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Breastfeeding and Becoming a Mother

Influences and Experiences of Mothers of Preterm Infants

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Abstract
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The overall aim of this thesis was to expand the knowledge and understanding of the processes of breastfeeding and becoming a mother in mothers of preterm infants.

For this purpose, in-depth interviews were conducted with 25 mothers, whose very preterm infants had received care in seven neonatal units (NU) in Sweden, 1-12 months after discharge (I-II). In addition, prospective population-based register studies were performed of infants born 1993-2001; among 35 250 term and 2093 preterm infants (III), and a subpopulation of 225 very preterm infants (IV). Data were obtained from the Child Health Service registry of breastfeeding in Uppsala and Örebro, the Medical Birth Registry, and Statistics Sweden.

The experiences of mother-infant separation, institutional authority, emotional exhaustion and disregard of breastfeeding as a relational interplay, comprised major hindrances to mothers' experiences of breastfeeding as reciprocal and of a secure mother-infant relation, during and after the discharge from an NU (I-II). All studied socioeconomic factors, i.e. lower educational level, receiving unemployment benefit or social welfare or having a low equivalent disposable income, were individually adversely associated with breastfeeding up to six months of infants' postnatal age, but were not found more decisive for weaning in mothers of preterm infants compared to those of term infants (III). Preterm infants were breastfed for a shorter time than term infants (III), but a long breastfeeding duration was evident. In addition, gestational age and neonatal disorders were not associated with breastfeeding duration in very preterm infants (IV).

In conclusion, this thesis shows that improvements in the NU environment and the caring paradigm are called for. Furthermore, as socioeconomic status clearly has an impact on breastfeeding duration, increased equity in health care in accordance with the individuals' needs must be sought, where resources are allocated to ensure fulfilment of needs in more vulnerable mothers and infants.

Keywords: Breastfeeding, Becoming a mother, Preterm infants, Mothers, Register, Neonatal care, Neonatal unit, Socioeconomic status

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I would like to dedicate this thesis to the mothers I have met,
and to my children Johan, Anton and Nike

On the cover Vincent, born after 30 weeks of gestation,
is shown at 4 days of age, weighing 1400 grams
and lying at his mother Sofia's breast.
Photograph taken by Vincent's father Anders Östman.
Printed by permission of the family.

List of publications

This thesis is based on the following studies (papers), which will be referred to in the text by their Roman numerals:

I. 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.

II. 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, in press)

III. Flacking R, Hedberg Nyqvist K, Ewald U. Effects of socioeconomic status on breastfeeding duration in mothers of preterm and term infants.
(Eur J Public Health, in press)

IV. Flacking R, Wallin L, Ewald U. Perinatal and socioeconomic determinants of breastfeeding duration in very preterm infants.
(submitted)

Contents

Abbreviations

CHC	Child Health Centre
CHS	Child Health Service
CI	Confidence interval
GW	Gestational week
ICD	International Classification of Diseases
IQR	Interquartile range
KMC	Kangaroo Mother Care
MBR	The Swedish Medical Birth Registry
NIDCAP	Newborn Individualized Developmental Care and Assessment Program
NU	Neonatal Unit
OECD	Organisation for Economic Co-operation and Development
OR	Odds ratio
PNA	Postnatal age
PT	Preterm, < 37 gestational weeks
SD	Standard deviation
SDS	Standard deviation score
SES	Socioeconomic status
VPT	Very preterm, < 32 gestational weeks

Introduction

Becoming a mother is a process that begins when a woman becomes pregnant, or even before. During pregnancy, the biological, psychological and social experiences contribute to a psychological preparation for motherhood (1-3). After birth, the woman reformulates herself in relation to her infant. This reformulation takes place in a social world in which experiences and perception of the 'self' derive not only from the interaction with the infant but also through the process of social interaction with others (4). In the mother-infant interaction, emotions are vital, as they constitute the principal means of communication. The development and subsequent attainment of a maternal identity involve the formation of an emotional bond between the mother and her infant, a bond which is influenced both by the infant's characteristics and by the woman's self-image and support from significant others (5) in a culture-specific context.

Stern and Bruschweiler-Stern (6) regard the establishment of an emotional and affectionate bond with the infant as part of the process of becoming a mother. They suggest that the likelihood of establishing a loving bond is dependent on the mother's capability of creating such an affectionate relationship. The foundation of motherhood is also a question of securing the infants' survival, which can be regarded as a test of biological ability. Breastfeeding is triggered through biological mechanisms which have not changed with time, but the perception of breastfeeding as a phenomenon is variable, as it not only reflects cultural values of motherhood (7-10) but is also negotiable from the perspective of the individual.

When an infant is born preterm, and especially very preterm, the women is giving birth to an infant for whom she is not mentally prepared, which implies an encounter between a premature mother and a prematurely born, fragile and medically hyperdependent infant (11). Furthermore, as very preterm infants are immature in their development, the process of establishing breastfeeding may take a long time. The experienced process of breastfeeding and becoming a mother of a preterm infant might therefore be expected to be quite different from the process experienced by mothers of infants born at term.

The preterm infant

Preterm deliveries (at < 37 weeks of gestation) are reported to constitute about 5% of all births in developed countries (12), although these figures are dependent on the various national criteria for registration of foetal deaths as well as of stillbirths (13). The prevalence of very preterm birth (at < 32 gestational weeks) is approximately 1-2% of all births (14,15).

Most preterm births follow spontaneous preterm labour or premature rupture of membranes. Known medical risk factors for preterm labour include induction for medical reasons such as infection, ablatio placentae/placenta praevia, growth retardation, and multiple pregnancy (16). It has been shown that adverse social circumstances such as less education (17,18), lower occupation (19) and a low income (20) are significantly associated with an increased risk for preterm birth. The findings regarding associations of smoking and marital status with preterm birth are inconsistent (14,21).

In preterm infants, the need for neonatal care is caused primarily by immaturity and adaptation to extrauterine life, and varies in extent and duration (22). Compared to term infants, very preterm infants constitute a very vulnerable population with regard to neonatal mortality and morbidity, and concerning impaired cognitive function and behavioural problems during infancy and early childhood (14,23,24).

Experiences of becoming a mother in a neonatal unit

When an infant is born preterm and needs neonatal care, the mothers are thrown into a situation, in which they are not mentally prepared for the anticipated infant; nor are they prepared for the public and medically oriented setting at a neonatal unit (NU) (11). The physical state of the mothers is also often compromised before and after the delivery. The mothers are usually separated from their infants and their families soon or directly after birth, as they themselves are taken care of at a maternity unit and their infants at an NU. The mother-infant separation, the uncertainty of whether the infant is going to live or die, and the mothers' experience of their infants as small, sick and vulnerable may lead to a less positive perception of the infant and to feelings of stress (25,26).

Even though there has been a change in the attitude of the staff and in neonatal care towards a more family-centred approach (27), the mothers may experience that the care is infant-focused and task-oriented, that roles in the NU are non-negotiable, and that participation of the mothers only takes place under supervision (28,29). It is suggested that such an inhibitive provision of care results in exclusion of the mothers from care taking, giving them feelings of powerlessness, alienation and being unimportant as a mother (28,30,31). Lupton and Fenwick (32) found that mothers who experienced

such inhibitive care tried to conform to the perceived norm of "good mothering" existing at the NU. Such constructions meant actions such as using specialised medical terms, trying to fit in with the routines, and controlling their temper in order to avoid provocation.

In general, mothers of infants receiving neonatal care exhibit higher emotional distress than normative values (33). Studies of mothers of preterm infants have shown that 40-76% experience depressive symptoms or symptoms of psychological trauma during the time at the NU (34,35). It has also been found that a higher level of education and perception of a supportive staff decrease the likelihood of depressive symptoms (34) and that effective intervention in terms of professional psychological support may reduce symptoms of traumatisation (35). Various efforts have been made to increase parental competence and involvement. Strategies and policies such as Kangaroo Mother Care (KMC), the Newborn Individualized Developmental Care and Assessment Program (NIDCAP) or non-separation of the mother and infant have been implemented in neonatal units to various extents and with various influences (36-39).

Experiences of becoming a mother, after the infant's discharge

Few studies have addressed the question of how mothers of high-risk infants experience their parenting after discharge of the infant from an NU. It is suggested that psychosocial developmental processes, such as becoming a mother, are not linear but are complex processes, as the establishment of a maternal identity is influenced by both maternal and infant variables and by the social context (5,40,41). However, some researchers have described the process of becoming a mother as time-dependent, in which the mother's evaluation of her care-giving ability changes through the first year and becomes more positive as the infant grows older and as the mother seeks a state of normalcy (30,42,43). There are indications that this time-dependent process includes initial feelings of profound responsibility for the infant's health and well-being (30,44), in which the mother may undertake a care-giving role similar in character to that of the NU staff (30). It is also suggested that with time and confidence, life becomes more normal as the mother becomes acquainted with her infant, her feelings for the infant grow deeper (30,44) and she can perceive her family as a unit (44). These adjustments and improvements in confidence towards the infant and family function (45) may be signs of a occurring developmental process of 'becoming a mother'.

Much attention has been paid to the psychological distress or trauma following a preterm birth. As preterm infants, especially the very preterm, are

more diseased-prone and in greater need of re-hospitalisation and medical care at outpatient clinics (46,47), the anxiety about the infant's medical condition is not over after discharge from an NU. It is suggested that psychological distress/problems do not decrease with time (48,49) and that this depressive state is associated with social isolation, post-traumatic symptoms and feelings of guilt persisting several years after the birth (48,50). Moreover, although Pridham, Lin and Brown (42) concluded that mothers of preterm infants viewed their care-giving more positively with time, these authors also showed that mothers who were depressed rated their care-giving experience as worse. Altogether, these findings relate to the interactional behaviour in the mother-infant dyad.

It is hypothesised that mothers of preterm infants experience 'maternal identity' later than mothers of term infants (51) and that if a mother perceives her interaction with her preterm infant as poor, this may hamper the development of a secure and satisfying mother-infant relationship and diminish her experience of maternal identity (51,52). In this context, it is suggested that even though mothers of preterm infants more often exhibit controlling and less sensitive behaviour than mothers of term infants (52-54), these behaviours are independent of the behaviour of the infants and that there is no difference in behaviour between preterm and term infants (54). Other researchers have suggested that a 'compensatory parenting style' and a family function of 'enmeshment', may be prevalent in families of preterm infants (48,55,56). These parenting roles indicate the mothers' needs to 'compensate' their infants for their neonatal experiences and that parents of preterm infants have more difficulties in establishing an interdependent relationship (55,56).

Feeding of preterm infants in a neonatal unit

The breastfeeding behaviour of preterm infants is a maturational process where positive learning experience and a supportive context enhance the infants' ability to breastfeed at a lower postmenstrual age (57). A supportive context is suggested to include the following: early skin-to skin contact should be encouraged; the physical environment should be calm and undisturbing; the mother should be shown how to help her infant to maintain a position; and the nurse should stay near the mother in order to observe and describe how the infant communicates and needs to be supported (58). During the time from birth until the infant can be breastfed exclusively or partially, the mothers who want to breastfeed need to express their breast milk by pumping, many times a day (59). Initially, the infants are fed their mother's breast milk (or donor milk or formula) by gavage feeding. As breast milk is beneficial for nutritional, immunological and cognitive outcomes in infants, with more positive effects in preterm infants (60,61), efforts are

made to help and encourage more mothers of term and preterm infants to breastfeed (62,63).

The question of how to optimise the transitional process, emotionally and physically for the mother and her infant, from gavage feeding alone to breastfeeding alone, has not been thoroughly investigated. Recent research has shown that breastfeeding can be initiated when the infant is physiologically stable, despite its gestational age (57) and that it is more likely that an infant will be breastfed for up to six months of age if he/she receives nasogastric tube supplements instead of bottle supplements (64). However, the transitional process has been, and still is, regulated by a diversity of non-evidence-based guidelines and care routines such as that the infant should be of a certain gestational age when breastfeeding is initiated (65,66), that the infant should tolerate full oral feeds before initiating breastfeeding (67) and that the infant should be weighed before and after breastfeeding (test-weighing) in order to assess the consumed intake (68). Scheduled feeding is most often the policy, although various alternatives have been described (69). Few attempts have been made to assess the effects of these care routines on the breastfeeding duration or from the parents' perspectives. In addition, in mothers of term infants, there have been numerous studies on how mothers experience breastfeeding emotionally (7,8,70,71). Among mothers of preterm infants, low-birth-weight infants and infants nursed in an NU, comprehensive descriptions are lacking.

Breastfeeding duration in term and preterm infants

We can assume that from the time that humans evolved into a separate species infants were fed on mothers' milk, as breasts are designed to deliver milk to babies. With time, and in relation to parenting, the cultural values and norms have changed. From the agricultural revolution, through the years of industrialisation, parents have adapted to the changes in the cultural and economic environment, which have implicitly affected the parenting behaviour and breastfeeding (9,72). Thus breastfeeding is both a biologically and culturally dependent behaviour.

The duration of breastfeeding in developed countries among term infants varies depending on the infant sample and setting. In studies on national samples (including preterm infants) in Norway and Sweden, 70-80% of all infants have found to be breastfed at six months (73-75). In other European countries and in the US, Canada and Australia, the proportion of infants breastfed at six months ranges from 20 to 50% (76,77).

Most studies on the breastfeeding duration of 'preterm' infants have enrolled infants on the basis of their birth-weight, which entails an overrepresentation of infants with intrauterine growth restriction, in whom problems with transitioning to the breast might be different from those in infants born

immature. In addition, long-term studies are rarely performed. In a Norwegian study of preterm infants, the breastfeeding rates at 3, 6 and 9 months of age were 54%, 29% and 25%, respectively (78). In Canada, it was found that 46% of the preterm infants were breastfed at 2 months of age and 19% at 8 months (79). A study in Finland and Germany showed that among infants born at 32-36 gestational weeks (gw), 40% of the Finnish infants and 10% of the German infants were breastfed at 5 months of age. In the very preterm (VPT) infants (< 32 gw), less than 10% were breastfed at 5 months of age in both countries (80).

Factors associated with breastfeeding duration

Many studies have been undertaken with the aim of investigating factors associated with weaning in term infants. In a literature review, Dennis (81) concluded that women who had lower education, were younger, were poor/less well financially situated, or smoked were least likely to initiate breastfeeding and continue to breastfeed. In addition, low confidence and lack of a supportive network decreased the likelihood of breastfeeding.

In preterm infants, a few studies have yielded similar results concerning the association between non-initiation/shorter duration of breastfeeding and low maternal education, lower maternal age, lack of insurance, low net income, and smoking (79,82-84). Other factors that have been reported to be associated with non-initiation/shorter duration of breastfeeding in preterm or high-risk infants are a lower birth weight or gestational age (78,85), although opposite results have been obtained (84). The findings concerning the effect of a prolonged oxygen need on breastfeeding behaviour have been contradictory, some studies indicating an increased risk for earlier weaning (78,86), and others a decreased risk (83) or no effect on the breastfeeding duration (84). Additional barriers to breastfeeding in mothers of preterm infants include: conflicting advice from staff; maternal concern as to whether the infant is consuming enough breast milk by breastfeeding alone; experienced insufficient milk supply; experienced compromised health status in the infant; and maternal emotional disturbance or experienced problems with the infant's breastfeeding behaviour (67,87-89).

Starting point for the studies

Most research in the area of breastfeeding in preterm infants has focused on nutritional aspects of breastfeeding or on explanatory factors for non-initiation of breastfeeding or weaning after a short breastfeeding period. Further, the studies have most often been made on small, non-population-based samples. Thus, large population-based studies on the breastfeeding

duration in preterm infants are lacking. As socioeconomic status (SES) has been shown to be associated with the incidence of preterm delivery and with breastfeeding duration in international studies, it seemed of interest to investigate the relationship between SES and breastfeeding duration in more affluent societies with a high level of welfare and low income-inequality.

Little research has sought to explore and describe the emotional experiences of breastfeeding in mothers of preterm infants. Furthermore, as feeding is an interactional activity in the mother-infant dyad and a major component of the infant care, the process of breastfeeding ought not be explored without also addressing the issue of mothers' experiences in becoming a mother. A broad perspective might be particularly important when exploring less investigated areas.

Aims

Overall aim

To increase the knowledge and understanding of the processes of breastfeeding and 'becoming a mother' in mothers of preterm infants.

Specific aims

- To explore how mothers of very preterm infants experience breastfeeding and 'becoming a mother' up until discharge of the infant from the NU (Study I)

- To explore how mothers of very preterm infants experience breastfeeding and 'becoming a mother', after discharge of the infant from the NU (Study II)

- To investigate the impact of socioeconomic status on breastfeeding duration in mothers of preterm and term infants (Study III)

- To investigate the effects of disorders of prematurity and socioeconomic status on breastfeeding duration in mothers of very preterm infants (Study IV)

Subjects and Methods

Setting

Among the OECD countries, Sweden is the country with the highest public social expenditure and the lowest level of income inequality (90). The public spending on family benefits is also high in Sweden compared to other OECD countries (91), and these benefits include parental financial benefit for 13 months with 80% of the income and 3 months with 60 SEK/day. In 2004, about 81% of the days were claimed by mothers and 19% by fathers (92). Additional parental benefits are 10 days of paternity leave in connection with the infants' birth and 120 days of temporary parental benefit per child and year, which enables parents to stay home from work when their children are sick. These legislations are considered to be supportive for a long duration of breastfeeding (93).

The cost-free perinatal care reaches almost all mothers, and 93% of primiparous women attend childbirth and parenthood education classes (94). The health care for children is cost-free, with a few exceptions, and includes regular visits to child health centres, which nearly all families attend. This public service is responsible for health promotion as well as health surveillance of infants from birth until school age, and this surveillance enables assessment of breastfeeding up to one year of infant age. In 2004, 98% of all Swedish infants were being breastfed at one week of age, 72% at 6 months and 20% at one year of age (95).

Recruitment and samples

An overview of the studies is presented in Table 1.

Table 1. Study design, data sources and participants

Study	Study design	Data sources	Participants
I, II	Qualitative, descriptive	Individual interviews	25 mothers of very preterm infants
III	Quantitative, population-based	The Breastfeeding database Medical Birth Registry Statistics Sweden	37343 mothers of term infants 2093 mothers of preterm infants
IV	Quantitative, population-based	The Breastfeeding database Medical Birth Registry Statistics Sweden	225 mothers of very preterm infants

Studies I and II

Twenty-five mothers of 26 VPT infants participated in the studies. The mothers were selected through purposeful sampling with the aim of enrolling mothers with different experiences of neonatal care, different social backgrounds, and different experiences of breastfeeding and becoming a mother. The mothers were recruited from seven NUs, geographically spread all over Sweden, three at university hospitals and four at county hospitals. Criteria for inclusion of mothers in the study were that they were Swedish-speaking and had no life-threatening illness or diagnosed mental illness and that their infants were born very preterm (< 32 gestational weeks), with no congenital malformation preventing breastfeeding, no severe illness such as a cerebral haemorrhage grade III-IV, and no chromosome aberration. An additional criterion was that the mothers should have experienced pumping breast milk or breastfeeding during the time at the NU.

The mothers were enrolled in a two-step process. First, the eligible mothers were contacted close to discharge, by a contact nurse working at the unit, who informed them about the study and asked them if they would consent to having specified information sent to the first author (medical information about the infant; whether there were older siblings; marital status; whether the mother was or had been lactating; and the name, address and phone number of the mother). Specified information was obtained from 66 mothers. In the second step, the first author made a continuous selection of potential interviewees. A letter with information was sent to 63 mothers, 2 – 4 weeks after the infant's discharge from the unit. Signed informed consent was obtained from 41 of the mothers. An appointment was made with 26 of

the mothers on the telephone for a subsequent interview. This appointment was regarded as part of the selection procedure. One of these mothers was visited twice at home but was not at home on either of these occasions. The 15 mothers who consented to be interviewed but were not, were talked to. Some of these mothers did not want to be interviewed and others gave consent to be contacted at a later time if more interviews were needed. The enrolment of mothers started in January 2001 and ended in May 2003 and the final sample consisted of 25 mothers.

At discharge of the infants, 18 mothers were breastfeeding exclusively, four were breastfeeding partially and three had weaned. Of the 18 mothers who were breastfeeding exclusively, five were still breastfeeding exclusively (all at the breast, postnatal age (PNA) 3-6.5 months at the time of the interview, eight where breastfeeding partially (6 at the breast and two by bottle, PNA 2.5-11 months), and five had weaned their infants (PNA 8-17 months). The latter five mothers had been breastfeeding for 2-11 months. Of the four mothers who were breastfeeding partially at discharge, one was still breastfeeding partially at the time of the interview (at the breast, PNA 6 months) and three had weaned (PNA 7-12 months). The latter three mothers had been breastfeeding for 3-6 months. The characteristics of the mothers and infants are presented in Table 2.

Table 2. Characteristics of the mothers (n=25) and infants (n=26) of studies I and II.

	n
Parity	
Primiparous	15
Multiparous	10
Mother's age, years	
<24	2
24-28	6
29-33	11
>33	6
Marital status	
Single parent	1
Cohabiting	24
Occupations	
Managers/Professionals	8
Technicians and associate professionals	4
Clerks	3
Service workers/Shop sales workers/ Elementary occupations	8
Unemployed	2
Mode of delivery	
Vaginal	10
Caesarean	15
Level of hospital care	
University hospital	10
County hospital	15
Infant's gestational age at birth, weeks	
<28	9
28-31	17
Infant's birth weight, g	
<1000	9
1000-1500	6
>1500	11

Studies III and IV

The subjects of studies III and IV were obtained by matching personal identity numbers of infants in the breastfeeding databases in the Child Health Service (CHS) of the county of Uppsala and of the county of Örebro with the corresponding identity numbers in the Medical Birth Registry (MBR) (Fig.1)

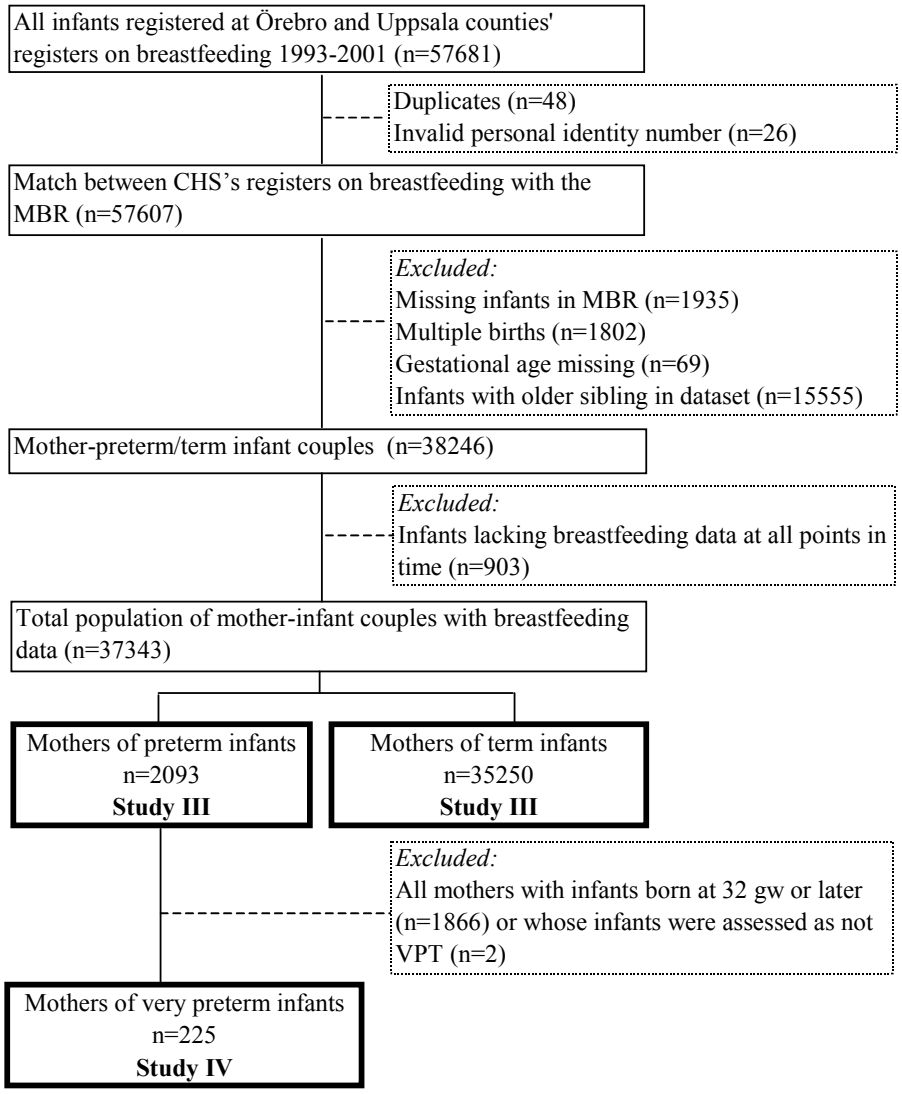

Figure 1. Samples in studies III and IV

Demographic and socioeconomic characteristics of parents of term and preterm infants (study III) and of VPT infants (study IV) are presented in Table 3. Note that the VPT infants are a subgroup of the population of preterm infants.

Table 3. Demographic and socioeconomic characteristics of parents of term (n=35250), preterm (PT; n=2093) and very preterm (VPT; n=225) infants.

	Term, ≥ 37gw		**PT, < 37gw**		**VPT, < 32gw**	
	n	**%**	**n**	**%**	**n**	**%**
Maternal educational level						
Compulsory school or less	4952	(14%)	338	(17%)	41	(19%)
Upper secondary school	18281	(54%)	1087	(53%)	112	(51%)
Higher education	10922	(32%)	612	(30%)	67	(30%)
Maternal unemployment benefit	8585	(24%)	504	(24%)	50	(22%)
Social welfare	4689	(13%)	323	(15%)	32	(14%)
Equivalent disposable income						
Lowest quartile	13264	(38%)	753	(36%)	78	(35%)
2nd lowest quartile	9981	(28%)	554	(26%)	55	(24%)
2nd highest quartile	8821	(25%)	578	(28%)	69	(31%)
Highest quartile	3158	(9%)	207	(10%)	23	(10%)
Single mother	1877	(6%)	136	(7%)	9	(4%)
Smoking at first antenatal care visit	5111	(15%)	337	(18%)	40	(20%)
Mother not born in Sweden	5521	(16%)	316	(15%)	29	(13%)
Multiparous	15136	(43%)	706	(34%)	80	(36%)
Mother's age, years						
- 23	5943	(17%)	384	(18%)	31	(14%)
24 - 28	12313	(35%)	699	(33%)	55	(24%)
29 - 33	11008	(31%)	597	(28%)	83	(37%)
34 -	5986	(17%)	413	(20%)	56	(25%)
Paternal educational level						
Compulsory school or less	5541	(16%)	355	(18%)	31	(14%)
Upper secondary school	18442	(54%)	1100	(54%)	122	(56%)
Higher education	10110	(30%)	565	(28%)	66	(30%)

gw = gestational weeks

In study III, the population consisted of two cohorts, mothers of preterm infants and mothers of term infants. Among the preterm infants, the gestational age at birth ranged from 22 to 36 weeks, with a median (inter quartile range) of 35 (1.0) and they weighed 453-4927 g at birth with a mean (± SD) of 2526 ± 669 g. The term infants weighed 1370-6530 g with a mean (± SD) of 3609 ± 491 g.

In study IV, the population consisted of 225 VPT infants, of whom 58 were born at < 28 weeks. Their median (inter quartile range) gestational age at birth was 29 weeks (2.0). The infants weighed 453-2855 g at birth, with a mean (± SD) of 1302 ± 430 g. Characteristics of these infants, including size at birth and neonatal disorders, are presented in Table 4.

Table 4. Characteristics of the very preterm infants in study IV (n=225)

	n	**(%)**
Light for gestational age		
<-1.0 SDS	48	(22%)
-1.0 to +1.0 SDS	143	(64%)
>+1.0 SDS	32	(14%)
Short for gestational age		
<-1.0 SDS	33	(20%)
-1.0 to +1.0 SDS	100	(60%)
>+1.0 SDS	33	(20%)
Apgar score < 7 at 5 min	23	(10%)
Caesarean section	144	(64%)
Malformation	11	(5%)
Respiratory disorders	85	(38%)
Sepsis	44	(20%)
Sequelae[a]	40	(18%)

[a] Sequelae: bronchopulmonary dysplasia, intraventricular haemorrhage, retinopathy of prematurity, necrotising enterocolitis or periventicular leucomalacia
SDS = standard deviation score

Data collection

Studies I and II

All interviews were conducted in the mothers' homes by the first author. All interviews were audiotape-recorded and lasted 40 minutes to 3.5 hours, with a mean of 100 minutes. The total interview time was 41.5 hours, which amounted to 1002 pages (double-spaced).

The interviews started with broad questions on how they had experienced breastfeeding and being a mother up to the point of the interview. An interview guide was used, with questions on the mothers' concerns, their identified obstacles and resources, the strategies used, and the consequences of these experiences. The interview guide was revised during the course of the data collection and analysis, so that categories and dimensions (properties) of categories could be found and more fully explored.

Studies III and IV

Data on breastfeeding

Breastfeeding data were obtained from the CHS registers of breastfeeding in the counties of Uppsala and Örebro. The data were derived from the scheduled visits at 2, 4, 6, 9 and 12 months at the CHCs, where more than 99% of all newborns were enrolled. The mothers were asked at each visit whether the infant was breastfed and the CHC nurse recorded the answer. During 1993-1996, data on breastfeeding were not recorded at 9 and 12 months for the infants in Örebro county.

Breastfeeding is defined by The Swedish National Board of Health and Welfare as being fed with breast milk, exclusively or partially, and pays no regard to the method used for intake. In this study, mothers who were breastfeeding (exclusively or partially) were compared with those not breastfeeding at postnatal ages of 2, 4, 6, 9 and 12 months. Missing data on occurrence of breastfeeding were replaced by 'no breastfeeding' if the mother had not been breastfeeding at the point in time before the missing value. Data were not replaced for mothers who breastfed and subsequently lacked data.

Data on socioeconomic status and related confounders

As there is a general consensus that income, employment status, occupation and education reflect SES better when considered together than when considered separately (96), maternal education, maternal unemployment benefit and two income measures, namely social welfare and equivalent disposable income of the household, were chosen to represent SES. All data obtained from Statistics Sweden and the Medical Birth Registry (MBR) on SES and confounders refer to the year in which the infant was born. The origin, definition and operationalisation of data on SES and confounders are presented in Table 5. There were no missing data on SES (<0.001%), except for maternal education (3% in study III and 2.2% in study IV). Missing data on confounding factors concerned paternal education (3% in study III and 2.6% in study IV), smoking at first antenatal visit (5.5% in study III and 11.5% in study IV) and cohabitation (7.6% in study III and 11.5% in study IV).

Table 5. Definition and operationalisation of socioeconomic data and confounders.

Variables	Origin	Definition and operationalisation
Socioeconomic status		
Maternal educational level	SCB	Educational level. Seven educational levels were categorised into 3 levels: Compulsory school or less, Upper secondary school, or Higher education.
Maternal unemployment benefit	SCB	Financial support when unemployed. Continuous variable dichotomised as yes/no.
Social welfare	SCB	Financial assistance to secure a reasonable standard of living. Continuous variable dichotomised as yes/no.
Equivalent disposable income of the household	SCB	The disposable income is the sum of all taxable income and tax-free income (e.g. study support, state child benefit, housing allowance and social welfare) minus tax and additional negative transfer (e.g. refunded study support and paid alimony). This disposable income is subsequently adjusted to household size using the Statistics Sweden Equivalence Scale. The scale is based on the Swedish norms of social welfare and measures the cost of providing an equivalent standard of living for households that differ in size and age. The continuous data in Swedish currency were index adjusted to the prize level of the year 2001 and categorised into four quartiles based on all households in Sweden for each year from 1993-2001.
Confounders		
Cohabitation	MBR	Living with the infant's father at first antenatal visit or not.
Smoking at first antenatal visit	MBR	Smoking or not.
Maternal age	MBR	Mother's age at infant's birth. Categorised as: <24, 24-28, 29-33 and >33 years.
Paternal educational level	SCB	see: Maternal educational level.
County	RB	Living in, and attending a CHC, in the county of Uppsala or Örebro.
Gestational week at birth	MBR	Used as a confounder only in study III, the preterm group. Categorised as 22-27, 28-31 and 32-36 weeks

SCB = Statistics Sweden, MBR = The Swedish Medical Birth Registry,
CHC = Child Health Centre, RB = The Child Health Service Registry on breastfeeding in the counties of Uppsala and Örebro.

Data on prematurity, size at birth and neonatal disorders

In study IV, data on the infants were obtained from the MBR. The definition and operationalisation of perinatal data are presented in Table 6.

Table 6. Definition and operationalisation of perinatal data

Variables	Definition and operationalisation
Prematurity	Gestational weeks at birth. Categorised as: 22-27 and 28-31.
Size at birth	Light and short for gestational age were assessed from data on gestational age, birth weight (g) and birth length (cm) according to reference standards of Niklasson et al. (97) to obtain standard deviation scores (SDS). The SDS was subsequently divided into 3 categories: <-1 SDS, -1 to +1 SDS and >+1 SDS.
Neonatal disorders	
Clinical status at birth	Data on Apgar score (0-10 points) at 5 minutes were used. Categorised as: < 7 and ≥ 7 points.
Malformation	Data on malformations were reported as diagnosis numbers according to ICD9 and ICD10. In the chosen variable, minor malformations[a] were excluded. In addition, PDA (patent ductus arteriosus) was excluded as a malformation. Categorised as yes/no.
Respiratory disorders	All infants with a reported diagnosis of respiratory distress syndrome, interstitial emphysema or pneumothorax, according to ICD9 and ICD10, were categorised as having a respiratory disorder. Infants without reported diagnose of such disorders were categorised as not having a respiratory disorder.
Sepsis	All infants with a stated diagnosis of sepsis, according to ICD9 and ICD10, were categorised as having sepsis. Infants without a reported diagnosis of sepsis were categorised as not having sepsis.
Sequelae	All infants with a reported diagnosis at discharge of bronchopulmonary dysplasia, intraventricular haemorrhage, retinopathy of prematurity, necrotising enterocolitis or periventicular leucomalacia, according to ICD9 and ICD10, were categorised as having a sequelae. Infants without reported diagnosis of such disorders were categorised as not having a sequelae.

[a] Minor malformations: preauricular fibroma, cryptorchidism, hydrocele of the testis, congenital hip dislocation, naevus

Data analyses

Studies I and II

The interview data were analysed with open coding, which involved examining words, phrases and paragraphs of the transcripts. All data were coded into as many categories and properties as possible, which were compared. The process moved back and forth between data and emergent patterns. These alternations between data and emergent patterns also meant that the open coding was gradually replaced by selective coding. The first author performed the coding, but one other member of the research team also read the interviews. Ideas formed during this process were written down as memos, "short stories" and "maps", as a way to understand how categories/indicators were linked to or separated from each other. The data analysis was based on the grounded theory approach (98-100). However, unlike grounded theory, where the focus is on the presentation of concepts and theories, the main emphasis was on the detailed descriptions.

Studies III and IV

In studies III and IV, SPSS (Statistical Package for the Social Sciences) was used for the analyses. Characteristics of the populations are presented as percentages and descriptive statistics (e.g. median IQR and means±SD). Differences in breastfeeding frequency between groups at postnatal ages of 2, 4, 6, 9 and 12 months were analysed with the Chi-square test with a two-sided 5% level of significance, and with Logistic regression, presented as odds ratios (OR) with 95% confidence intervals (CI).

In study III, logistic regression (enter model) was used to investigate the effect of SES on weaning before the infant age of 6 months. In the first step, the effect of each of the SES factors on weaning was investigated. In the second step, all socioeconomic factors were mutually adjusted for one another. Thirdly, adjustments were made for confounding factors. The choice of confounders entered into the model was based on theoretical assumptions and subsequent analyses. Investigated factors were assessed as confounders a) if they were associated with breastfeeding duration and b) if the factor influenced any of the socioeconomic factors with a more than 10% deviation from the unadjusted estimate after the introduction of the factor into the model. Smoking, cohabitation, maternal age and paternal education have previously been shown to be strongly associated with SES (83,101,102) and with breastfeeding duration (74,103,104), and were assessed as confounders, together with 'county'. In the preterm group adjustments were also made for

gestational week (three subgroups), in order to investigate the possible impact of degree of prematurity in relation to SES. In study III the Cox proportional hazard model was used in secondary analyses to obtain the hazard ratio for being weaned at 2-12 months in relation to each of the socioeconomic factors individually. In these analyses, Kaplan-Meier hazard curves were scrutinised visually to consider the proportional hazard assumption in the Cox model. The hazard function represents the risk of being weaned assuming breastfeeding thus far.

In study III the differences in the risk of weaning between mothers of preterm and those of term infants, was analysed through multivariate analyses, in which SES, confounders and the variable preterm/ term were included. The odds ratio for this latter variable was used as an estimate of increased risk for weaning before 2, 4, 6, 9 and 12 months. In addition, the interaction between preterm birth and SES regarding weaning before each point in time was analysed by multiplying the variable preterm/term by each of the socioeconomic factors in the bivariate analyses (dichotomised). The product was added to a regression model in which it was possible to detect an interaction effect.

In study IV, logistic regression (enter model) was used to investigate the effects of SES, prematurity, size at birth, and neonatal disorders, on weaning before the infant postnatal age of 2, 4, 6, 9 and 12 months. In the first step, the effect of each of the variables on weaning was investigated and presented as odds ratio with 95% confidence interval. The impact of SES on breastfeeding was also investigated in multivariate analyses in which socioeconomic factors were investigated simultaneously, with adjustments for confounders. The choice of confounders was assessed as described above for study III.

Ethical considerations

The first studies (paper I and II) were approved by the medical research ethics committee at Uppsala University (Dnr 00-428). To safeguard the principle of autonomy, associated with the respect for the individual's dignity, integrity and vulnerability, the eligible women were informed verbally and by written information about the study. Participation in the studies was voluntary and the women were asked 1) if they would consent to having specified information sent to the first author (RF) and 2) if they would consent to be interviewed. Those women who gave their signed consent were made aware of their right to refuse to having specified information sent, not to answer questions, or to withdraw at any time, without negative conse-

quences. In addition, data on mothers (e.g. demographics) were presented as group values. Fictitious names were used in order to secure the women's anonymity when presenting quotations and descriptions. Only the first author (RF) knew the true names of the women.

Studies III and IV (paper III and IV) were also approved by the medical research ethics committee at Uppsala University (Dnr 02-357). A register study in which different registers are merged may entail a violation of the individual's integrity. To prevent this, the applied regulations regarding merging of other registers with the MBR, were used. This meant that the researchers had no access to the individuals' personal identity numbers at any time, and were thus not able to identify any individual.

Results

Study I

The findings concerning the period of care at the neonatal unit (Paper I) indicated the importance of the quality of social bonds with the infant, father, staff and other mothers at the NU, for "becoming a mother" and experiencing mutually satisfying breastfeeding (reciprocal), in which a balance in needs was perceived. The qualities were described as trustful or distrustful, characterized by accompanying feelings of pride/trust or shame/distrust. Social bonds were affected not only by the interpersonal interplay between the mother and the infant, father, staff and other mothers at the NU, but also by the public environment and care routines.

The loss of the infant and the emotional chaos

Mothers described how they grieved over the loss of the unborn infant, the loss of the 'normal' infant and the lost "natural connection" and how they tried to mentally prepare for a possible greater loss, as they believed the infants could die. The environment signalled life and death and was described as making a time travel into the future. The unexpected delivery and the overhanging threat of the infant's death led to emotional chaos in which the mothers felt frightened, sad, disappointed and worthless. In this emotional chaos, the mothers 'put life on hold', a strategy whereby they blocked their emotions. This resulted in emotional alienation, in regard to their own personal needs, from their infants or from being mothers.

Separation – a perceived indication of being unimportant as a person and a mother

Separation of the mother from the infant mediated insecurity in the self and in the maternal role for two major reasons. Firstly, the separation resulted in feelings of being unimportant to the infant and being just a visitor. The mothers did not experience themselves as primary caregivers as they normally are. Secondly, the enforced separation implied that the mothers' emo-

tional need to be close to the infant could not be fulfilled. The separation entailed a burden that was additional to the experienced emotional chaos, but was also a consequence of it, since the mothers were not capable of persisting and arguing their case in the presence of this emotional chaos.

Critical aspects in the process of becoming more than a physical mother

The behaviour of the staff became of great importance for becoming a mother and for experiencing reciprocal breastfeeding. The mothers' caretaking of their infants had to be negotiated with the individual staff members in a continuous wish/demand – approval situation, in which the mothers experienced both trustful and distrustful relational bonds with individual members of the staff. When respectful and supportive behaviour was experienced, the mothers felt secure and capable and felt like good mothers, with consequent feelings of pride and enhanced self-esteem. However, the mothers also experienced disrespectful and oppressive behaviour on the part of the staff, which resulted in feelings of frustration, insecurity and shame.

In the early phase, mothers described the physical closeness of skin-to-skin contact or breastfeeding, from three conformational aspects: as a sign of the infant's vitality and strength, as a step towards normality, and as an experience of being an important person. During this phase breastfeeding was not really considered as breastfeeding as such but as a way of being together, where the main purpose was reciprocal pleasure, comfort and attachment.

A change in the parental balance was experienced when the infant's medical condition improved or when the infant was transferred from the intensive-care room/unit to the intermediate-care room/unit. Greater focus on growth and breastfeeding meant that some mothers felt 'exclusion' of the father, and some mothers felt lonely and insecure in breastfeeding, while others felt pride, as they became "something more than the father". An altered relationship with other mothers coincided at this point in time, when some sensed the importance of other mothers when they started to breastfeed, as they could share their experiences and help each other. Other mothers described the insecurity and shame they felt when they tried to breastfeed in front of more successful mothers.

With time, mothers perceived a staff policy of 'training' infants to breastfeed as an outcome of the staff's opinion that more attempts at breastfeeding would make the infant breastfeed exclusively more quickly. Care routines such as scheduled feeding and test-weighing were considered by some mothers as necessary, while others felt that they were being forced to disre-

gard their infants' and their own needs of closeness and attachment. Breastfeeding became more of a one-directional activity that was regarded as a task and a duty (non-reciprocal) in which the emotional needs were dismissed. For most mothers the last part of the hospital stay was characterised as a trial and error period. When success was perceived, the mothers felt secure and were proud of being such good mothers. But when the infants did not wake up when it was time for breastfeeding, were "angry" or did not consume as much as before, some mothers felt frustrated, unsuccessful, rejected, or ashamed of not being a mother who could satisfy and breastfeed her infant.

Study II

After discharge from the NU, the process of becoming a mother and breastfeeding was represented by pendular changes in the emotional state, in the maternal-infant bond, and in the experience of breastfeeding. The mothers' emotional manifestations in this process varied and alternated between feeling emotionally exhausted and feeling relieved, experiencing an insecure and a secure bond, and perceiving breastfeeding as being non-reciprocal and being reciprocal. Regarding the maternal-infant bond, an imbalance in the mother-infant relationship and experience of shame or distrust indicated an insecure maternal-infant bond, whereas a balanced mother-infant relation and feelings of pride and trust were signs of a secure bond.

The emotional state

The pendular changes in the emotional state alternated between feeling emotionally exhausted and feeling relieved. The emotional exhaustion was a consequence of the emotional energy spent by the mothers during the infants' stay at the NU. This exhaustion led to additional feelings of shame, as they were not able to live up to the expectations of being a "good mother". The societal expectations and those of friends and families fortified the sense of failure. Mothers also described feelings of relief in that they had gone through and managed a difficult time, in which the discharge was experienced as somewhat of a medical approval of themselves, as parents, and their capability of taking care of their infant. When the mothers considered their infants to be healthy, the feeling of relief was reinforced. But when they had fears about the infant's health and possible future medical condition, they felt anxious and worried.

The maternal-infant bond

After discharge, the mothers balanced between a state of sustained subordination and a self- governed maternal role. Even though there were no staff controlling or caring for them any more, the mothers still acted as if they were kept under surveillance. This was indicated by the mothers' attempts to fulfil the expectations of being a good mother or by imitating the staff in the performance of their care-taking. By this mimicry, the infants became objects and the mothers experienced themselves as replaceable as caregivers and as mothers, which made the mothers insecure in their relationship with their infants. But mothers also described a self-governed role, in which they experienced their infants as becoming more their own and felt that they could do things in the way they wanted to. In addition, mothers described feelings of attachment and feelings of confidence, as they felt that they were the ones who could fulfil their infants' emotional needs. This was indicated by descriptions of how mothers 'compensated' their infants for the pain and loneliness and the "tough start" at the NU.

In the pendulating process of maternal-infant bonding, the mothers' experience of attunement was crucial, and this was described from two aspects. First, the understanding of the infant's signals and behaviour. Early after the discharge from the NU, mothers felt insecure in how to interpret their infants. With time they became familiar with the infants' behaviour and learnt to take care of them in a way they found suitable, which increased their confidence and pride in themselves as being mothers. Furthermore, when the infants signalled a positive recognition, the mothers felt acknowledged and loved. Absence of such confirmative signals, regardless of the infant's developmental state, led to feelings of insecurity.

The second aspect of attunement, the identification of the infant with oneself was described as a balance in needs. A secure bond was perceived when the mother experienced interdependency. This was indicated when the mother positioned herself in the infant's role and still did not embrace the standpoint of the infant at the expense of her own beliefs, values and feelings. Other mothers placed emphasis on the self and did not express identification with the infant, indicating an insecure bond in which the mother and infant were isolated from each other. In the identification of the infant and of mother, the outside relations of the mother with the family, friends and health care became important. Good quality in these relations was crucial for the establishment of secure bonds, as some mothers had experienced rejection of themselves as a mother of her infant by the NU staff. Mothers described how they gained confidence and felt pride in themselves when they were recognised as the mother or when other people made positive remarks about their infants. When mothers received negative remarks about their infants, feelings of shame were generated.

Breastfeeding

After discharge, mothers experienced that the norm that a "good mum breastfeeds" had become integrated within themselves. The regime at the NU with its focus on breastfeeding as a responsibility and the societal values made it clear that the norm of prolonged breastfeeding was not discriminative with regard to prematurity. In those mothers who could not live up to the expectations of the health care staff and of their friends and families, feelings of shame arose when they weaned from breastfeeding.

The mothers' experiences of the infants' behaviour and their ability to understand and respond to their infants' signals were crucial for the question of whether they experienced breastfeeding as reciprocal or non-reciprocal. This was described as a process in which they gradually learned how their infants wanted the breastfeeding to be. The infant's response to breastfeeding also contributed to the pendular emotions. The infant's signals that he/she was hungry, enjoyed being breastfed, and was satisfied after breastfeeding became acknowledgements of successful breastfeeding. But when the mother felt that the infant was dissatisfied and difficult to please, she felt a lack of confidence or shame.

In addition, mothers who experienced trust in themselves in being mothers and were able to focus on the infant and his or her signals and needs, learned to respond to their infants more easily, which facilitated reciprocal breastfeeding. The possibility of focusing on the infant and responding to his/her signals was also related to the life situation at home, with cleaning and taking care of other children, which sometimes impaired the reciprocity of breastfeeding as the mother could not always sit and relax and just be with the new infant. In the pendular experiences of breastfeeding, the balance in needs was also of vital importance.

In order to experience reciprocal breastfeeding, the mothers' own needs and their infants' perceived needs had to be acknowledged. Despite the construct of these experienced needs, a balance was obtained when the mothers felt that the needs were fulfilled. In some mothers this was indicated when they 'managed to breastfeed', in accordance with their wishes. Others wanted to breastfeed, as they considered breastfeeding to be a profound symbol of motherhood or a way to establish dependency. When an imbalance in needs was perceived and the mothers continued to breastfeed, non-reciprocal breastfeeding was experienced. This imbalance was described as submissiveness to the infant, in which the mother gave up the self out of loyalty or fear and embraced the standpoint of the infant, or society, at the expense of her own beliefs and feelings.

Studies III and IV

Breastfeeding duration

The results from study III showed that significantly fewer mothers of preterm infants breastfed at postnatal infant ages of 2, 4, 6, 9 and 12 months in comparison with mothers of term infants. Regarding the breastfeeding duration in mothers of very preterm infants (IV), there were no differences at each postnatal age between mothers whose infants were with infants born at 22-27 weeks and those born at 28-31 weeks. Figure 2 shows the breastfeeding frequencies at 2, 4, 6, 9 and 12 months among mothers of infants born at > 36 gestational weeks (n=35250), 32-36 weeks (n=1866), and < 32 weeks (n=225). A significant difference was found between all groups at 2, 4, 6 and 9 months. At 12 months, the rate of breastfeeding was significantly lower in mothers of infants born at 32-36 weeks than in those of infants born at >36 weeks. There was no difference in breastfeeding frequency between the mothers of infants born at < 32 weeks and those born at a later gestational age.

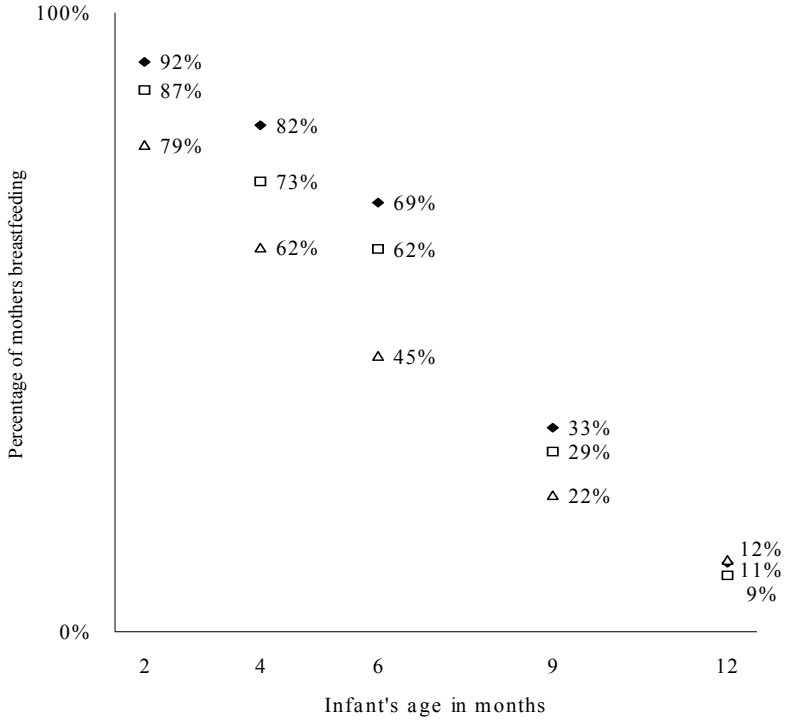

Figure 2. Breastfeeding frequencies at postnatal ages of 2, 4, 6, 9 and 12 months. Symbols: ◆ mothers of infants born at > 36 weeks; □ mothers of infants born at 32-36 weeks; △ mothers of infants born at < 32 weeks.

Association between socioeconomic status and weaning in mothers of term and preterm infants (Study III)

The proportion of mothers of term and preterm infants who had weaned before the infant postnatal ages of 6 months in relation to SES is presented in Table 7 (paper III).

Table 7. Proportion of mothers of term and preterm infants who had weaned from breastfeeding before an infant postnatal age of 6 months in relation to socioeconomic status.

	Term, ≥ 37gw		**Preterm, < 37gw**	
	n	**%**	**n**	**%**
Maternal educational level				
Compulsory school or less	2345/4885	(48%)	191/334	(57%)
Upper secondary school	6271/18086	(35%)	481/1077	(45%)
Higher education	1660/10747	(15%)	130/601	(22%)
Maternal unemployment benefit	3105/8475	(37%)	228/498	(46%)
No unemployment benefit	7519/26287	(29%)	599/1565	(38%)
Social welfare	2031/4599	(44%)	184/317	(58%)
No social welfare	8594/30164	(29%)	644/1747	(37%)
Equivalent disposable income				
Lowest quartile	4567/13049	(35%)	350/740	(47%)
2nd lowest quartile	3203/9872	(32%)	217/550	(40%)
2nd highest quartile	2334/8722	(27%)	199/570	(35%)
Highest quartile	521/3120	(17%)	62/204	(30%)

In the bivariate (unadjusted) in study III it was found that lower maternal education, maternal unemployment benefit, social welfare and lower equivalent disposable income in the household were individually associated with weaning before 6 months in mothers of preterm and term infants. The analyses of the Cox proportional hazard model showed identical findings; that is, all socioeconomic factors were individually associated with breastfeeding duration up to one year of infant's age.

Subsequent logistic regression analyses, in which mutual adjustments were made for all socioeconomic factors, showed that lower maternal education, unemployment benefit received by the mother, and social welfare in the household, were all independently negatively associated with breastfeeding at 6 months in mothers of term infants. In addition, a larger proportion of mothers of term infants whose equivalent disposable income was in one of the two middle quartiles weaned before 6 months, compared to mothers in the highest quartile. In mothers of preterm infants, only lower maternal education and receiving social welfare remained significant when mutual ad-

justments were made for all socioeconomic factors. Adding confounders to the logistic regression models did not alter the associations between socioeconomic factors and weaning, in mothers of term and preterm infants. In Table 8 the odds ratios for weaning from breastfeeding in mothers of term and preterm infants are presented, after adjustments for confounders.

Table 8. Adjusted odds ratios (OR) for weaning from breastfeeding before the infant postnatal age of 6 months, in mothers of term (n=29931) and preterm (n=1727) infants.

	Term, ≥ 37gw		**Preterm, < 37gw**	
	OR[a]	**(CI)**	**OR[b]**	**(CI)**
Maternal educational level				
Compulsory school or less	2.66	(2.42-2.93)	2.39	(1.62-3.52)
Upper secondary school	1.98	(1.85-2.13)	2.28	(1.72-3.03)
Higher education	1.00		1.00	
Maternal unemployment benefit	1.11	(1.05-1.18)	1.10	(0.86-1.40)
No unemployment benefit	1.00		1.00	
Social welfare	1.32	(1.21-1.44)	1.58	(1.10-2.26)
No social welfare	1.00		1.00	
Equivalent disposable income				
Lowest quartile	1.13	(1.00-1.27)	0.72	(0.47-1.09)
2nd lowest quartile	1.30	(1.16-1.46)	0.88	(0.59-1.32)
2nd highest quartile	1.23	(1.09-1.38)	0.85	(0.57-1.26)
Highest quartile	1.00		1.00	

[a] adjusted for maternal educational level and unemployment benefit, social welfare, equivalent disposable income, cohabitation, smoking at first antenatal visit, maternal age, paternal educational level and county.
[b] adjusted for a + gestational age at birth

Comparisons between mothers of preterm and term infants regarding the impact of SES on weaning (Study III)

In study III it was found that when adjustments were made for SES and confounders, mothers of preterm infants showed an increased risk of weaning before an infant age of 2 months (adjusted OR 1.70; 95% CI 1.46-1.99), 4 months (1.79; 1.60-2.01), 6 months (1.48; 1.33-1.64) and 9 months (1.19; 1.06-1.34). At 12 months, mothers of preterm infants were not at higher risk of having weaned than mothers of term infants (adjusted OR 1.21; 95% CI 1.00-1.47). The interaction analyses showed that none of the socioeconomic factors was more decisive for weaning from breastfeeding before the ages of 2, 4, 6, 9 and 12 months in mothers of preterm infants than in those of term infants.

Association between SES and weaning in mothers of very preterm infants (Study IV)

The proportion of mothers of VPT infants who had weaned before the infants had reached a postnatal age of 6 months, in relation to socioeconomic status, is presented in Table 9. In the bivariate (unadjusted) analyses in study IV it was found that lower maternal education, maternal unemployment benefit, social welfare and lower equivalent disposable income in the household were individually associated with weaning before 6 months. Similar associations were identified at 2 and 4 months. A lower maternal educational level constituted a significantly higher risk of weaning in bivariate analyses at 9 and 12 months, as did social welfare at 9 months.

In subsequent logistic regression analyses concerning weaning before 6 months, in which all socioeconomic factors were mutually adjusted for and adjustments were made for confounders, social welfare still remained significant, while the effects of maternal education, maternal unemployment benefit, and equivalent disposable income were attenuated and did not reach statistical significance (Table 9). The same results were obtained at 4 months of infants' age. At 2 months, the only factor that remained statistically disadvantageous for weaning was the lowest quartile of equivalent disposable income. As too many mothers had weaned, multivariate analyses were not feasible at 9 and 12 months.

Table 9. Proportions of mothers of very preterm infants (n=186) who had weaned from breastfeeding before the infants' postnatal age of 6 months, with adjusted odds ratios (OR) and confidence intervals (CI)

	VPT infants, < 32 gw			
	n	**%**	**OR[a]**	**(CI)**
Maternal educational level				
Compulsory school or less	30/41	(73%)	2.38	(0.78-7.28)
Upper secondary school	64/112	(57%)	1.63	(0.75-3.52)
Higher education	27/66	(41%)	1.00	
Maternal unemployment benefit	35/50	(70%)	1.85	(0.82-4.17)
No unemployment benefit	88/172	(51%)	1.00	
Social welfare	25/30	(83%)	5.25	(1.27-21.65)
No social welfare	98/192	(51%)	1.00	
Equivalent disposable income				
Lowest quartile	49/76	(64%)	1.09	(0.49-2.43)
2nd lowest quartile	33/55	(60%)	1.27	(0.58-2.78)
The 2 highest quartiles	41/91	(45%)	1.00	

[a] adjusted for maternal educational level and unemployment benefit, social welfare, equivalent disposable income, cohabitation, smoking at first antenatal visit, maternal age, paternal educational level and county.

Associations between prematurity, size at birth and neonatal disorders with weaning in mothers of very preterm infants (Study IV)

In study IV the results showed no association between degree of prematurity, size at birth or neonatal disorders and weaning before a postnatal age of 6 months (Table 10). Bivariate analyses at 2, 4, 9 and 12 months yielded the same results; that is, an adverse effect of perinatal factors did not constitute a risk of weaning.

Table 10. Mothers of very preterm singleton infants (n=225). Odds ratios (OR) in bivariate (unadjusted) logistic regression analyses for weaning from breastfeeding before the infants' postnatal age of 6 months in relation to prematurity, size at birth and neonatal disorders.

	Incidence of weaning		**Unadjusted**	
	n	**%**	**OR**	**(95% CI)**
22-27 gestational weeks	32/58	(55%)	0.99	(0.54-1.80)
28-31 gestational weeks	91/164	(56%)		1.00
Light for gestational age				
<-1.0 SDS	31/48	(65%)	1.58	(0.80-3.11)
-1.0 to +1.0 SDS	75/140	(54%)		1.00
>+1.0 SDS	17/32	(53%)	0.98	(0.46-2.12)
Short for gestational age				
<-1.0 SDS	23/33	(70%)	1.83	(0.79-4.26)
-1.0 to +1.0 SDS	54/97	(56%)		1.00
>+1.0 SDS	19/33	(58%)	1.08	(0.49-2.40)
Apgar score < 7 at 5 min	13/23	(56%)	1.02	(0.43-2.45)
Apgar score > 6 at 5 min	108/193	(56%)		1.00
Malformation	7/10	(70%)	1.93	(0.49-7.67)
No malformation	116/212	(55%)		1.00
Respiratory disorders	46/84	(55%)	0.96	(0.56-1.66)
No respiratory disorders	77/138	(56%)		1.00
Sepsis	27/44	(61%)	1.36	(0.69-2.66)
No sepsis	96/178	(54%)		1.00
Sequelae	24/40	(60%)	1.26	(0.63-2.52)
No sequelae	99/182	(54%)		1.00

[a] Sequelae: bronchopulmonary dysplasia, intraventricular haemorrhage, retinopathy of prematurity, necrotising enterocolitis or periventicular leucomalacia

Discussion

The starting point for the studies was the lack of descriptions of how mothers of preterm infants emotionally experience the process of breastfeeding. As breastfeeding is an interactional activity in the mother-infant dyad, the qualitative studies also included an exploration of how mothers experienced the process of becoming a mother. Of special concern was the lack of knowledge regarding the possible impact of socioeconomic factors, prematurity and neonatal disorders on the duration of breastfeeding in a country with a pro-breastfeeding culture and with high social expenditure.

Hindrances to a trustful mother-infant bond

Our results showed that in order to experience a trustful bond with the infant, the mother needs to feel a mutual identification with the infant, to be able to acknowledge herself as the mother, and to perceive a balance between the maternal and infant needs. Although the mothers had a feeling of relief and a secure mother-infant bond when at home, some mothers suffered from emotional exhaustion and an insecure relationship with their infant. In the following sections four obstacles to the experience of a trustful bond will be discussed.

The separation

The initial separation of the mother from the infant and the lack of a place to stay continuously during the hospital care of the infant signalled an infant-focused care in which the mother's needs as a person and a mother were considered unimportant and where the infant did not need his/her mother, but medically trained professionals and advanced medical care. The separation placed the woman in a subordinate role right from the start, from which she had difficulty in claiming her infant, as she had become a visitor and not the primary caregiver as a mother normally is; findings in accordance with other reports (25,28). In addition, it is suggested that the significance of the feeling and the biological effects of being physically connected to the infant are vital for the 'bonding' process, in which the "power of this attachment is so great that it enables the mother and the father to make the many sacrifices

necessary for their care of their infant" (105, p.4). It may be hypothesised that the separation is an important cause of an experience of insecurity in the mother-infant relationship after discharge, in which feelings of unimportance and of being replaceable indicated isolation, an extreme of an insecure bond that is rarely described.

Experienced loss and lack of mutual identification

It was found that the preterm delivery and the separation entailed experiences of a loss of the unborn infant, loss of the 'normal' infant and a possible even greater loss, that is loss of the infant, in view of the thought that he or she might die. These experiences mediated a sense of distrust, a negative identification, directed towards the self and towards the infant. Some researchers have reported that the experience of the infant as sick and vulnerable may entail a less positive perception of the infant and feelings of stress during the hospital stay (25,26,106), and even up to 1-3 years after birth (48,50). Thus, during the time at the NU, the staff-infant relationship becomes of crucial importance, as the staff have the potential to acknowledge the infants as persons with individual needs and to recognise the positive characteristics of the infants (38,107), which may strengthen the mothers' trust in their infants. In this context, some mothers perceived a lack of acknowledgement and response from their infants after discharge, findings in agreement with other studies (42,108). Thus, the infant's initial vulnerability, the mother's anxiety about the infant's health and development, and of her experience of an inadequate response from the infant, may lead to a compensatory parenting style (48,55,56,108), indicating an insecure mother-infant bond. Efforts by the staff at NUs and CHCs to strengthen the mother's trust in herself as the mother and to make her aware of the infant's response in relation to maturity can thus lead to a more secure mother-infant relationship.

Distrustful mother-staff relationship

One of the main obstacles to a maternal experience of a secure mother-infant relationship during the NU stay and after discharge was a perception of the NU as an institution, with an inhibitive caring style in which feelings of shame were involved. One reason for this effect was that most mothers in our study were separated from their families and friends and thus new and distrustful relations with the NU staff replaced the trustful bonds with their social networks. In concordance with our findings, previous reports have described mothers' feelings of alienation and unimportance, of being supervised, of having their personal needs and feelings suppressed and of efforts to conform to the existing norms of "good mothering" in order to cope with an authoritative structure at an NU (28-32). In addition, it has been sug-

gested that in the medical context, "the more the person matters to the subject" the "more intense the shaming experience" (109 p.1654-55). Thus, the mothers at an NU might be potentially at greater risk for experiencing intense shame than mothers of term and healthy infants, as their access to their infants and the mother-infant interactions are dependent on attitudes and behaviour of the staff. The experience of shame is important not only because it indicates a distrustful bond (110), but as it is a potent emotion produced by a negative self-evaluation (111). Even though shame is a normal part of social interaction, social control and social conformity (112), it is often verbalised and disguised through codewords such as: rejected, detached, powerless, or inadequate (113,114), expressions often used to describe the emotional experiences of mothers during care of their infants at an NU (26,32,43). It may be of considerable importance to regard these feelings as indications of shame, in order to understand its power and effects on the mother-infant relationship, as it is suggested that shame becomes disruptive when denied, unacknowledged or hidden (114) and may be self-degenerating, a cause of depression and a hindrance to the recognition of oneself as a mother, and of the infant (51,56,113,114). Interventions that empower parents as the primary care-givers (emotionally, socially and practically) may therefore be highly beneficial (115). More efforts should be made to change the staff's perception of themselves as doers, tutors and supervisors so that they become more of a resource available for parents on demand, which would facilitate the mothers' own exploration of mothering with some confidence (108,116).

Life on hold

We found that during the infant's hospital stay, the mothers used a strategy in which they "put life on hold". This was related not only to the previously described emotional chaos but also to the suppression of feelings and to the endurance in trying to perform as a mother during the greater part of the hospital stay, which has also been described by others (26,31,32). The effect of this emotional alienation may result not only in a state of emotional distance and withdrawal during the hospital stay, but also in 'unresolved grief' (117), unresolved feelings and social isolation, a long time after the discharge (48,108). Additionally, the fear of encountering negative remarks (43), or a feeling of shame for not being a 'happy mother' (118), can also be a barrier to social interactions with others. Enabling parents to ventilate their experiences during and after the hospital stay, with professionals or through parent-to-parent support groups, may be helpful both for mothers and for fathers in terms of reducing experiences of stress and depression (35,109,115,119).

Breastfeeding – duration and mother-infant relationship

In the results presented in this thesis, the rate of breastfeeding at 6 months was 69% in mothers of term infants, 62% in mothers of infants born at 32-36 gestational weeks and 45% in mothers of VPT infants. Compared to findings in other developed countries, our results for mothers of preterm infants show surprisingly high rates of breastfeeding (80). Furthermore, the lack of association of gestational age and neonatal disorders with breastfeeding duration is a highly positive finding, which is in contrast to most other reports (84,86,120). It was also found that mothers pendulated between regarding breastfeeding as being reciprocal to being non-reciprocal. These pendulations and their possible association with the duration of breastfeeding will be discussed in the following three sections.

The initial phase of breastfeeding

Early initiation of breastfeeding and skin-to-skin care were experienced by the mothers as 'conformational' and as a healing state, which strengthened the mother-infant relationship. In the early phase, breastfeeding was regarded as reciprocal, as it was experienced as mutually pleasurable, without any demands of 'succeeding' and as a fulfilment of the emotional needs of the infants and mothers. Such maternal emotions have not been described in high-risk populations previously. One reason for this might be the predominant focus on the techniques and support intended to facilitate the infant's initiation of breastfeeding and the mothers' provision of breast milk (121). Early encouragement and initiation may be positive, as they indicate that breastfeeding is possible, despite an early gestational age at birth (57) or a potential neonatal disorder, which may not be known in mothers who have given birth prematurely. In addition, an experience of early reciprocal breastfeeding enhances the mothers' feelings of competence and trust in their infants, which strengthen the 'emotional tie' between mother and infant (122,123). The early initiation might be one reason why it was found that neither gestational age nor neonatal disorders had an effect on the breastfeeding duration in mothers of very preterm infants. KMC (continuous skin-to-skin contact day and night throughout the stay, frequent and exclusive or nearly exclusive breastfeeding, and early discharge from hospital) is reported to be a successful way to empower mothers to become familiar with their infants and strengthen their own mothering at their own pace (36,37), and may promote reciprocal breastfeeding.

Breastfeeding at 'training camp'

Although some mothers perceived breastfeeding as reciprocal in the initial phase, breastfeeding was often felt to be a duty and a one-directional activity

later on during the NU stay. Some mothers described this as being at a "training camp", an experience related to the staff's behaviour and the enactment of some care routines. Some mothers in our study considered the care routines necessary, as they constituted a structure in the experienced chaos and means of providing the infants with breast milk and assessing the intake (68). But for most mothers the experience of having to disregard their infants' signals and needs and their own needs for closeness and interaction were highly negative aspects, implying a concept of non-reciprocal breastfeeding. In addition, the care routines and the staff's behaviour gave rise to situations in which the mothers felt success or failure, described for instance as: - "You have to get a result. There's no point in sitting there cuddling". These findings are in agreement with reports by from Dykes on mothers of term infants (70,72). In her study mothers described their experiences of breastfeeding as a labour, in which the nutritional considerations overshadowed more relational aspects. Dykes considers that with a professional discourse that disregards the relational interplay, breastfeeding will be perceived as a labour and a productive project. This might resemble what Goffman (124) describes as a 'total institution', as it presents the possibility of supervising the conduct and activities of each individual in order to assess, judge and evaluate the performance (125). Interestingly, the mothers in our study did not express a feeling of being in a public space with such emphasis initially as they did in relation to breastfeeding later at 'training camp'. This might indicate that the staffs were more relation-focused in the early phase and acknowledged the importance of bonding and attachment (105,108,126), whereas with time they became more task-oriented (29).

Breastfeeding the very preterm infant after discharge

In a pro-breastfeeding culture such as Sweden, mothers may not in general experience breastfeeding as something reciprocal or non-reciprocal, but as 'normal' with ups and downs. This was also true for mothers of VPT infants in the present study (IV), but the barriers to experiencing breastfeeding as reciprocal might have been more profound in these mothers than in mothers of term infants, for three major reasons. First, there was the mothers' feeling of being in an emotional state of exhaustion, which would hinder a reciprocal breastfeeding. Depression or a compromised emotional state has previously been found to be a barrier to breastfeeding and associated with feeding problems in mothers of VPT infants (67,127). Secondly, as breastfeeding at the NU was such an assumed and highly regulated activity, in which the immunological benefits of breast milk were emphasised, the infants' intake became of crucial concern as well as problematic, as the mothers did not know whether their infants were consuming enough milk by breastfeeding alone (88,89). A third barrier to an experience of reciprocal breastfeeding was a perceived lack of acknowledgement and responsiveness from the in-

fant. This latter has received attention in previous studies, in which difficulties in arousing the infant or the infant falling asleep during feeding are reported as barriers to breastfeeding (67). Thus, these experiences may be plausible reasons for the shorter breastfeeding duration in mothers of preterm infants compared to those of infants born at term.

The cultural norm and the maternal knowledge on the benefits of breast milk are two credible reasons for the longer breastfeeding duration found in the presented populations in comparison with others (78-80,128) and for the lack of association between neonatal disorders and breastfeeding duration. In addition, it is conceivable that it is more critical and important to accomplish breastfeeding as a symbol of motherhood and as a way of establishing dependency for mothers of VPT infants compared to term infants, in a pro-breastfeeding culture. Potential premises for this hypothesis are the perceived failure of giving birth at term and the experienced lack of importance to the infant during the NU or lack of infant's recognition and acknowledgement. As one mother stated: "the only thing that was left, where I could prove that I actually was a real mum, was to breastfeed".

Our findings showed that a long duration of breastfeeding was not synonymous with experiencing breastfeeding as reciprocal, a hypothesis supported by a study of mothers of term infants (71). Thus, it may be assumed that non-reciprocal breastfeeding occurs more frequently among mothers of VPT infants, since they reject their own emotions to a greater extent in trying to accomplish 'good mothering' according to the cultural norm and in wanting to give the very prematurely born infant "the best". Consequently, experiences of non-reciprocal breastfeeding in which emotions are rejected can have a negative impact on the mother-infant relationship (70).

SES and breastfeeding

We found that all of the studied socioeconomic factors, namely lower maternal education, maternal unemployment benefit, social welfare and lower equivalent disposable income in the household, were individually associated with weaning before 6 months in mothers both of term and preterm infants as well as in the subpopulation of mothers of VPT infants. These findings are supported in many studies, but previous studies have mostly been performed in settings with mixed attitudes towards breastfeeding and high income inequality (83,103,129). Thus, our observations on the effects of a low SES in a pro-breastfeeding culture become highly interesting. Prior discussions on the relation between SES and breastfeeding have mainly concerned the mothers' lack of knowledge on the beneficial effects of breast milk or the fact that lower education may impede lactation counselling (83), with conclusions focused on public health efforts to increase the knowledge and so-

cial acceptability in groups with a lower SES (82). This is probably relevant in less breastfeeding-positive settings. But in Sweden, the mechanisms underlying this relationship ought to be discussed from other aspects. In addition, as a low SES in Sweden, especially an adverse financial situation, is associated with various unfavourable outcomes related to health in infants (130), children (131-133) and parents (134), there is a need to discuss the effects of SES in more general terms.

It has been argued that it is not the richest countries that have the best health, but the countries with the smallest income differences (135), of which Sweden is one. Wilkinson (136) considers that in more egalitarian societies the association between health and SES is not primarily an effect of material standards, and states that the "importance of relative standards implies that psychosocial pathways may be particularly influential" (p.591). Lower social ranking, as indicated by a lower income, unemployment or lower education, entails a situation in which the person has less status and less control and power, which in turn produce stress and lower self-esteem (137). These theories lend support to previous findings on the relation between self-efficacy and breastfeeding (138), as low self-esteem or low self-efficacy implies a feeling of not being good enough or not having enough confidence in performing.

Our study showed that having received social welfare benefits was consistently adversely related to weaning, but that the effects of a low equivalent disposable income were somewhat divergent. Apart from the variable having received social welfare, the socioeconomic factor most strongly associated with weaning was a lower educational level. Wilkinson points out the importance of paying consideration to relative poverty, as a form of social exclusion (136), in which emotions such as insecurity and shame are produced (139). It could well be hypothesised that mothers with a low SES experience internal and external shame (140) to a higher degree than those with a high SES. The internal shame could be defined as a form of shame derived from the self's judgement of the self. This would be in line with the suggestion by Rubin (141) that it is the breach between the cognitive evaluation of the ideal self and that of the actual self that mediates a negative self-evaluation and self-esteem. The external shame is focused on the outside world and how one is judged by other people (140). Examples of the SES-shame-health association are presented in studies from Sweden, in which it was found that a higher degree of financial strain in combination with less secure bonds increases the risk for a high degree of shame (142). In addition, the greater the financial stress and the more shaming the experiences, the higher is the risk for anxiety, depression and reduced psychological well-being (143). The potentiality of external shame highlights the importance of the health care staffs, as they have a responsibility for providing an environment that, at the least, does not reduce feelings of self-esteem, produce shame, or neglect the

needs of those who are most vulnerable (109,144,145). Our finding that a lower SES is not more decisive for weaning from breastfeeding in mothers of preterm infants than in mothers of term infants is very promising. However, as a low SES is more prevalent among mothers of preterm infants (17,20), the population of mothers of preterm infants must in general be regarded as more susceptible.

Strengths and limitations of the studies

The main strengths of the qualitative studies are the enlightening descriptions of the mothers' experiences of breastfeeding and becoming a mother, during and after the discharge of the infant from an NU. In addition, as the approach used was inspired by grounded theory, the mothers were encouraged and enabled to talk about their main concerns. By this approach the presented findings show relevance and credibility (100). In this context it is important to discuss the interview environment and the role of the interviewer. To ensure the best possible interview situation, the mothers were allowed to decide where the interview should take place. Lincoln and Denzin (146) have expressed the view that the interviewer can influence the ability of the interviewee to speak authentically. The interviewee might censor her views and descriptions in order to conform to the 'appropriate' viewpoint. However, these mothers talked about experiences and feelings that were shameful and that in many cases had been repressed. The selection of mothers represented a broad variety of mothers and infants, but most of the mothers were middle-class women. However, although there was a plausible risk for "elite bias", as an attempt to include more mothers with a low SES failed, the dimensions in the mothers' stories were well represented. We reached the 'point of saturation' when we considered that no further interviews would yield more categories (or properties/dimensions) or improve the description of how the mothers experienced breastfeeding and becoming a mother. However, saturation is a 'misused' concept and dependent on the level of analysis. If the study had been conducted in consistence with grounded theory, with the aim of generating a theory with a high level of conceptualisation, the need to address the issue of saturation, as well as of drop-outs, would have been important.

The main strengths of the register-based studies lie in their coverage of the whole population in two counties and the provision of longitudinal breastfeeding data, gathered prospectively and with only a small number of missing data. As we used the predetermined definition of breastfeeding as proposed by the Swedish National Board of Health and Welfare (147), a definition which pays no regard to the method used for intake of breast milk, we do not know whether the mothers fed their infants directly from the breast or

bottle-fed them with mother's milk. A previous study in Sweden showed that breastfeeding predominantly consists of feeding from the breast, even in mothers whose infants need neonatal care and in those with a low-birth-weight infant (148), but the breastfeeding rates in VPT infants at 2 and possibly 4 months are probably to be considered as representing feeding with various methods. In addition, it would have been useful to have valid and reliable data on the frequencies of exclusive and partial breastfeeding, but as the definitions changed with time and between the two counties, these definitions had to be disregarded and replaced with 'breastfeeding' or 'not breastfeeding'.

In our definition of SES, we included maternal educational level, maternal unemployment benefit, social welfare and equivalent disposable income in the household, as it is suggested that a broad perspective reflects SES better than a single variable (96). Although a broad range of factors were available through Statistics Sweden, some additional aspects such as individual earnings, long-term income and occupation, were not elucidated or included, which would have been of value, as these variables may correspond better to position in the social structure (149,150). As Marmot has claimed that the more exact the classification system the stronger association between status position and health (137), our somewhat divergent findings on associations with equivalent disposable income and having received unemployment benefit might indicate that these measures were less valid markers of social position.

The data obtained from the MBR have in general previously shown good quality. However, regarding infant diagnosis, a previous evaluation showed an evident loss of data, especially for infants transferred to an NU (151). It is conceivable that the lack of association between neonatal disorders and breastfeeding duration might reflect a lack of statistical power. In addition, a loss of data or a lack of severity in the reported malformations and diagnosis might be plausible reasons for the lack of association. However, in our study minor malformations were excluded, leaving infants with malformations such as congenital heart malformation, trisomy 21 and malformed trachea. We could not use a more appropriate Apgar cut-off of < 4 points (152), and an SDS score of < -2 SDS in birth weight and birth length, because of the small number of infants with such scores. However, all the five infants with an Apgar score of < 4 were breastfed up to a postnatal age of 6 months, and three of 10 infants with a birth weight <-2 SDS.

Summary of results

Our findings indicate that the experiences of trustful/distrustful relationships, characterised by accompanying feelings of pride/trust and shame/distrust, were vital for the experiences in breastfeeding and becoming a mother, which were closely interwoven. The perceived quality of the relationships with the infant, father, staff, other mothers at the neonatal unit, and significant others, were affected not only by the interpersonal interactions but also by the contextual setting and the care routines. Described experiences of the emotional state, interpersonal interactions and the cultural context (i.e. hospital and society), during the NU stay and after the discharge, entailed pendular changes from regarding breastfeeding as being reciprocal to being non-reciprocal and from experiencing an insecure to a secure bond. Concerning breastfeeding, the mothers of very preterm infants struggled to experience reciprocity, defined as mutually satisfying breastfeeding which is enacted in concordance with the mother's own needs and the perceived needs of the infant. However, mothers often experienced breastfeeding as non-reciprocal, as a duty and a one-directional activity in which they disregarded their own emotions in trying to accomplish 'good mothering' in accordance with the cultural norm.

It was also found that a lower maternal educational level, receiving maternal unemployment benefit or social welfare, and a lower equivalent disposable income (SES), were all individually adversely associated with breastfeeding up to an infant postnatal age of six months. However, educational level and social welfare showed a stronger association and consistency with breastfeeding duration than income and unemployment benefit. Furthermore, a lower SES was not found to be more decisive for weaning in mothers of preterm infants than in those of term infants.

Findings also indicated that preterm infants were breastfed for a shorter time than term infants, even when adjustments were made for SES, smoking, cohabitation, maternal age, paternal education and county, but that gestational age at birth, size at birth and neonatal disorders were not associated with breastfeeding duration in very preterm infants.

Future research and clinical implications

The research presented in this thesis is of such a nature that it gives rise to more questions than answers. It should be emphasised that the presentation of the findings from the qualitative study should be seen as an attempt to make a vivid and relevant description of the emotions and experiences of mothers in the processes of breastfeeding and becoming a mother. Thus, more longitudinal, process-oriented and ethnographic research is needed in order to generate a theory with stringent conceptualisation regarding the process of breastfeeding. This is especially important for mothers of preterm infants and with a low socioeconomic status. In addition, there is an urgent need to perform randomised controlled studies so that the provision of care and the enactment of care routines are based on evidence.

Even though qualitative findings carry limitations regarding generality, our studies address relevant areas of concern in which substantial improvements need to be made. First, our results clearly show that the separation of mother and infant, and the disruption of the family, are strongly adverse factors. It is not satisfactory that parents and their infants spend the first months of the infants' life apart, and all efforts ought to be made to secure the parents' right to be with their infants. Secondly, as feelings of subordination and being replaceable were pronounced among mothers of VPT infants, a shift of power from the staff to the parents is necessary, from an empowerment perspective. A change of paradigm, in which the institutional forces are limited and the role of the staff is altered from 'doing' and supervising to become a resource and a facilitator, will empower parents to become self-sufficient. Thirdly, as breastfeeding is an intimate interaction, the professional discourse with focus on breast milk as nutrition and disregard for the relational interplay should be amended. Steps should be taken to increase the means of experiencing breastfeeding as a pleasure in which fulfilment of the mothers' needs has to be considered. Finally, the findings on the adverse effects of having a lower educational level, receiving unemployment benefit or social welfare, or having a low equivalent disposable income, call for allocations and prioritisations of resources to meet the needs of these more vulnerable mothers and infants. The health care staffs have a responsibility for providing an environment that, at the least, does not reduce feelings of self-esteem or neglect the needs of those who are most susceptible.

Sammanfattning (in Swedish)

Tidigare forskning om amning av underburna barn (<37 graviditetsveckor) har främst fokuserat på faktorer som har betydelse för att inte börja amma eller sluta amma efter en kort tid, som en enskild aktivitet och med begränsade studiepopulationer. Beskrivningar av hur mammor upplever amningen emotionellt under tiden på neonatalavdelning och efter utskrivning saknas.

Det övergripande syftet med denna avhandling var att öka kunskapen och förståelsen om hur amningen och mammablivandet påverkas och upplevs emotionellt hos mammor till underburna barn. Utifrån kvalitativ metod, inspirerad av Grounded Theory, intervjuades 25 mammor till mycket underburna barn som hade varit inskrivna vid 7 neonatalavdelningar i Sverige (I-II). Vidare genomfördes prospektiva populationsbaserade registerstudier av barn födda 1993-2001 i Örebro och Uppsala län (III-IV). Populationerna bestod av 35250 fullgångna barn, 2093 underburna barn (III), samt en subpopulation av 225 mycket underburna barn (IV). Data inhämtades från Barnhälsovårdens register på amning i dessa två län, Medicinska födelseregistret samt från Statistiska Centralbyrån.

Resultatet visade att det interpersonella samspelet mellan mamma och barn/pappa/personal/viktiga andra hade betydelse för mammans möjligheter att uppleva en ömsesidigt tillfredsställande amning och trygg mamma-barn relation, vilket påverkades av miljön (I). Upplevelserna av den institutionella vården, negligering av amning som relationellt samspel samt mammans emotionella utmattning, skapade hinder för en trygg och ömsesidig tillfredsställande amning och mamma-barn relation efter utskrivning (II). Mammor med låg socioekonomisk status hade en kortare amningstid i jämförelse med mammor med hög socioekonomisk status (III-IV). Oberoende av socioekonomisk status, så ammades underburna barn kortare tid (III) men grad av underburenhet och neonatal sjuklighet var inte relaterat till amningstidens längd hos mycket underburna barn (IV).

Sammanfattningsvis, upplevelsen av amning som kravfylld och ensidig, otrygg mamma-barn relation, samt betydelse av socioekonomisk status på amningstidens längd uppmärksammar nödvändigheten av förbättringar i miljön och stödet till familjer. En fördelning av resurser bör ske för att säkerställa behoven hos mer sårbara grupper.

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