months after birth: a qualitative study. *Birth*. 2019;46(1):129-136. doi:10.1111/birt.12383.
- Gianni ML, Bezze E, Sannino P, et al. Facilitators and barriers of breastfeeding late preterm infants according to mothers’ experiences. *BMC Pediatr*. 2016;16(1):179. doi:10.1186/s12887-016-0722-7.
- Parker MG, Hwang SS, Forbes ES, Colvin BN, Brown KR, Colson ER. Use of the theory of planned behavior framework to understand breastfeeding decision-making among mothers of preterm infants. *Breastfeed Med*. 2020;15(10):608-615. doi:10.1089/bfm.2020.0127.
- Skaaning D, Carlsen E, Brødsgaard A, et al. Randomised oral stimulation and exclusive breastfeeding duration in healthy premature infants. *Acta Paediatr*. 2020;109(10):2017-2024. doi:10.1111/apa.15174.
- The World Medical Association, Inc. Declaration of Helsinki. Ethical principles for medical research involving human subjects. <https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects>. Accessed 16 January 2018.
- Coyne I, Holmström I, Söderbäck M. Centeredness in healthcare: a concept synthesis of family-centered care, person-centered care and child-centered care. *J Pediatr Nurs*. 2018;42:45-56. doi:10.1016/j.pedn.2018.07.001.
- Brødsgaard A, Pedersen JT, Larsen P, Weis J. Parents’ and nurses’ experiences of partnership in neonatal intensive care units: a qualitative review and meta-synthesis. *J Clin Nurs*. 2019;28(17/18):3117-3139. doi:10.1111/jocn.14920.
- Brødsgaard A, Zimmermann R, Petersen M. A preterm lifeline: early discharge programme based on family-centred care. *J Spec Pediatr Nurs*. 2015;20(4):232-243. doi:10.1111/jspn.12120.
- Nystrom M, Dahlberg K. Pre-understanding and openness—a relationship without hope? *Scand J Caring Sci*. 2001;15(4):339-346. doi:10.1046/j.1471-6712.2001.00043.x.
- Graneheim UH, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Educ Today*. 2004;24(2):105-112. doi:10.1016/j.nedt.2003.10.001.
- Saunders B, Sim J, Kingstone T, et al. Saturation in qualitative research: exploring its conceptualization and operationalization. *Qual Quant*. 2018;52(4):1893-1907. doi:10.1007/s11335-017-0574-8.
- Niela-Vilén H, Melender H-L, Axelin A, Löytyniemi E, Salantera S. Predictors of breastfeeding initiation and frequency for preterm infants in the NICU. *J Obstet Gynecol Neonatal Nurs*. 2016;45(3):346-358. doi:10.1016/j.jogn.2016.01.006.
- Pados BF, Hess F. Systematic review of the effects of skin-to-skin care on short-term physiologic stress outcomes in preterm infants in the neonatal intensive care unit. *Adv Neonatal Care*. 2020;20(1):48-58. doi:10.1097/ANC.0000000000000596.
- Bergman NJ. Birth practices: maternal–neonate separation as a source of toxic stress. *Birth Defects Res*. 2019;111(15):1087-1109. doi:10.1002/bdr2.1530.

39. Oras P, Thernström Blomqvist Y, Hedberg Nyqvist K, et al. Skin-to-skin contact is associated with earlier breastfeeding attainment in preterm infants. *Acta Paediatr.* 2016;105(7):783-789. doi:10.1111/apa.13431.
40. Flacking R, Thomson G, Ekenberg L, Löwegren L, Wallin L. Influence of NICU co-care facilities and skin-to-skin contact on maternal stress in mothers of preterm infants. *Sex Reprod Healthc.* 2013;4(3):107-112. doi:10.1016/j.srhc.2013.06.002.
41. Mercer RT, Walker LO. A review of nursing interventions to foster becoming a mother. *J Obstet Gynecol Neonatal Nurs.* 2006;35(5):568-582. doi:10.1111/j.1552-6909.2006.00080.x.
42. Fasanghari M, Kordi M, Asgharipour N. Effect of maternal role training program based on Mercer theory on maternal self-confidence of primiparous women with unplanned pregnancy. *J Educ Health Promot.* 2019;8:4. doi:10.4103/jehp.jehp_202_17.
43. Rossman B, Kratovil AL, Greene MM, Engstrom JL, Meier PP. "I have faith in my milk": the meaning of milk for mothers of very low birth weight infants hospitalized in the neonatal intensive care unit. *J Hum Lact.* 2013;29(3):359-365. doi:10.1177/0890334413484552.
44. Nelson SK, Kushlev K, Lyubomirsky S. The pains and pleasures of parenting: when, why, and how is parenthood associated with more or less well-being? *Psychol Bull.* 2014;140(3):846-895. doi:10.1037/a0035444.
45. Vetcho S, Cooke M, Ullman AJ. Family-centred care in dedicated neonatal units: an integrative review of international perspectives. *J Neonatal Nurs.* 2020;26(2):73-92. doi:10.1016/j.jnn.2019.09.004.
46. Walters DD, Phan LTH, Mathisen R. The cost of not breastfeeding: global results from a new tool. *Health Policy Plan.* 2019;34(6):407-417. doi:10.1093/heapol/czz050.
47. Lau C. Breastfeeding challenges and the preterm mother–infant dyad: a conceptual model. *Breastfeed Med.* 2018;13(1):8-17. doi:10.1089/bfm.2016.0206.
48. Koreska M, Petersen M, Andersen BL, Brødsgaard A. Supporting families on their journey towards a normal everyday life—facilitating partnership in an early discharge program for families with premature infants. *J Spec Pediatr Nurs.* 2020;25(1):1-10. doi:10.1111/jspn.12274.
49. Kronborg H, Vaeth M, Kristensen I. The effect of early postpartum home visits by health visitors: a natural experiment. *Public Health Nurs.* 2012;29(4):289-301. doi:10.1111/j.1525-1446.2012.01019.x.
50. Mizrak Sahin B, Ozerdogan N, Ozdamar K, Gursoy E. Factors affecting breastfeeding motivation in primiparous mothers: an application of breastfeeding motivation scale based on self-determination theory. *Health Care Women Int.* 2019;40(6):637-652. doi:10.1080/07399332.2018.1526289.