



UPPSALA
UNIVERSITET

*Digital Comprehensive Summaries of Uppsala Dissertations
from the Faculty of Medicine 1468*

Breastfeeding – Initiation, duration, attitudes and experiences

KARIN CATO



ACTA
UNIVERSITATIS
UPSALIENSIS
UPPSALA
2018

ISSN 1651-6206
ISBN 978-91-513-0349-9
urn:nbn:se:uu:diva-348656

Dissertation presented at Uppsala University to be publicly examined in Gunnesalen, Akademiska sjukhuset ing 10, Sjukhusvägen 10, Uppsala, Thursday, 14 June 2018 at 09:15 for the degree of Doctor of Philosophy (Faculty of Medicine). The examination will be conducted in Swedish. Faculty examiner: Professor Eva Nissen (Karolinska Institutet).

Abstract

Cato, K. 2018. Breastfeeding – Initiation, duration, attitudes and experiences. *Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Medicine* 1468. 72 pp. Uppsala: Acta Universitatis Upsaliensis. ISBN 978-91-513-0349-9.

The overall aim of this thesis was to increase knowledge about factors that influence breastfeeding initiation and duration, as well as about women's attitudes towards breastfeeding during pregnancy.

The first two studies were a part of the UPPSAT project, a population-based cohort study conducted in Uppsala, Sweden. The women answered questionnaires five days, six weeks and six months postpartum, including questions on breastfeeding initiation and duration. Eight hundred and seventy-nine women and 679 women were included in the first study (Paper I) and second study (Paper II), respectively. The third study (Paper III) was part of the BASIC study, a large cohort following women from pregnancy and up to one year postpartum. In BASIC, the women completed web-questionnaires, and 1217 women participated during mid-pregnancy and postpartum. The fourth study (Paper IV) was part of a qualitative project, "Narratives of breastfeeding", and included 11 women, interviewed individually in late pregnancy.

The prevalence of the hands-on approach was 38%. Women who received the hands-on approach were more likely to report a negative experience of the first breastfeeding session (Paper I). Seventy-seven percent of the women reported exclusive breastfeeding up to, at least, two months postpartum. Being a first-time mother, reporting emotional distress during pregnancy, and giving birth by cesarean section were factors independently associated with exclusive breastfeeding lasting less than two months postpartum (Paper II). Women with depressive symptoms during pregnancy who breastfed for the first time later than two hours postpartum had the highest odds of not breastfeeding exclusively at six weeks postpartum (Paper III). When pregnant women thought about their future breastfeeding, they were balancing between social norms and personal desires (Paper IV).

These results can help to develop clinical practice to improve women's experience of the first breastfeeding session. Additionally, the results may facilitate identifying women in need for targeted support, in order to promote longer exclusive breastfeeding duration. By acknowledging pregnant women's thoughts and attitudes about breastfeeding, breastfeeding information and support, health care professionals can meet the needs and desires of women.

Keywords: Breastfeeding, Breastfeeding duration, Breastfeeding initiation, Depression, Hands-on approach, Pregnancy

Karin Cato, Department of Women's and Children's Health, Akademiska sjukhuset, Uppsala University, SE-75185 Uppsala, Sweden.

© Karin Cato 2018

ISSN 1651-6206

ISBN 978-91-513-0349-9

urn:nbn:se:uu:diva-348656 (<http://urn.kb.se/resolve?urn=urn:nbn:se:uu:diva-348656>)

To Albin, Love and Nora

List of Papers

This thesis is based on the following papers, which are referred to in the text by their Roman numerals.

- I Cato, K., Sylvén, S.M., Skalkidou, A., Rubertsson, C. (2014) Experience of the first breastfeeding session in association with the use of the hands-on approach by healthcare professionals: A population based study. *Breastfeeding Medicine*, 9(6):294–300
- II Cato, K., Sylvén, S.M., Lindbäck, J., Skalkidou, A., Rubertsson, C. (2017) Risk factors for exclusive breastfeeding lasting less than two months – Identifying women in need of targeted breastfeeding support. *PLoS ONE* 12(6):e0179402
- III Cato, K., Sylvén, S.M., Georgakis, M.K., Kollia, N., Rubertsson, C., Skalkidou, A. Antenatal depressive symptoms and early initiation of breastfeeding in association with exclusive breastfeeding 6 weeks postpartum: A longitudinal population-based study. *Submitted*
- IV Cato, K., Sylvén, S.M., Wahlström Henriksson, H., Rubertsson, C. Breastfeeding as a balancing act – pregnant Swedish women’s voices on breastfeeding. *Submitted*

Reprints were made with permission from the respective publishers.

Cover: Graphite drawing by Kersti Cato

Contents

Introduction.....	9
Significance of breastfeeding.....	9
Recommendations on breastfeeding.....	10
Factors that influence breastfeeding.....	10
Socioeconomic factors.....	11
Breastfeeding initiation.....	12
Health care routines.....	13
Health care professionals and the hands-on approach.....	14
Social support.....	16
Psychological factors and depression.....	17
Theoretical framework.....	18
Rationale.....	20
Aim.....	21
Overall aim.....	21
Specific aims.....	21
Paper I.....	21
Paper II.....	21
Paper III.....	21
Paper IV.....	21
Materials and methods.....	22
Study population and design – Papers I & II.....	23
Study variables and outcome measures – Paper I.....	23
Data analysis – Paper I.....	24
Study variables and outcome measures – Paper II.....	24
Data analysis – Paper II.....	25
Study population and design – Paper III.....	25
Study variables and outcome measures – Paper III.....	26
Data analysis – Paper III.....	27
Study population and design – Paper IV.....	27
Data collection – Paper IV.....	28
Data analysis – Paper IV.....	28
Ethical Considerations.....	29

Results.....	31
General results Papers I & II.....	31
Paper I.....	33
Characteristics.....	33
Findings.....	33
Paper II.....	34
Characteristics.....	34
Findings.....	35
Paper III.....	37
Characteristics.....	38
Findings.....	39
Paper IV.....	41
Characteristics.....	41
Findings.....	41
Discussion.....	44
The hands-on approach.....	44
Risk factors for exclusive breastfeeding lasting less than two months....	46
Depressive symptoms and breastfeeding initiation as variables that influence breastfeeding duration.....	47
Women's voices on breastfeeding, as formulated during pregnancy.....	49
Theoretical reflections.....	51
Methodological considerations.....	53
Conclusion and clinical implications.....	57
Future studies.....	58
Sammanfattning på svenska – Summary in Swedish.....	59
Acknowledgements.....	62
References.....	64

Introduction

When searching the Internet for a definition of breastfeeding, it is presented on various homepages, described as a “method of feeding the baby milk directly from the mother’s breast”. Although correct, this definition lacks the perspective of a behavioral act and the relationship between the mother and her infant that, for as long as we have known, has nourished and protected newborns.

The vast majority of mothers in Sweden initiate breastfeeding. In 2015, 95% of the mothers breastfed at one week postpartum (1). Nevertheless, breastfeeding rates are decreasing. The Swedish National Board of Health and Welfare provides annual statistics of breastfeeding at one week, two months, four months, six months and one year after birth, both for exclusive breastfeeding (since 1964) and any breastfeeding (since the 1980s). The statistics are based on information collected in primary care, and exclusive breastfeeding refers to giving the infant only breastmilk and, if needed, medicines and vitamins (2). During the late 1990s until approximately 2004, 83% of all infants in Sweden were breastfed at four months and 72% at six months. In 2015, these figures had decreased to 74% at four months and 63% at six months (1). Breastfeeding affects public health in general, but also affects health on an individual level. Breastfeeding and motherhood is often pictured as inseparable by new mothers, and not being able to breastfeed as intended may lead to a crisis reaction (3). There are many factors that influence breastfeeding and breastfeeding behavior, such as demographic, social, physical and psychological factors (4). Health care practices can also present barriers to breastfeeding. By investigating and acknowledging factors, that might possibly influence breastfeeding, professional breastfeeding support can be improved and, hence, health care services can better meet the needs of women.

Significance of breastfeeding

Breastfeeding provides infants with optimal nutrition and plays an important part in developing their immune system. Breastfeeding is associated with a reduction in risk of infections, a reduction in risk of sudden infant death syndrome and necrotizing enterocolitis, and has several long-term health benefits for the child, for example, a reduction in the risk of developing diabetes type II and obesity (5-8). Breastfeeding also protects against childhood acute otitis

media, with greater protection provided with longer breastfeeding duration and exclusivity (9). In a recent meta-analysis, published as part of a series by *The Lancet* in 2016, the authors reviewed studies examining the short-term and long-term health effects of breastfeeding, irrespective of country, i.e., low-income country or high-income country. Evidence-based findings presented in *The Lancet* series declares that breastfed children experience lower infectious morbidity and mortality, fewer dental malocclusions (irregular bite, cross bite or overbite) and achieve a higher intelligence quotient on intelligence tests. The meta-analysis also indicates that there is growing evidence that breastfeeding might protect against overweight and diabetes later in life (10). In addition, breastfeeding provides health benefits for the mother, such as a reduction of risk for breast and ovarian cancer, as well as a reduction in the prevalence of diabetes type II, hypertension, and cardiovascular diseases (11, 12). Furthermore, breastfeeding mothers more seldom experience depressive symptoms than mothers who do not breastfeed (13).

Recommendations on breastfeeding

The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommend skin-to-skin contact between mother and newborn directly after birth, and breastfeeding initiation within one hour, followed by exclusive breastfeeding for six months and thereafter the introduction of solid foods in combination with continued breastfeeding for up to two years or longer (14).

In Sweden, the recommendations on breastfeeding are similar, although they include an amendment declaring that the introduction of "tiny sensations" of solid food from the age of four months is harmless if it does not affect continuous breastfeeding for up to one year or longer (15). These recommendations are distributed to families in Sweden, not only through the National Food Agency, but also by the health care service, for example, during prenatal classes or at children's health care centers.

Factors that influence breastfeeding

There are many factors that influence breastfeeding and breastfeeding behavior. Some factors that are potentially associated with breastfeeding include socioeconomic variables, health care routines and practices, social support, and psychological factors.

During the 20th century, as pregnancy and birth became medicalized, attitudes towards breastfeeding were affected. Not long ago, it was believed that newborns should be disciplined, starting from birth. To accomplish this, the feedings became regulated to occur every three to four hours, and the babies

were separated from their mothers in between (16). Today, this idea of scheduled and regulated breastfeeding has been rejected, and rooming-in is practiced in Sweden. Nevertheless, health care systems as well as society in general still present barriers to breastfeeding. To promote and protect breastfeeding, the WHO and UNICEF have taken action, for example, by launching The International Code of Marketing of Breastmilk Substitutes in 1981, thus regulating the promotion of manufactured breast milk substitutes (17). The Innocenti Declaration (18), launched in 1990, emphasized that actions were needed to ensure the best start for newborns and their mothers, followed by the Baby-Friendly Hospital Initiative in 1991, based on the “Ten steps to successful breastfeeding”, a summary of necessary practices to support breastfeeding, and hence a practical action plan for health care professionals in facilitating breastfeeding (19). In short, the “Ten steps to successful breastfeeding” includes the recommendation that all facilities that provide maternal services and care for infants should have a written and implemented breastfeeding policy and must inform women and their families about the benefits and management of breastfeeding. Further, to help mothers initiate breastfeeding and show them how to maintain lactation, women should be instructed to give no other food or liquids (if not medically indicated), practice rooming-in, encourage breastfeeding on demand, and foster the establishment of breastfeeding support groups. When the “Ten steps to successful breastfeeding” are followed, breastfeeding duration is prolonged (20). As part of the campaign by UNICEF, the Baby-Friendly Hospital Initiative was introduced in Sweden in 1993. By 1997, all maternity centers in Sweden were approved as being baby-friendly, working according to the Ten steps in a positive breastfeeding climate, and thereby increasing breastfeeding rates (21). Since then, the Baby-Friendly Hospital Initiative in Sweden has faded, and breastfeeding rates have decreased.

Socioeconomic factors

Sociodemographic and socio-economic factors influence breastfeeding (22). The duration of breastfeeding is often dependent on the working situation of the individual woman and, in most countries worldwide, the statutory parental leave provision is short or non-existent (23), leaving the mother to choose the method of feeding the baby according to the parental leave possibilities and her job (24). In Sweden, the parental leave system grants parents 480 days in total per child. Hence, Swedish women, in general, do not need to face this issue, at least not during the first six months. Notably, most parental leave days are spent during the first two years and, in total, the days are mostly used by the mothers (76.3%) (25). Consequently, issues other than work-related ones ought to influence Swedish women when it comes to planning their future breastfeeding, as well as their choice of breastfeeding; exclusively, partially, or not at all. However, infants are less likely to be breastfed when the

mother's partner does not use parental leave days during the infant's first year (26).

Being a single mother with a lower socioeconomic status is associated with poorer breastfeeding outcomes (27). Mothers who smoke before, during and/or after pregnancy breastfeed less than non-smokers, and lower maternal education level affects breastfeeding negatively (28). Women with a lower level of education more often report smoking as well as having a tendency towards being overweight and obese. The prevalence of overweight and obesity increases each year in Sweden, and, in 2016, 44% of Swedish women were reportedly overweight or obese. Among women entering prenatal services in 2016, 41% were reported to be overweight or obese (29). Overweight and obese women less often initiate breastfeeding and discontinue breastfeeding earlier than women who are of normal weight (30). With increasing incidence of overweight/obesity, decreasing rates of breastfeeding have been noted (31). This association between obesity and a shorter breastfeeding duration is probably due to a delay of the second stage of lactogenesis (32) and a lower prolactin response to suckling (33). Furthermore, it has been suggested that a lack of body comfort or confidence, more often found in overweight/obese women, might play an important role as a mediator between overweight/obesity and breastfeeding duration (34, 35).

Breastfeeding initiation

The best way to welcome a newborn into the world is by letting the baby come directly upon the mother's chest, in close skin-to-skin contact. Skin-to-skin care between mother and newborn has several benefits, facilitating the newborn's adaptation and the initiation of breastfeeding. Skin-to-skin care is ideal for the newborn baby to self-regulate the body temperature (36, 37) and keep blood glucose levels stable (37, 38). Newborns who have been cared for with skin-to-skin contact more seldom cry (37) and experience less pain (38), and skin-to-skin care may increase the mother's sensitivity to the mother-infant interaction (39). Previous research has come to the conclusion that the skin-to-skin contact between mother and newborn should be uninterrupted during the first hours after birth until the first breastfeeding session has been accomplished. Furthermore, caregiving routines should be designed to enable uninterrupted skin-to-skin care between mother and newborn, as interruptions, such as measuring, weighing and dressing the newborn, increase the length of time between being born and latching on and potentially hinder the newborn from finding the sufficient suckling technique (40). Among mothers who give birth by cesarean section, early skin-to-skin contact in the operative theater enhances the possibility of a longer duration of breastfeeding (41), although cesarean section is associated with poorer breastfeeding outcomes (42).

Skin-to-skin contact also reduces the risk of supplementation use (43) and is instead associated with earlier initiation of breastfeeding among term infants

(40) as well as earlier attainment of exclusive breastfeeding among preterm infants (44).

When placed skin-to-skin immediately after birth, the newborn approaches the breast and starts suckling due to its inborn biological behavior (45), although this behavior can be suppressed under the mother's exposure to analgesia (46). Further investigations of this biological behavior have been thoroughly described by Widström et al. (47) as an innate behavior consisting of nine distinct phases, commencing with the *birth cry* and ending after latch-on and *suckling* before the final phase; *sleeping*. In between these phases, the newborn rests without any movements (*relaxation*), begins to show small signs of activity (*awakening*), starts to show determined movements and rooting activity (*activity*), shows shifting movements of his/her body (*crawling*), resting, although showing some minor activity such as sucking on his/her hands (*resting*), and, finally, reaching the nipple with his/her mouth (*familiarization*). Through massage-like hand movements, the newborn prepares the nipple for breastfeeding and, simultaneously, maternal oxytocin-levels rise, which may be important for the milk ejection reflex (48). In addition, Colson et al. (49) observed that the primitive neonatal reflexes that stimulate breastfeeding and the breast crawl occur more often when the breastfeeding session takes place in a reclining position, where both the newborn and the mother's innate reflexes are released and this facilitates latch-on and breastfeeding.

The first breastfeeding session, when commencing early, i.e., within the first hours after birth, has been shown to have a positive impact on maternal-infant attachment and breastfeeding duration (39, 50-52). Breastfeeding within the first hours after birth triggers the milk production (53) as the maternal levels of oxytocin increases when the newborn massages the mother's breast (48), and oxytocin stimulates prolactin secretion (54). Breastfeeding self-efficacy may rise with early breastfeeding initiation, while delayed breastfeeding initiation decreases maternal breastfeeding self-efficacy (55). Nevertheless, initiating breastfeeding within the first hours after birth or avoidance of separation is not always practiced in clinic.

Health care routines

Because nearly all women in Sweden attend maternity services during pregnancy, give birth to their baby in the presence of health care professionals, and later visit the child health care center for regular check-ups, the women and their partners encounter several different types of health care staff of varying professions during their transition to becoming parents and as they navigate parenthood. From pregnancy onwards, parents are given information by health care professionals on various topics, for example, which food to avoid while pregnant, the types of pain relief available during labor, and breastfeeding in-

formation. Nevertheless, when interviewed, Swedish women express difficulties in obtaining individualized information and individualized breastfeeding support (56).

This situation, where parents meet several different personnel of varying professions during the perinatal care period, is not unique for the Swedish health care system. Studies from other countries show that women describe breastfeeding information and support as being contradictory and inconsistent, probably due to a combination of time pressure and a lack of knowledge among health care professionals (57, 58).

The length of hospital stay postpartum has decreased over the years in Sweden. In 1973, women who gave birth vaginally stayed in hospital for six days, while in 2014, this figure has decreased to less than two days (29). Nevertheless, studies have shown that the length of hospital stay postpartum does not seem to influence breastfeeding negatively (59, 60). Some Swedish counties offer domiciliary support by a midwife after early hospital discharge. As an example, in Uppsala, all mothers receive at least one phone call, but often also a home visit, from a midwife during the first days postpartum after leaving the hospital within 72 hours postpartum. Structural observations of the breastfeeding sessions, documented in the women's and newborns' medical records, respectively, help to assess whether further breastfeeding support is needed (61, 62).

Hospital care routines strongly influence breastfeeding initiation (50). In some scenarios, children born by cesarean section are to be removed from the operating theater, and from the mother, shortly after birth, for measurement and assessment. If a midwife or a nurse is not available to take responsibility for the newborn in the recovery ward, the baby will be separated from the mother and instead will be cared for by the woman's partner in the maternity ward. During the evening and at night, it is common that the mother is separated from her baby for several hours. This management strategy, which includes separation, might not only include women who undergo cesarean section, but also women who experience, for example, larger vaginal tears or retained placenta. If the partner cares for the baby skin-to-skin, this will lead to more vocal communication between partner and baby and closer interaction between partner and mother (63). Hence, if separation between mother and baby cannot be averted, the baby should be cared for by the partner, skin-to-skin.

Moreover, formula supplementation during the hospital stay decreases the chances of a longer exclusive breastfeeding duration (64), especially when given without medical reasons (51).

Health care professionals and the hands-on approach

When health care professionals force the baby to the breast, using their hands and touching the woman's breast and the baby in order to stimulate latch-on

and breastfeeding, this is referred to as using the hands-on approach. As a result of regulated breastfeeding during the 20th century, different techniques had to be used to make newborns latch on and breastfeed, and the hands-on approach was such a technique (65). The use of the hands-on approach has been questioned. Weimers et al. (66) carried out in-depth interviews with ten Swedish mothers who had given birth to babies, who at the time were admitted to the Neonatal Intensive Care Unit, and who had experienced non-consensual hands-on breastfeeding support. The researchers identified five main themes, labelled as; Insult to integrity, Manipulating the baby, Understanding and adjustment, Breasts as objects, and, finally, Alternative to this practice. The mothers described the experience of gaining breastfeeding support with the hands-on approach by health care professionals as a violation of their integrity. Furthermore, the hands-on approach brought feelings of being exposed and was experienced as forced breastfeeding. The participants expressed uncertainty with the purpose of the hands-on approach, feelings of loss of control over their breasts as part of their body, and expressed a need for a different kind of breastfeeding support. This kind of breastfeeding support could, for example, take the form of health care professionals using dolls and breasts made of fabric, thus showing positions and techniques while sitting down and taking time to demonstrate and provide information. Because the hands-on approach has been described as disrespectful, distressing and physically intrusive (3, 58), the approach probably should be avoided by health care professionals when providing breastfeeding support. Conversely, studies exploring other alternatives to breastfeeding support than the hands-on approach, with a focus of teaching midwives to teach women to position by themselves, show decreased numbers of problems related to breastfeeding and increased length of breastfeeding duration (67). An early discontinuation of breastfeeding often relates to breastfeeding problems (68).

Approaches to breastfeeding support may vary between health care professionals. A systematic review by Swerts et al. (69) including twelve articles on the perspective of midwives and their ability to provide breastfeeding support, identified two perspectives of midwives as health care professionals. First, *the technical expert*, being breast-centered, focusing on techniques, and seeing the woman as a novice, uses the hands-on approach in order to teach the woman how to position and attach the baby to the breast as an expert, hence supervising the woman. The second perspective, namely, *the skilled companion*, is adopted by a health care professional who is woman-centered, offering individual breastfeeding support, and who mainly uses a hands-off approach while providing breastfeeding support. Although midwives in general wanted to be the skilled companion, they perceived barriers to this, such as time pressures due to their workload. Equally, a barrier to hands-off breastfeeding support is that it is seen as time-consuming, hence it is perceived as being easier to attach the baby to the breast rather than taking the time to practice a hands-off approach (70). In Swedish studies, Ekström et al. (71) identified four factors of

attitudes among health care professionals, namely; regulating, facilitating, disempowering, and breastfeeding antipathy factors, but they also showed that the attitudes of the health care professionals could improve by implementing process-oriented breastfeeding training (72).

By using the hands-on approach to accomplish breastfeeding, the health care professionals discourage the woman from managing breastfeeding on her own, sometimes making the woman dependent on the staff to attend at every breastfeeding session and thus making her feel insecure about her own ability (66). Combined with the busy environment at the hospitals, this practice could probably lead to lower breastfeeding self-efficacy among women (73), which in turn is likely to reduce breastfeeding duration (74). Influenced by breastfeeding experiences, the perception of breastfeeding self-efficacy is changeable over time (75) and increases with breastfeeding duration (76). Women perceive breastfeeding support as good if the support responds to the woman's individual needs (77).

Social support

Attitudes to breastfeeding among family and friends influence the breastfeeding behavior of the individual woman. Having a supportive partner is one of the factors that increases a mother's self-confidence and correlates with successful breastfeeding (78, 79). First-time mothers breastfeed for a shorter time than women with previous breastfeeding experience (80). A first-time mother's sense of security is strengthened if her partner is allowed to be closely involved and is welcomed to stay in the maternity ward. It also helps the couple in the transition into family-hood (81). Notably, many Swedish maternity wards offer the partner the opportunity to stay with the mother and baby, both day and night, however, the scarcity of rooms may sometimes not allow for the partner to stay. According to breastfeeding mothers, it is important that the partner receives the same information regarding breastfeeding as the mothers do, a strategy which also is perceived by partners to be helpful (82).

The mother of the pregnant woman or new mother is also an important source of breastfeeding information and support, if she herself has had positive experiences of breastfeeding (78). On the other hand, when the grandmother has had negative experiences of breastfeeding or has negative attitudes towards breastfeeding, this is more likely to influence the breastfeeding of their daughter negatively (83).

Breastfeeding in public spaces is an issue often debated in the Swedish media in the 21st century. Women have experienced negative comments towards breastfeeding in public, and are sometimes told to cover themselves while breastfeeding. Breastfeeding in public has been described as a barrier to breastfeeding as it is not always viewed as being acceptable (84, 85) and this influences breastfeeding duration (86). A study that investigated whether

women's intentions to breastfeed were related to their comfort with breastfeeding in public settings reported that women who feel uncomfortable breastfeeding in social settings more often had the intention to not breastfeed exclusively (87). Nevertheless, studies have concluded that support for breastfeeding in public and improved breastfeeding attitudes can be altered by distributing more pro-breastfeeding messages through the media (88). However, the media often highlight barriers to breastfeeding rather than the factors that facilitate it (89).

Psychological factors and depression

Sociodemographic and socioeconomic factors have been reported to affect breastfeeding behavior, but studies also indicate that psychological factors, such as breastfeeding self-efficacy, are even more predictive of breastfeeding (90). Women with higher breastfeeding self-efficacy breastfeed longer and more exclusively and cope more positively with eventual breastfeeding complications (74). As mentioned before, the busy unfamiliar hospital environment can lower mothers' breastfeeding self-efficacy, while at the same time, midwives' self-efficacy as providers of adequate breastfeeding support can decrease with their increased workload (73). Breastfeeding self-efficacy also has an impact on perceived insufficient milk supply (91), showing the importance of instilling confidence in breastfeeding. It is common that women in Western settings perceive that they have an insufficient milk supply and therefore discontinue breastfeeding (92, 93). Furthermore, high levels of breastfeeding self-efficacy in the early days postpartum predict that the mother is less likely to have depressive symptoms later on (94).

Depression is one of the most common complications both during pregnancy and postpartum, and has a great impact, not only on the affected person, but also on their family members and on society. In a population-based sample of 1555 Swedish women, Andersson et al. (95) found 29% of the pregnant women and 16.5% of postpartal women to be depressed and/or experiencing anxiety. Apart from personal suffering, depression during pregnancy increases the risk of adverse neonatal outcomes such as preterm birth and low birth weight (96, 97). It has also been suggested that postpartum depression might adversely affect the child's cognitive and socioemotional development (98). Regarding depressive symptoms and their possible association with breastfeeding, the results from previous studies are inconsistent. Studies have found that depressive symptoms during pregnancy do not predict breastfeeding initiation, which is an important factor for breastfeeding duration (99). On the other hand, a meta-analysis of the impact of maternal depression during pregnancy on perinatal outcomes found intention to breastfeed to be negatively affected by depressive symptoms during pregnancy (100). Furthermore, depressive symptoms are associated with poorer breastfeeding outcomes and

breastfeeding is suggested to be a protective factor against depressive symptoms (13, 101). However, a recent population-based prospective study from Norway, including 1757 women, found no evidence of a relationship between depressive symptoms and breastfeeding outcomes (102). In the Norwegian study, some important limitations must be considered, namely, that the participants were recruited from clinics using the Edinburgh method (combining the Edinburgh Postnatal Depression Scale and a conversation with health personnel), which might be the reason why the levels of depressive symptoms were rather low among the participants. Furthermore, the authors assumed that most participants had a strong intention to breastfeed, which could be more important for breastfeeding duration than depressive symptoms (99).

Some labor routines might affect emotional well-being and mood. For example, administering synthetic oxytocin during labor increases the risk of mood disorders, both in women with a history of depression or anxiety and in women with no such history, regardless of the mode of birth (103). The use of epidural local anesthetics often includes the administration of synthetic oxytocin. Jonas et al. (54) found that the combination of epidural and synthetic oxytocin decreases the levels of naturally occurring oxytocin. Lower levels of naturally occurring oxytocin increase the risk of depression and anxiety (104). Furthermore, synthetic oxytocin administered intrapartum may inhibit neonatal reflexes associated with breastfeeding (105). On the other hand, both breastfeeding and skin-to-skin contact relates to lower levels of stress (106).

Many women who are affected by depression are advised by health care professionals to discontinue breastfeeding, at least during nighttime, in order to gain more rest. Nevertheless, breastfeeding mothers who are bed sharing get more sleep than mothers who provide formula by bottle-feeding (107). By practicing exclusive breastfeeding, according to some studies, women get 40 minutes more sleep than women who formula feed (108). Furthermore, according to Blyton et al. (109), women who breastfeed have better sleep quality.

Theoretical framework

The social ecological model of health (110) is the theory-based framework underpinning this thesis. The model provides a comprehensive approach in understanding the factors that influence breastfeeding. According to this model, the micro-level behaviors and health outcomes of an individual are not independent from the external macro-level factors, hence the factors that influence breastfeeding are the result of interactions between multiple factors, such as individual factors as well as societal factors. The social ecological model of health consists of five levels, namely, individual level, interpersonal level, community level, organizational level, and policy level. Accordingly, this model takes into consideration the multi-factorial connections of biologic,

behavioral and environmental influences and the social and familial relationships that might have an impact on the individual. The social ecologic model of health helps to improve our understanding of the factors that influence breastfeeding and breastfeeding duration and acknowledges that, to better meet the needs of women who intend to breastfeed, health care professionals should consider each woman's individual need.

Self-efficacy theory, which originated from social learning theory as explained by Bandura (111), also permeates throughout the thesis. Self-efficacy refers to one's belief that a given behavior will lead to a given outcome and the perceived ability and confidence to perform the activity leading to the outcome. Breastfeeding self-efficacy, as suggested by Dennis (112), relies on past breastfeeding experiences, observational learning, verbal encouragement and the physiological or emotional state of the woman. Enabling the empowerment of women during the perinatal period might influence her breastfeeding self-efficacy. In previous studies, higher breastfeeding self-efficacy has been associated with both early initiation and a longer duration of breastfeeding as well as coping with eventual breastfeeding problems (74). Skin-to-skin contact and an early breastfeeding initiation leads to improved breastfeeding self-efficacy (113). Also, educational programs based upon the self-efficacy theory positively increase women's confidence in their ability to breastfeed (114).

Rationale

Many factors influence breastfeeding and breastfeeding duration. Studies indicate that the hands-on approach is described to be disrespectful, distressing and harmful. Other studies highlight that the first breastfeeding session may be crucial for continuous breastfeeding. There is, to our knowledge, no study investigating the prevalence of the hands-on approach during the first breastfeeding session with a quantitative method, or its possible associations with the mothers' experience of the first breastfeeding session. Such information could be valuable to promote an attitude-change among health care professionals.

Investigating breastfeeding duration, and possibly identifying an at-risk population, is important. Breastfeeding duration has been explored in many studies, although not in this setting. Increasing the knowledge on breastfeeding duration may lead to revisions of routines and guidelines, in order to offer women the best evidence-based breastfeeding support. Because the Swedish National Food Agency states that parents can start to offer their babies minor parts of solid food from four months of age (15), it is essential to investigate exclusive breastfeeding duration before that time, when there is no obvious reason for introducing other food or drinks.

Depressive symptoms during pregnancy are, unfortunately, common. Experiencing depressive symptoms might lead to a shorter breastfeeding duration. Breastfeeding should, preferably, be initiated during the first hours postpartum. The association between depressive symptoms during pregnancy and early initiation of breastfeeding is poorly investigated. By investigating this question, we can find factors contributing to how to strengthen women who experience depressive symptoms during pregnancy in their breastfeeding goals.

Breastfeeding intention is associated with breastfeeding exclusivity and duration. Most women in Sweden intend to breastfeed according to recommendations. Nevertheless, breastfeeding rates in Sweden are declining, especially during the first months postpartum. Attitudes about breastfeeding and desired breastfeeding support, as expressed by pregnant women, are important to explore in order to gain a deeper understanding of women's needs.

Aim

Overall aim

The overall aim of this thesis was to increase knowledge about factors that influence breastfeeding initiation and duration, as well as about women's attitudes towards breastfeeding during pregnancy.

Specific aims

Paper I

To investigate the prevalence of health care professionals' use of the hands-on approach during the first breastfeeding session postpartum, and its correlates as well as its possible association with the mothers' experience of their first breastfeeding session.

Paper II

To investigate factors possibly associated with exclusive breastfeeding lasting less than two months.

Paper III

To assess the interplay between depressive symptoms among pregnant women and time of initiation of breastfeeding after birth on exclusive breastfeeding at six weeks postpartum.

Paper IV

To explore Swedish women's attitudes towards breastfeeding, as formulated during pregnancy.

Materials and methods

This thesis includes both quantitative and qualitative study designs. The studies reported in Papers I–III are of quantitative designs, undertaken as part of two larger, epidemiological, population-based studies, to be presented more thoroughly under the headings “Study population Papers I & II” and “Study population Paper III”. In Papers I–III, the prevalence of the hands-on approach during the first breastfeeding session, the experience of the first breastfeeding session, and breastfeeding duration were investigated. The fourth study (Paper IV) was of qualitative design and was based on semi-structured individual interviews, held face-to-face or by telephone, depending on the informants’ choice. The study was conducted to explore pregnant women’s attitudes towards breastfeeding. *Table 1* shows an overview of the research studies as reported in the papers included in this thesis.

Table 1. *Overview of the methods used in this thesis*

Paper	Design	Participants	Data collection	Data analysis
I	Cross-sectional study	879 women	Questionnaire at 5 days, 6 weeks and 6 months postpartum	Descriptive statistics and multivariate logistic regression
II	Nested case-control study	679 women	Questionnaire at 5 days, 6 weeks and 6 months postpartum	Descriptive statistics and multivariate logistic regression
III	Nested case-control study	1217 women	Web-based questionnaire in pregnancy weeks 17–20 and 6 weeks and 6 months postpartum	Descriptive statistics and multivariate logistic regression
IV	Qualitative interview study	11 women	Individual interviews were held in late pregnancy	Thematic analysis

Study population and design – Papers I & II

The studies reported in Papers I and II were undertaken as part of the UPPSAT (Uppsala-Athens Project in Postnatal Depression) study, a population-based cohort study conducted in the county of Uppsala, Sweden, investigating correlates of postnatal depression between May 2006, and June 2007. UPPSAT was conducted at the Department of Obstetrics and Gynecology at the Uppsala University Hospital, Uppsala, Sweden, which is the only hospital providing birth services in the county. Uppsala is a medium-sized Swedish county with a population of 367,483 inhabitants and the annual birth rate is approximately 4000.

All eligible women who gave birth at the Uppsala University Hospital were asked, within some hours after birth, by their midwife or midwife's assistant about their willingness to participate. Eligible women were those who were able to read and write in Swedish, women with no confidentially kept personal data, and women who had given birth to live, healthy infants who were not immediately admitted to the neonatal intensive care unit after birth.

Five days postpartum, the mothers completed the first questionnaire containing sociodemographic data; medical and obstetric history, education, age, marital status, weight and height.

Six weeks after birth, a second questionnaire was sent to the women, containing, *inter alia*, the Stressful Life Event scale by Rosengren et al. (115). The participants also assessed the scale at six months postpartum, as it was included in the third questionnaire of UPPSAT.

In addition to the third questionnaire, which was sent to the women six months postpartum, a subsample of women received a complementary breastfeeding questionnaire. This contained questions on breastfeeding initiation and duration, caregivers' support during the first breastfeed, and experience of the first breastfeeding session. This additional questionnaire was sent out over a period of ten months, in contrast to the third questionnaire in the whole of the UPPSAT study, which was sent throughout the whole study period.

Information on gestational week at birth, vaginal tears, mode of giving birth, the baby's weight and the use of anesthetics was gathered from the medical records. No reminders were sent due to administrative reasons.

Study variables and outcome measures – Paper I

Information on age, body mass index, family status, educational level, smoking during pregnancy, previous psychiatric contact and experience of giving birth was included in the first questionnaire. Experience of giving birth (rated as excellent, good, ok, bad or awful) was dichotomized as a positive (excellent, good or ok) or negative (bad or awful) experience of giving birth.

The second questionnaire, distributed to the women at six weeks postpartum, provided us with data on stressful life events, through a 10-item scale. The variable was dichotomized into no or one stressful life event versus two or more stressful life events during the past year. The scale was also included in the third questionnaire, dichotomized into no or one stressful life event versus two or more stressful life events during the past six months.

Furthermore, included in the third questionnaire was the extensive breastfeeding questionnaire. It included 12 questions and 30 statements with yes/no alternative answers. The statements were phrased such as “The first breastfeeding session was a positive experience to me” and “At the first breastfeeding session, the caregivers helped me breastfeeding by using their hands, attaching my breast to the baby’s mouth” (i.e. hands-on). Information on place/setting during the first breastfeeding session (delivery ward versus maternity ward or elsewhere, in which the former consequently indicates postponed first breastfeeding session with at least two hours), successful breastfeeding during hospital stay, or formula supplementation during hospital stay, was also included in the breastfeeding questionnaire as statements with yes/no alternative answers.

The mothers’ subjective experience of the first breastfeeding session was used as the outcome variable.

Data analysis – Paper I

Statistical Package for the Social Sciences (SPSS) version 18.0 was used for the statistical analyses and the level of significance was set at a *p*-value of 0.05. Frequencies were calculated by descriptive statistics. To assess the associations between sociodemographic or obstetric factors and the hands-on approach, as well as a negative experience of the first breastfeeding session, univariate analyses were performed. Further, multivariate logistic regression was used to estimate the specific effect of the background variables on the hands-on approach and a second multivariate logistic regression was applied, with negative breastfeeding experience as the outcome variable. Odds ratios and 95% confidence intervals were calculated accordingly.

Study variables and outcome measures – Paper II

For Paper II, the aim of the study was to identify factors possibly associated with exclusive breastfeeding lasting less than two months. For this study the additional exclusion criteria were; a) women who gave birth prematurely (before 37 weeks), b) women who gave birth to twins, c) women who did not initiate breastfeeding, and d) women who did not receive or did not complete the breastfeeding questionnaire distributed at six months postpartum.

In addition to the variables used for Paper I, the breastfeeding questionnaire included a series of questions on initiation of formula or other solid food, for example, “At which age did your baby receive formula?” with the response options “XX weeks”, “XX months” or “not at all”. Mothers who had given their babies anything other than breast milk at any point from initiation to two months, and women who reported the discontinuation of breastfeeding, introducing formula feeding, were classified as not breastfeeding exclusively up to two months. Exclusive breastfeeding lasting less than two months was used as the outcome variable.

Data analysis – Paper II

Univariate analyses were performed to assess the possible associations between exclusive breastfeeding lasting less than two months and sociodemographic and obstetric factors and the mothers’ subjective experiences. Odds ratios and 95% confidence intervals were calculated.

A multivariate logistic regression model was fitted to estimate the specific effect of the background variables (included for the clinical relevance and a review of the previous literature), on exclusive breastfeeding lasting less than two months postpartum. Variables included in the model were body mass index, parity, subjective emotional distress during pregnancy, giving birth by cesarean section, epidural anesthetics, hands-on approach during the first breastfeeding session, and postponed first breastfeeding session. Adjusted odds ratios and 95% confidence intervals were estimated. The C index, equivalent to the area under the receiver operative characteristics curve, was used to assess the discriminative ability of the model. By rescaling the regression coefficients from the results of the multivariate logistic regression, on a scale from one to ten, a nomogram was created. Hence, the nomogram is a re-representation of the logistic regression model, in order to make it easier to apply the model without having to use the actual regression equation. By using bootstrap methods, the internal validation of the final model, both regarding discrimination and calibration, was performed (116). SPSS version 20.0 and R version 3.1 were used for the statistical analyses. The level of significance was set at a *p*-value of 0.05.

Study population and design – Paper III

The research undertaken for Paper III was part of the BASIC (Biology, Affect, Stress, Imaging and Cognition) project, a population-based longitudinal study ongoing since 2009, which to date includes more than 5000 pregnancies and focuses on antenatal and postnatal maternal psychological wellbeing. All women attending the routine ultrasound examination, in gestational weeks

17–20, at the Uppsala University Hospital, receive written information about the project and are invited to participate. Inclusion criteria at recruitment include the ability to adequately communicate in Swedish, no confidentially kept personal data, no blood-borne infectious diseases, healthy pregnancies as diagnosed by the routine ultrasound, and aged above 18 years. After obtaining consent, participating women are asked to complete self-administered web-based questionnaires at recruitment, at gestational week 32, and at six weeks and six months postpartum. Apart from completing web-based questionnaires that include psychometric measures and demographic data, some of the participating women also contributed by providing samples, for example, blood, saliva and cerebrospinal fluid, although these samples were not included in Paper III. Because the link to the web-based questionnaires is sent by e-mail, reminders are equally sent by e-mail to the women who might have forgotten to answer one of the questionnaires. Paper III presents the findings of a sub-study of the BASIC-project, based on data collected from February 2014, to June 2016. Additional exclusion criteria were: women who gave birth before the 36th gestational week, had missing values for gestational week at birth, gave birth in another hospital, did not initiate breastfeeding, mothers of twin pregnancies, and repetitive participants due to a new pregnancy.

Study variables and outcome measures – Paper III

Information on parity, mode of giving birth, use of local epidural anesthesia, as well as obstetric complications in pregnancy and postpartum complications, were obtained from the medical records. Complications in pregnancy is a variable created by combining seven different variables, namely: 1) vaginal bleeding during pregnancy, 2) significant Braxton-Hicks contractions, 3) symphysiolysis, 4) diabetes, 5) hypothyroidism, 6) hypertonia, and 7) preeclampsia. Likewise, postpartum complications refer to hemorrhage > 1000 ml, manual placenta expulsion, Apgar score < 7 at five minutes, admission to the neonatal unit, or laceration grade III or IV.

The first web-questionnaire, answered by the women in gestational weeks 17–20, included variables such as age, body mass index before pregnancy, educational level, smoking during pregnancy, medical history of depression and employment status. Six weeks postpartum, the women answered questions on the timing of the first breastfeeding session after birth, experience of the first breastfeeding session, and the use of the hands-on approach during the first breastfeeding session. Depressive symptoms during pregnancy were determined by the Swedish version of the Edinburgh Postnatal Depression Scale (EPDS) at gestational weeks 17–20 and/or gestational week 32. In line with previous studies, a score of ≥ 13 was considered indicative of the presence of depressive symptoms (117). The EPDS was also used for evaluation of depressive symptoms in the postpartum period, and particularly at six

weeks postpartum. As recommended (118), a cut-off of ≥ 12 was used. Exclusive breastfeeding, self-reported by the women, at six weeks postpartum was used as the main outcome variable, dichotomized into exclusive breastfeeding versus partial breastfeeding or not breastfeeding at all at six weeks postpartum.

Data analysis – Paper III

To assess the possible associations of the study variables with breastfeeding or not within two hours after birth and breastfeeding at six weeks postpartum, univariate analyses were performed. Odds ratios and 95% confidence intervals were calculated with SPSS. A multivariate logistic regression model was fitted, to estimate the specific effect of breastfeeding initiation later than two hours after birth and depressive symptoms during pregnancy on exclusive breastfeeding at six weeks postpartum. Based on existing literature and available variables, we created a directly acyclic graph (DAG) to identify potential mediators and confounders. According to the DAG, a total effect model and a direct effect model were created.

To explore the interplay between depressive symptoms during pregnancy and breastfeeding initiation later than two hours after birth, we created a composite variable and investigated association with the outcome variable. The composite variable included the following categories: a) Women with no depressive symptoms during pregnancy who initiated breastfeeding within two hours after birth (set as the reference category); b) Women with no depressive symptoms during pregnancy who initiated breastfeeding after two hours postpartum; c) Women with depressive symptoms during pregnancy who initiated breastfeeding within two hours after birth; and d) Women with depressive symptoms during pregnancy who initiated breastfeeding after two hours postpartum. SPSS version 24 was used for the statistical analyses. The level of significance was set at a *p*-value of 0.05.

Study population and design – Paper IV

The fourth study (Paper IV) was based on the initial phase of the ongoing project “Narratives of breastfeeding”, which is a collaboration between the faculties of medicine and humanities at the Uppsala University. “Narratives of breastfeeding” is a qualitative research project, starting with an interview during pregnancy, followed by a diary being kept by the respondents during the first fourteen days postpartum, and an interview held approximately two months postpartum or when appropriate for the informants. The study reported in Paper IV includes the interviews conducted during pregnancy. Swedish-speaking women with an intention to breastfeed were invited to participate in

the study. Respondents were recruited during parental classes at three maternity centers allocated in both urban and rural parts of Uppsala County during October to December 2017. The first and second author of the study held a short oral presentation of the study during the parental classes and distributed written information. Some midwives took on the task of distributing the information, both orally and written, during personal visits. We also put up posters presenting the study in the waiting-room areas of the maternity centers. The women were given the study e-mail address to announce their interest in participation. Some of the responding women had friends who were also interested in participating, hence three women were recruited through snowball technique. A semi-structured interview guide with open-ended questions was constructed by the research team. A pilot interview was held in spring 2017 to validate the wording of the questions of the semi-structured interview guide. No changes were needed and therefore the pilot interview was included in the study.

Data collection – Paper IV

Except for the pilot interview, all interviews were held during October 2017 through January 2018. The women were interviewed by telephone or face-to-face, depending on the respondents' choice. All the interviews were held in Swedish and audio-recorded. The interview guide included open-ended questions. After initial questions on age, pregnancy-week, parity, education, work situation and family status, the questions on breastfeeding commenced with: "Please explain what the word 'breastfeeding' means to you". Other questions were formulated, such as: "What have you heard about breastfeeding?", "How are you planning to feed your baby?", and "What does breastfeeding support mean to you?" To gain a deeper understanding, phrases such as "Please tell me more" and "Explain what you mean" were used. The interviews lasted between 20 and 50 minutes with an average of 30 minutes. All interviews were conducted, audio-recorded and transcribed verbatim by the first author.

Data analysis – Paper IV

The analysis process was conducted following Braun and Clarke's description of thematic analysis (119). The analysis began while transcribing the interviews when patterns of meaning were noticed. An initial understanding appeared by reading through each transcript multiple times. Initial codes were identified, and extracted into paper strips, and manually grouped into initial themes. The codes were re-grouped several times, initially by the first author and later together with the whole research team. To find relationships between the themes, thematic maps were created. All codes and themes were compared

and re-organized several times, until the authors agreed on the themes and the overarching theme of the study.

Two of the authors are midwives with clinical experience of postpartum care and breastfeeding support and one author is a physician, specializing in psychiatry with additional clinical experience of obstetric care and breastfeeding support. The remaining author is a humanities/gender studies scholar, specialized in narratives about parenthood. While constructing the interview guide and throughout the analysis the authors brought their different disciplines and critical conventions to bear on formulations and structure, thereby paying attention to preunderstandings that could influence the analysis.

Ethical Considerations

The women participating in any of the four studies included in this thesis were given oral and written information about the respective study, and were told that their participation was voluntary and that they could withdraw their participation at any time, in line with the Declaration of Helsinki (120). Further, the participants were informed that all the collected data would be treated confidentially so that identification of any particular participant would be impossible. Written consent was obtained from all the participating women.

The study protocol of UPPSAT (Papers I & II) was approved by the Regional Research Board in Uppsala, Sweden (Dnr 2006/150). Because the UPPSAT study investigated correlates of postnatal depression and included the Edinburgh Postnatal Depression Scale (EPDS), the total EPDS score of the participants was calculated on a weekly basis. Women with a high EPDS score and/or answering indicating suicidal thoughts or plans, were contacted by one of the study physicians and referred to a psychologist or a psychiatrist when required.

The study protocol of the BASIC project (Paper III) was approved by the Regional Research Board of Uppsala, Sweden (Dnr 2009/171). Likewise, as for the UPPSAT study, participants were contacted by a study researcher if severe depressive symptoms were disclosed within the web-based questionnaires, and referred to a psychologist or a psychiatrist, if needed.

The study reported in Paper IV was approved by the Regional Research Board of Uppsala, Sweden (Dnr 2017/256). All informants were given information about the audio-recordings of the interviews and were told that the data would be treated confidentially. In addition to the interviews that were held antenatally, the study “Narratives of breastfeeding” included a written or spoken (via a mobile phone app) diary during the first two weeks postpartum and a follow-up interview approximately 2 months postpartum (data yet not analyzed). The participants received information and contact details to the researchers. If the participants would express breastfeeding problems or depressive symptoms at any stage, they would be given practical advice and clinical

guidance by either the research midwives or the research physician and would be referred to a breastfeeding clinic or psychiatrist if needed, depending on the severity of their eventual problems. The research midwives have extensive experience of maternity care and breastfeeding support, while the physician of the research team is specialized in psychiatry and has experience of obstetric care and breastfeeding consultation.

Results

General results Papers I & II

In the whole of the UPPSAT study, 2493 women (of 3863 eligible women) gave consent to participate and 2318 women answered at least one of the three questionnaires. The additional questionnaire on breastfeeding that was included in the third questionnaire six months postpartum was sent to 1569 women, and 879 women sent it back. See the flowchart (*Figure 1*) for an overview of the participants included in Papers I and II.

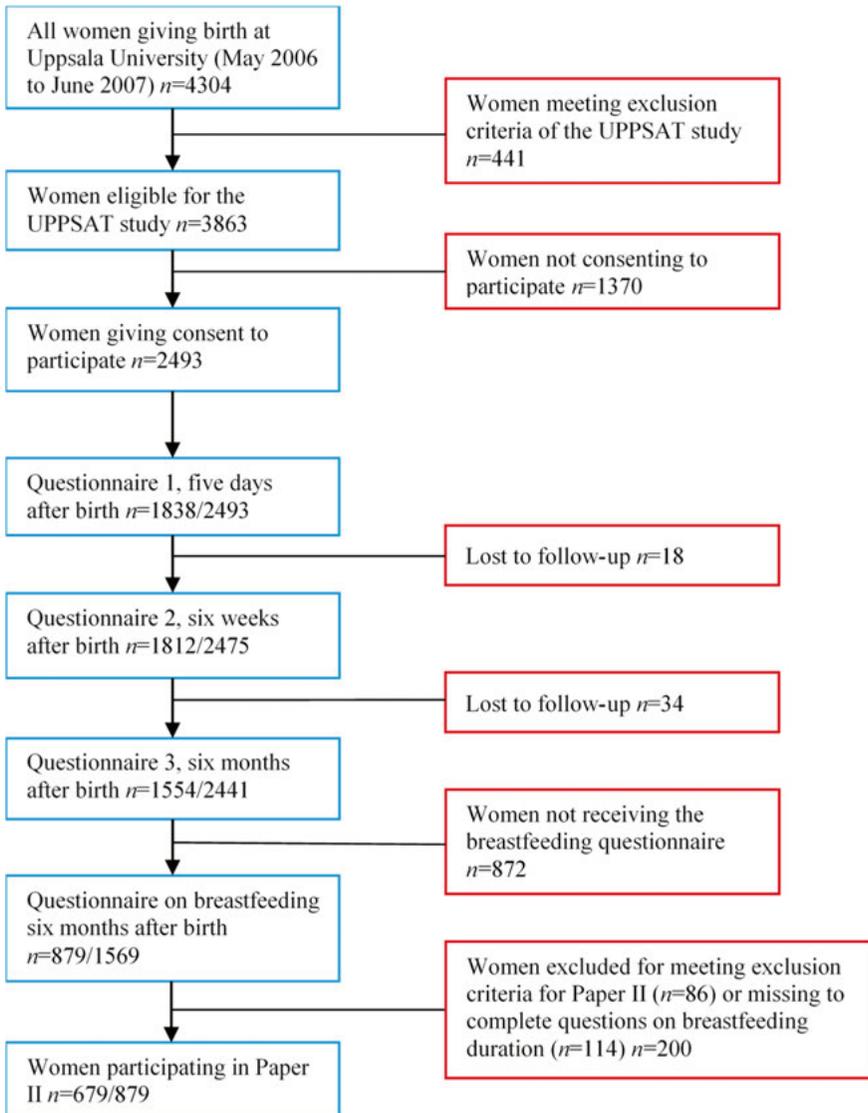


Figure 1. Flowchart of participants in Papers I and II.

Paper I

Characteristics

Participants' mean age was 30.6 years (SD 4.4 years). Sixty-one percent of the women had a higher level of education, i.e., a university degree. Fifty percent were first-time mothers, and 99% were married or cohabitating. Sixteen percent of the women had given birth via cesarean section. Seventy-four percent of the women had their first breastfeeding session at the delivery ward, whereas the remaining women reported that the first breastfeeding session occurred in the maternity ward or elsewhere, which indicates a postponed first breastfeeding session of at least two hours. Eight percent of the women reported having had a negative experience of the first breastfeeding session.

Findings

Of the women who participated in the study reported in Paper I, 38% experienced the hands-on approach during their first breastfeeding session.

Multivariate logistic regression analysis was carried out with the hands-on approach as the outcome variable, and with the obstetric/lifestyle variables as the predictor variables. The results showed that women with a body mass index of over 25 kg/m², being a first-time mother, postponed breastfeeding initiation, and a low maternal educational level had a significantly increased risk of receiving the hands-on approach during the first breastfeeding session.

Further, the hands-on approach was found to be associated with a negative first breastfeeding experience, even after adjusting for possible confounders such as body mass index, parity, postponed breastfeeding initiation, experience of giving birth, previous psychiatric contact, the woman's age and the presence of stressful life events during the past six months. See *Table 2* for the results of the multivariate logistic regression analysis.

Table 2. Multiple logistic regression-derived odds ratio (OR) and 95% confidence intervals (CI) for a negative experience of the first breastfeeding session in relation to hands-on approach during the first breastfeeding session

Variable		Model I OR (95% CI)	Model II OR (95% CI)	Model III OR (95% CI)
Hands-on ^a	No	1	1	1
	Yes	4.48 (2.57–7.82)	2.48 (1.22–5.04)	2.37 (1.02–5.50)
BMI ^b	≤ 25		1	1
	> 25		1.71 (0.90–3.24)	1.90 (0.87–4.17)
Parity	Multipara		1	1
	Primipara		1.76 (0.85–3.66)	1.88 (0.78–4.54)
Place/setting	Delivery unit		1	1
	Other ^c		2.93 (1.54–5.56)	3.16 (1.42–7.05)
Birth experience	Positive		1	1
	Negative		2.28 (1.22–4.28)	2.45 (1.13–5.33)
Previous psychiatric contact	No		1	1
	Yes		1.96 (1.01–3.80)	2.22 (0.99–4.94)
Age (years)	25–34			1
	< 25			0.99 (0.21–4.73)
	≥ 35			0.51 (0.14–1.90)
SLE ^d during the previous six months	≤ 1			1
	≥ 2			2.00 (0.87–4.56)

^aHands-on approach at the first breastfeeding session

^bBody Mass Index

^cMaternity unit, Neonatal Intensive Care Unit or elsewhere, which consequently indicates a postponed first breastfeeding

^dStressful life event

Paper II

In the study reported in Paper II, 679 women completed the questions regarding exclusive breastfeeding duration.

Characteristics

Among the women who participated, the mean age was 30.7 years (SD 4.3 years). Twenty-eight percent had a body mass index equal to or over 25 kg/m². Sixty-two percent of the women had a higher level of education and 46% were

first-time mothers. Ninety-nine percent of the women were married or cohabitating. Thirteen percent of the women gave birth by cesarean section. Twenty-three percent of the mothers reported subjective emotional distress during pregnancy, and 23% had a previous psychiatric contact. Seventy-nine percent of the women had their first breastfeeding session at the delivery ward. Seventy-seven percent of the women had breastfed exclusively for at least two months.

Findings

In the present study, 36% of the participants experienced the hands-on approach during their first breastfeeding session. The univariate analyses showed increased odds of exclusive breastfeeding less than two months postpartum if women reported having a body mass index over 25 kg/m², being a first-time mother, previous psychiatric contact and/or experienced emotional distress during pregnancy. Giving birth through cesarean section and/or the use of epidural local anesthetics during delivery was also associated with exclusive breastfeeding lasting less than two months postpartum. Furthermore, women exposed to the hands-on approach during the first breastfeeding session and women breastfeeding for the first time in the maternity ward, i.e., postponed breastfeeding, were at higher risk of reporting exclusive breastfeeding lasting less than two months postpartum. Women who reported a more negative experience of the first breastfeeding session were less likely to breastfeed exclusively at two months postpartum.

In the multivariate logistic regression (see *Table 3*), primiparity, subjective emotional distress during pregnancy, and giving birth by cesarean section, were all independently associated with exclusive breastfeeding lasting less than two months postpartum. The use of EDA during birth and postponed breastfeeding initiation nearly reached significance with exclusive breastfeeding lasting less than two months.

Figure 2 shows the nomogram, with variables from the multivariable analysis, weighted in order to reflect their effect size in predicting exclusive breastfeeding equal to or more than two months postpartum. For each predictor, a point is assigned on the 0–10 scale at the top. The sum of points gives a total score, which reflects the probability of exclusive breastfeeding at two months postpartum. As an example, consider a first-time a mother (8 points) reporting emotional distress during pregnancy (8 points) who gave birth by cesarean section (10 points), and who had a postponed breastfeeding initiation (6 points). The total number of points is 32, corresponding to a probability of exclusive breastfeeding for two months or more of approximately 37%.

Table 3. *Multivariate logistic regression model for factors associated with exclusive breastfeeding lasting less than two months postpartum*

Variable		Adjusted OR for EBF ^a <two months (95% CI)
BMI ^b (kg/m ²)	< 25	1
	≥ 25	1.45 (0.90–2.32)
Parity	Multipara	1
	Primipara	2.15 (1.32–3.49)
Emotional distress during pregnancy	No	1
	Yes	2.21 (1.35–3.62)
Cesarean section	No	1
	Yes	2.63 (1.34–5.17)
EDA ^c during labor	No	1
	Yes	1.55 (0.98–2.46)
Hands-on approach ^d	No	1
	Yes	1.34 (0.83–2.16)
Place/setting during first breastfeeding session	Delivery ward	1
	Maternity ward ^e	1.75 (0.99–3.09)

^aExclusive breastfeeding

^bBody Mass Index

^cEpidural local Anaesthetics

^dDuring the first breastfeeding session

^eMaternity ward, which consequently indicates postponed first breastfeeding session

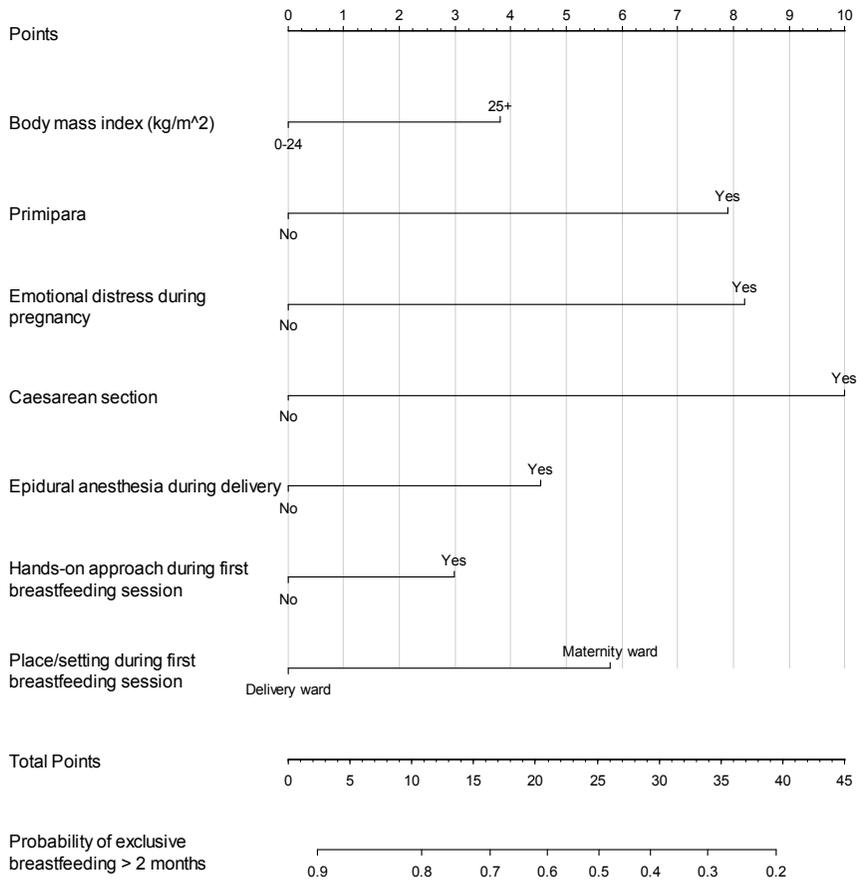


Figure 2. Nomogram for probability of exclusive breastfeeding > two months post-partum.

Paper III

In the whole of the BASIC study, 1816 women (of 8424 eligible women) gave consent to participate during February 2014 to June 2016. In total, 1217 of those women were included in our study (Paper III), as 284 pregnancies met the exclusion criteria (women who gave birth before the 36th gestational week, had missing values for gestational week at birth, gave birth in another hospital, did not initiate breastfeeding, as well as mothers of twin pregnancies and repetitive participants due to a new pregnancy). See *Figure 3* for an overview of the participants included in Paper III.

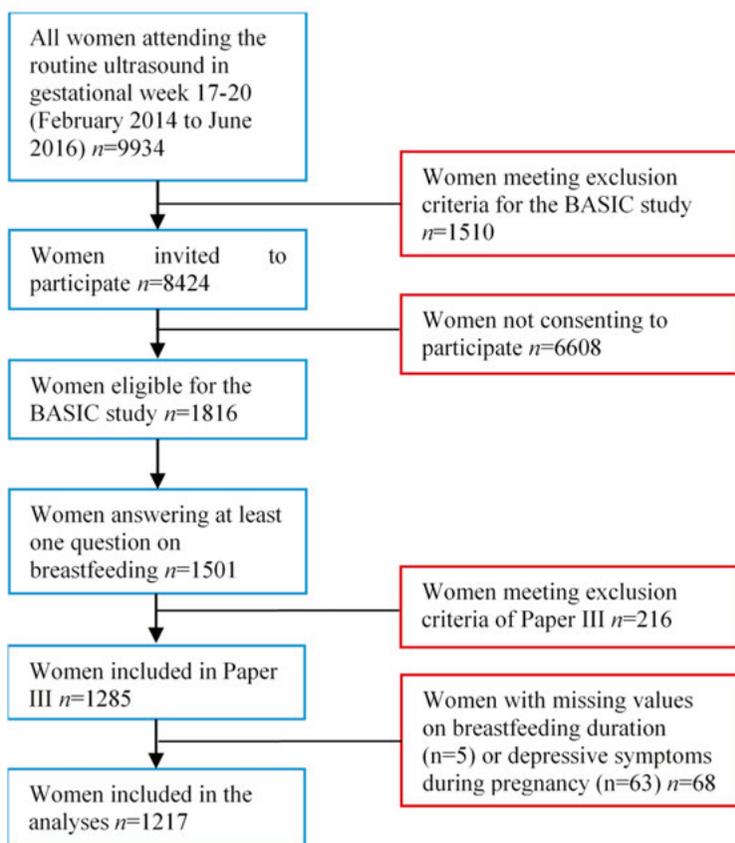


Figure 3. Flowchart of participants in Paper III.

Characteristics

The mean age of the women who participated was 31.4 years (SD 4.5 years). Seven percent of the women had a body mass index between 30–34.9 kg/m² and 1% of the women had a body mass index of 35 kg/m² or above before pregnancy. Eighty percent of the women had a college or university education, and 92% were employed or studying. Forty-seven percent of the women were first-time mothers. Seventy-nine percent of the women gave birth vaginally. Thirteen percent experienced depressive symptoms during pregnancy. Seventy-eight percent of the women reported initiation of breastfeeding within two hours after birth, and 77% reported that they were breastfeeding exclusively at six weeks postpartum.

Findings

The univariate analysis showed that factors correlating to a delayed breastfeeding initiation were; primiparity, body mass index equal to or over 35 kg/m², planned or emergency cesarean section and vacuum extraction, use of epidural anesthesia during labor, and postpartum obstetric complications. Furthermore, initiation of breastfeeding more than two hours after birth was associated with a negative experience of the first breastfeeding session and experience of the hands-on approach during the first breastfeeding session. Twenty percent of the women who participated experienced the hands-on approach during their first breastfeeding session.

Further, univariate analyses showed that background factors associated with increased odds of not breastfeeding exclusively at six weeks were age below 25 years, primiparity, low education, being unemployed, and increasing body mass index. Women with a history of depression were less likely to breastfeed exclusively at six weeks postpartum, as were women with depressive symptoms during pregnancy. Medical pregnancy and postpartum complications and cesarean births were also associated with not breastfeeding exclusively at six weeks postpartum. During the first breastfeeding session, a delayed initiation of more than two hours, a self-reported negative experience and the experience of the hands-on approach were negative predictors of exclusive breastfeeding at 6 weeks postpartum. Women who reported depressive symptoms at six weeks postpartum were also more likely to report partial or cessation of breastfeeding.

According to the multivariate logistic model 2 (see *Table 4*), both the presence of depressive symptoms during pregnancy and not initiating breastfeeding within the first two hours after birth were independent significant predictors for not breastfeeding exclusively at six weeks postpartum. Other variables significantly associated with not breastfeeding exclusively at six weeks were a lower level of education, planned cesarean section, history of depression, the use of the hands-on approach during the first breastfeeding session and a negative experience of the first breastfeeding session.

When combining depressive symptoms during pregnancy and time of breastfeeding initiation, women with depressive symptomatology who did not breastfeed within the first two hours after birth were at the highest risk for not breastfeeding exclusively at six weeks postpartum. The odds ratios were adjusted for mother's age when giving birth, parity, educational level, mode of birth, history of depression, breastfeeding experience, and the hands-on approach during the first breastfeeding session. See *Figure 4*.

Table 4. *Multivariate logistic regression results for not breastfeeding exclusively at six weeks postpartum.*

Variables		Model 1 ^a OR (95% CI)	Model 2 ^b OR (95% CI)
Mothers age when giving birth (1-year increment)		1.01 (0.98–1.05)	1.01 (0.97–1.05)
Parity	Multipara	1	1
	Primipara	1.44 (1.03–2.01)	1.10 (0.77–1.58)
Educational level	College/university	1	1
	High school or lower	1.94 (1.34–2.81)	1.91 (1.31–2.79)
Mode of birth	Vaginal birth/vacuum extraction	1	1
	Planned cesarean section	2.25 (1.42–3.55)	1.98 (1.24–3.18)
	Emergency cesarean section	0.92 (0.55–1.54)	1.01 (0.59–1.72)
Breastfeeding within 2 hours after birth	Yes	1	1
	No	2.61 (1.80–3.78)	1.96 (1.31–2.93)
Depressive symptoms during pregnancy ^c	No	1	1
	Yes	1.93 (1.28–2.91)	1.70 (1.08–2.57)
History of depression	No		1
	Yes		1.47 (1.06–2.05)
Hands-on approach ^d	No		1
	Yes		2.48 (1.71–3.59)
Breastfeeding Experience ^d	Positive		1
	Negative		1.70 (1.03–2.82)

^aTotal effect model

^bDirect effect model, examining also the effect of mediator variables in the association of interest.

^cEPDS \geq 13

^dDuring the first breastfeeding session

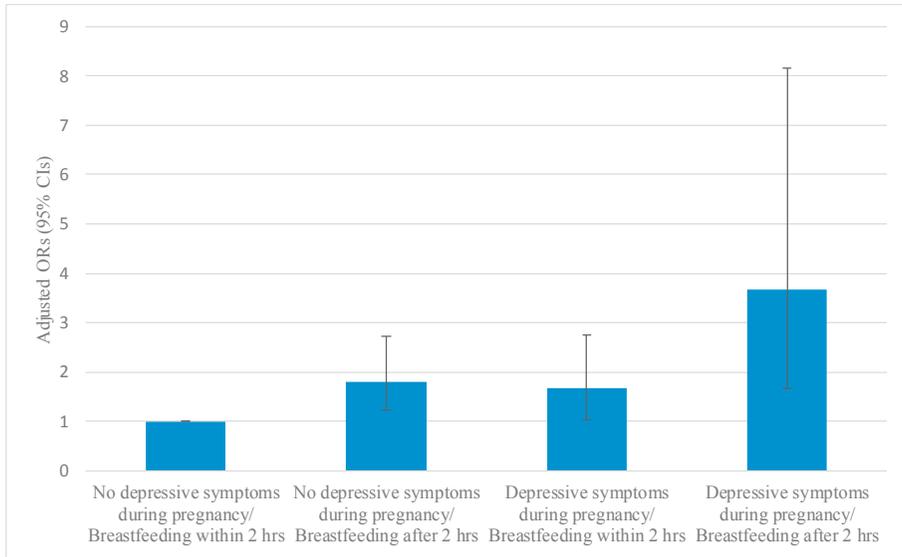


Figure 4. Multiple logistic regression analysis derived Odds Ratios (OR) and their 95% Confidence Intervals (95% CI) on the combined effect of depressive symptoms during pregnancy and breastfeeding or not within two hours after birth on the odds of not breastfeeding exclusively at six weeks postpartum.

Paper IV

Characteristics

Ten nulliparae women and one primiparous woman participated in the study. All interviews, except one, were conducted through telephone and were held in pregnancy week 34–40 (mean range 36). Their age varied between 27 to 37 years, with a mean range of 30.6 years. Nine of the women had a university degree, and likewise, nine women were employed, while the two remaining women were between jobs or studying. All participating women were cohabiting with the father of the expected baby and had their residence in both rural and city areas.

Findings

The overarching theme, “Breastfeeding as a balancing act between societal norms and personal desires”, consisted of two themes: “Conflicting societal norms stabilized by women’s knowledge”, and “Envisioning breastfeeding”. Subthemes were defined within each theme (see *Figure 5*).

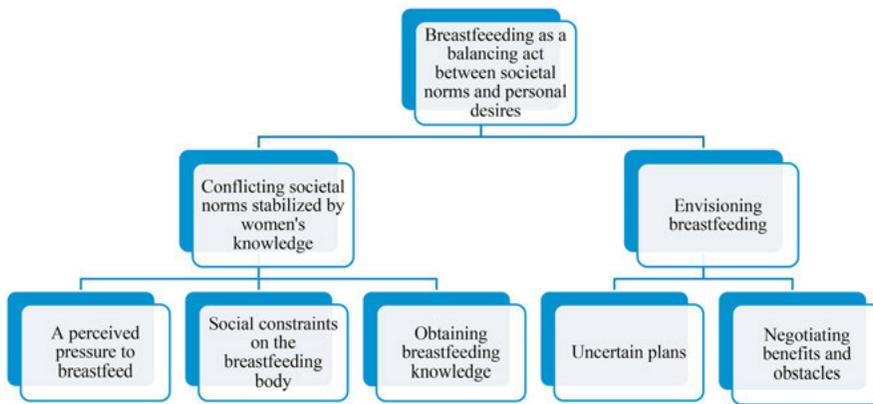


Figure 5. Overview of the overarching theme, themes and subthemes

The theme “Conflicting societal norms stabilized by women’s knowledge” represents the women’s thoughts on a perceived pressure to breastfeed from society, yet one that was balanced by their own knowledge about breastfeeding.

Some women described breastfeeding information, received both from society and from health care professionals, as propaganda about health benefits, which could lead to feelings of guilt and being seen as an inferior mother if they did not succeed with breastfeeding. For some, information on breastfeeding benefits gave a feeling of being subjected to information that was not trustworthy. Most of the women experienced having received mixed messages from society. On the one hand, they felt a pressure to breastfeed, but on the other, they felt that there were many rules on how, where and when to do it or not to do it and for how long. Some women also perceived society as having sexualized the female body in the context of breastfeeding. Although seen as an issue more common in other countries than Sweden, some women mentioned that it could be problematic to breastfeed in public.

Aside from the knowledge that women had gained through their midwife or by reading books, media or on the Internet, they had all shared their thoughts on breastfeeding with family and friends. Most stories told by family and friends focused on breastfeeding problems, describing breastfeeding as a challenge. Nevertheless, according to the women, these stories gave comfort, hope and time for preparation, and reassured them that it would be okay whatever happened and that the pressure of breastfeeding somewhat faded. At the same time, these stories provided a reason for not taking successful breastfeeding for granted. Hence, most women expressed a need to discuss breastfeeding problems and different feeding methods during pregnancy, although they in general were satisfied with the amount of time their midwife had devoted to providing breastfeeding information.

The theme “Envisioning breastfeeding” represents the women’s perceptions of their future breastfeeding. While expressing a sincere wish to breastfeed, the women reported insecurity concerning their capability to succeed, and the wish to breastfeed often included phrases of insecurity, such as *...if possible, ...if I manage, I hope it (breastfeeding) works*. There was also a concern regarding breastfeeding duration. The women mentioned that it was difficult to speculate about the length of their own period of breastfeeding. Although mentioning a willingness to breastfeed according to recommendations, i.e., six months, some women mentioned that breastfeeding would last as long as they themselves wanted, while other commented that the baby would decide when to cease or that time would tell.

While thinking about their future breastfeeding the women were negotiating the benefits and obstacles of breastfeeding. The women regarded breastfeeding as snugly, convenient and flexible, compared to handling bottles and preparing formula, which was regarded as bothersome. Nevertheless, breastfeeding was also mentioned, by some women, as a possible obstacle to the father’s ability to bond with the baby, and stated that they perhaps would want their partner to bottle feed part-time to gain equality with their partner. Others mentioned that shared feeding could be supportive for themselves, as it would give the mother time to sleep at night or time on her own.

A concern, and awareness, among the women was facing potential breastfeeding problems, especially during the initiation of breastfeeding, which was regarded as a learning period that could determine, or define, the success or failure of the whole breastfeeding period. Breastfeeding problems were often described in the context of psychological well-being in which the well-being of the woman was seen as being more important than breastfeeding at any cost. Most of the women requested more information about breastfeeding problems, and how to solve them, during pregnancy. If facing future breastfeeding problems, the women expressed wishes of individualized support, provided by someone with experience, knowledge and calmness. Apart from perceiving breastfeeding initiation as troublesome, the women looked forward to experiencing the perceived benefits of breastfeeding, such as coziness and closeness to the baby.

Discussion

The main findings from this thesis suggest that the use of the hands-on approach was common among health care professionals during the first breastfeeding session, and was associated with a more negative experience of the first breastfeeding session. Further, primiparity, subjective emotional distress during pregnancy, and cesarean section were independently associated with exclusive breastfeeding lasting less than two months. Depressive symptoms during pregnancy and a postponed first breastfeeding session had a cumulative effect on the duration of exclusive breastfeeding at six weeks postpartum. Moreover, women described a balancing act between societal norms and personal desires when interviewed about breastfeeding during pregnancy and requested individualized breastfeeding support.

The hands-on approach

The hands-on approach was frequently used by caregivers during the first breastfeeding session, and was associated with a more negative experience of the first breastfeeding session. Negative effects due to the hands-on approach have also been identified in previous studies, leaving mothers with feelings of guilt and feeling as though they were treated as objects (3, 58, 66). According to studies on the newborn's innate behavior, most newborns latch on and breastfeed by themselves, if placed skin-to-skin with their mothers after birth. This innate behavior may be suppressed, if interventions disturb it (40, 45). Hence, there is no evident explanation as to why the hands-on approach was used during the very first breastfeeding session. Nevertheless, it was more commonly used in women with a high body mass index, first-time mothers, women with a postponed first breastfeeding session, and women with a low educational level. The reasons for these associations can only be speculated upon, but are possibly more related to preconceptions and prejudices among the health care staff than the mothers' and newborns' actual needs. Mothers who are overweight or obese are at higher risk of an early cessation of breastfeeding and it has been suggested that a lack of body comfort or confidence, more often found in overweight/obese women, might play an important role (34, 35). One could speculate that the caregivers' use of the hands-on approach towards women with a high body mass index might be caused by an idea that

it would be harder for overweight/obese women to find an appropriate breastfeeding position, and that they are in need for further help and instruction to attach the baby to the breast. While doing so, the caregivers might reinforce the idea that the mother needs help breastfeeding, hence possibly lowering her self-confidence. When it comes to first-time mothers, one could speculate that the caregivers see the woman as a novice, in need of technical expertise, thus using the hands-on approach in order to teach breastfeeding. If the newborn did not suckle during the first hours after birth, it was more possible that caregivers used the hands-on approach, possibly due to an imbedded personnel stress for the newborns nutritional status, thus using the hands-on approach as a “quick fix” or due to ignorance of the newborn’s natural breastfeeding behavior. It would be interesting to further explore the caregiver’s attitudes towards breastfeeding. Caregivers with regulating, disempowering or antipathetic attitudes towards breastfeeding may be unable to provide adequate breastfeeding support for mothers (71) and might possibly be more prone to using the hands-on approach. Educational programs taking breastfeeding attitudes into consideration may be fruitful for changing attitudes among health care professionals (72).

When considering possible negative effects of the hands-on approach, this practice was, in the present thesis, shown to be associated, even in the adjusted analyses, with a negative first breastfeeding experience. The experience of the hands-on approach during the first breastfeeding session might decrease a mother’s self-confidence in her ability to adequately feed her newborn on her own. Higher breastfeeding self-efficacy enhances the possibility of a longer breastfeeding duration (121) and for women who are taught to breastfeed in a way that makes them feel self-confident, the prevalence of sore nipples decreases (122).

In the studies reported in Papers II and III, the results also indicated that the hands-on approach, when used during the first breastfeeding session, might influence the duration of exclusive breastfeeding negatively. The hands-on approach probably evokes feelings of failure and insecurity among mothers. When forcing a baby to the breast, the baby’s rooting reflexes may also be affected, making it harder to get the baby to latch on by disturbing the baby’s placement of the tongue (123). Hence, the hands-on approach might result in initiating an insufficient latch, which might lead to problems with sore nipples and pain. Further, this rather brutal start to breastfeeding may linger and affect forthcoming breastfeeding sessions. For example, it has been suggested that women who succeed at breastfeeding in the early period after birth have higher levels of self-confidence in breastfeeding in the late postpartum period (124).

Despite the fact that, because of the layout of the questionnaire, women did not formally have the possibility to describe why the first breastfeeding session was a negative experience, several of them felt so strongly about the issue that they left notes on the margins of the page. One mother, first breastfeeding

in the delivery ward after receiving the hands-on approach, wrote: “I wish I could have had more time so that the baby could have found my breasts on his own. It went so fast from the moment of birth until they helped him finding the breast”. Another woman wrote: “After a short while they used their hands.” Evidently, time restraints can be a barrier to hands-off breastfeeding support. A perceived lack of time, or shortage of staff, might be one of the reasons why caregivers choose, or perceive themselves as obliged, to use the hands-on approach during the first breastfeeding session. Time restraints hinder midwives from carrying out breastfeeding support as a skilled companion, but instead force them to have to manage their breastfeeding support as a technical expert who sees the woman as a novice, according to Swerts et al. (69).

Notably, both the UPPSAT study and the BASIC study were conducted in the same hospital, but with approximately eight to ten years in between. The study reported in Paper I, carried out in 2006 through 2007 (a sub-study of UPPSAT) showed that 38% of the women received the hands-on approach during the first breastfeeding session, while in the study reported in Paper III, conducted in 2014 through 2016 (as a sub-study of BASIC), 20% of the women had the same experience. Discussions among the personnel about the possible negative effects of the hands-on approach might be the reason for this potential decline at the same hospital.

However, it could be possible that some women found the hands-on approach helpful, but, because the results indicate an overall association between the hands-on approach and a more negative experience of the first breastfeeding session, as well as a shorter duration of exclusive breastfeeding duration, this method should be questioned, and used only after careful consideration. These results make us believe that by using the hands-on approach during the first breastfeeding session, the women’s belief in her own capacity might be affected negatively, thus contributing to a shorter breastfeeding duration. By providing consistent breastfeeding support without using a hands-on approach that forces the baby to the breast and instead promotes women’s ability to breastfeed on their own, an increase in a positive first breastfeeding experience would be possible.

Risk factors for exclusive breastfeeding lasting less than two months

Being a first-time mother, experiencing emotional distress during, and/or giving birth by cesarean section pregnancy were the strongest predictors for breastfeeding exclusively of less than two months postpartum according to the results presented in Paper II.

Breastfeeding duration has previously been shown to be shorter amongst first-time mothers (27, 80), as confirmed in the study reported in Paper II.

Depression and/or anxiety prior to or during pregnancy and postpartum are factors known to negatively affect breastfeeding (13, 42, 125), but these associations have been challenged in a recent study (102). Nevertheless, our results demonstrate an association between emotional distress during pregnancy and a shorter exclusive breastfeeding duration. The underlying factors of this association may conjoin. Emotional distress decreases a woman's self-confidence regarding breastfeeding, which in turn predicts breastfeeding duration (94). Further, there is no clear routine screening procedure for depression and anxiety in antenatal care in Sweden. However, depending on local guidelines, midwives and obstetricians address this issue by asking questions about mental well-being.

Compared to vaginal birth, a cesarean birth includes several aspects that can affect breastfeeding rates, such as separation between mother and newborn, and delay of the first breastfeeding session (126-129). Further, cesarean births are often associated with pain in the first days postpartum, which can affect the mother's well-being and breastfeeding, and may cause more breastfeeding problems (126, 127). It has also been found that mothers who give birth by cesarean section have a lower breastfeeding self-efficacy, a predictor of breastfeeding success and duration, than women who give birth vaginally (130).

Worthy of discussion are the factors that almost reached statistical significance in the multivariable model and that were included in the nomogram, as the use of epidural local anesthetics during labor and postponed breastfeeding initiation. First-time mothers have a higher use of epidural local anesthetics (131), and studies show that the epidural local anesthetics can depress the newborns' innate reflexes in a way that postpone the first breastfeeding session (132). Initiating breastfeeding within the first hours of the newborn's life is an important factor for continuous breastfeeding (50-52) and alters self-confidence among mothers (65). The time between giving birth and initiation of breastfeeding is a care routine that is possible to modify, if prioritized. In any mode of giving birth, it should be possible to avoid separation or at least shorten the time of separation. The use of a nomogram is, to our knowledge, a new approach in this research area. It can help health care professionals in identifying women in need of extended breastfeeding support.

Depressive symptoms and breastfeeding initiation as variables that influence breastfeeding duration

In the study reported in Paper III, we identified a cumulative negative effect of the presence of depressive symptoms during pregnancy and a postponed first breastfeeding session on the duration of exclusive breastfeeding assessed by the participating women at 6 weeks postpartum. This indicates that women

with depressive symptoms during pregnancy might be more vulnerable to the consequences of a postponed first breastfeeding session later in the postpartum period. In our sample, one-fifth of the mother-newborn dyads did not have the opportunity to accomplish the first breastfeeding session within two hours after birth. When considering the results from the univariate analyses, where breastfeeding initiation two hours after birth was set as the outcome variable and a series of variables as predictive, this could be due to the separation of the mother and the newborn after a cesarean birth or another complication postpartum. At the Uppsala University Hospital, all newborns born by cesarean section are to be removed from the operating theater and separated from the mother, for a short period. If a midwife or nurse is not available to take responsibility for the infant in the recovery ward, the newborn will continue to be separated from the mother and thus the first breastfeeding session will be delayed. Women who experience larger vaginal tears or retained placenta might also be subjected to the same clinical routine. This routine of separating women from their newborns has been on the hospital agenda over the last few years, advocating for the co-caring of the mother-baby dyad even in the recovery ward. It has been shown that women who experience a cesarean birth or another complication more often initiate breastfeeding later than recommended because of routine labor ward practices (133). Therefore, introducing skin-to-skin contact between mother and child in the operating theatre and in the recovery ward enables an early breastfeeding initiation, thus enhancing the possibility of successful breastfeeding (134).

The administering of anesthetics during labor, more precisely use of the epidural local anesthetics, can affect the newborn's innate behavior. It has been suggested to affect the newborn's reflexes, making it more problematic for them to latch on, and therefore possibly complicating and postponing the first breastfeeding session (132, 135). This could be the reason why we found the same association within the results of the study reported in Paper III. Likewise, earlier studies have shown that obese women more often postpone the first breastfeeding session to more than two hours after birth than women of normal weight (30), which is in accordance with our results. Also, in our univariate analyses, primiparity was associated with a postponed breastfeeding initiation, illustrating the fact that women with no previous breastfeeding experience might be in greater need of targeted breastfeeding support, given that first-time mothers tend to breastfeed for a shorter period compared to multiparas (80). Notably, women with a postponed breastfeeding initiation were more likely to report both the use of the hands-on approach and a negative first breastfeeding experience, which is probably related to breastfeeding self-efficacy (55).

Seventy-seven percent of the participating women were breastfeeding exclusively at six weeks postpartum. Adjusted factors for an early discontinuation of breastfeeding or partial breastfeeding at six weeks postpartum were

being a first-time mother, low maternal education levels and depressive symptoms during pregnancy, which have all been investigated and illustrated in previous research (13, 28, 80, 101, 136). Likewise, planned cesarean section, as well as a postponed first breastfeeding session, were associated with not breastfeeding exclusively at six weeks postpartum. A woman undergoing a planned cesarean section for psychosocial reasons, such as, for example, fear of childbirth, might be more vulnerable (137), possibly having a lower self-confidence in birthing as well as in breastfeeding.

As shown in earlier research (13, 101, 138), women who breastfeed exclusively at six weeks had lower odds of having significant depressive symptoms than women who did not, as shown in the univariate analyses. Breastfeeding seems to be associated with decreased odds of postpartum depression, whereas early breastfeeding cessation or negative early breastfeeding experience, as indicated by breastfeeding aversion or severe breastfeeding pain, have been associated with a higher risk (125, 139). This potentially protective effect of breastfeeding against depressive symptoms has been suggested to be exerted via attenuation of the cortisol response to stress, oxytocin release, improvement of the mother's self-confidence, and her emotional involvement and interaction with the infant (13). Conversely, mothers with a history of depression or those who experience postpartum depression also more often report shorter breastfeeding duration (42, 125). These findings have been challenged in recent research, indicating that it is difficult to establish whether there is a casual association between depressive symptoms and breastfeeding (102). Nevertheless, as reported in Paper III, depression during pregnancy and late initiation of breastfeeding interacted in increasing the odds of non-exclusive breastfeeding at six weeks postpartum. Depressive symptoms, as well as the timing of the first breastfeeding session, are also linked to a lower breastfeeding self-confidence, implying that these women are in need of targeted and encouraging breastfeeding support to enhance the chances of a longer exclusive breastfeeding duration (94, 140).

Women's voices on breastfeeding, as formulated during pregnancy

The main theme in the study reported in Paper IV represents how women are balancing between societal norms and personal desires when thinking of their future breastfeeding. The two themes, "Conflicting societal norms stabilized by women's knowledge" and "Envisioning breastfeeding", express how the women find societal norms conflicting as society is pro breastfeeding, but on the other hand, how it restricts breastfeeding in terms of how and where to do it, and for how long. However, this conflict is balanced by knowledge that the women obtained from various sources, mostly from family and friends, with

their own experience of breastfeeding. Stories from family and friends often contained information about their struggles with breastfeeding problems. This knowledge relieved the pressure of breastfeeding success and gave comfort in that, if problems would occur, they would not feel alone. Simultaneously, this information nurtured an insecurity in relation to the capacity of breastfeeding among the women. The women therefore requested more information during pregnancy about potential breastfeeding problems, and how to solve them, and wished for individualized support during the initiation of breastfeeding.

Because breastfeeding was presented from both health care professionals and society as the best option, women described a societal norm or pressure to breastfeed in order to be regarded as a “good mother”. This link between breastfeeding and good mothering, and feelings of guilt if not succeeding breastfeeding, has been described previously (141, 142). Information about breastfeeding benefits were by some women regarded as propaganda, and sometimes as not even being trustworthy, although at the same time, the health benefits were crucial for choosing to breastfeed. Information about breastfeeding health benefits was also mentioned, by the women, to be problematic, as they could be a psychological burden if their breastfeeding would not be successful. Indeed, previous research has found that breastfeeding support might increase maternal stress if not being perceived as supportive (143). Nevertheless, the women reported that aspects other than the health benefits of breastfeeding were crucial as well, such as breastfeeding being practical and available at all times. As suggested in earlier research (144), it could be of importance to increase the amount of information provided to expectant parents on the practical aspects of breastfeeding and to give strategies for decreasing breastfeeding problems. Because not succeeding in breastfeeding may evoke feelings of shame and guilt and therefore may affect the emotional well-being of mothers, the challenges of exclusive breastfeeding need to be addressed and recognized (145).

A recent study shows that although the media presents a wide range of topics about breastfeeding, the articles seldom cover the factors that facilitate breastfeeding, but instead present barriers to breastfeeding (89). Whether this is the status in the Swedish media is unclear, but, this could indeed be one of the reasons why the women perceived breastfeeding as troublesome. Indeed, all the women reported feeling insecure about their capability to breastfeed and a worry about the initial stages of breastfeeding. Some women reported that negative experiences from others might help them not to feel lonely if breastfeeding problems would occur. Loneliness in motherhood might arise from self-comparison with perceived societal norms on mothering, as suggested in a recent study (146). A Swedish study comparing mothers’ experiences of breastfeeding over a decade, showed that women nowadays tend to experience breastfeeding as more difficult than before, and that they reported higher levels of insecurity (147). On the other hand, acknowledging both pos-

itive and negative breastfeeding experiences through individualized breastfeeding support that meets both psychosocial and emotional needs strengthens breastfeeding women (148).

All women perceived their partners as having a positive attitude towards breastfeeding. Most of the women had discussed breastfeeding with their partner and mentioned him as an important support in their future breastfeeding and some envisioned him taking care of household duties while she would breastfeed. Indeed, partner support is crucial and discussion on the topic, initiated by health care professionals, preferably should be held both prenatal and postpartum with both partners present (79). Some women expressed beliefs about the importance of sharing feeding with the partner for their partner's ability to bond with the baby and as a way to gain equality between the parents. Nevertheless, shared parenting and equal gender norms are related to positive breastfeeding intentions and longer breastfeeding duration (26, 149).

Most women thought that the support given to them directly after birth would be crucial for their breastfeeding period. Earlier research has stressed that the initiation of breastfeeding and the quality of breastfeeding support influences breastfeeding (143). Because most women perceived that breastfeeding was a challenge, they wished for adequate support from someone with experience, who also was knowledgeable and calm, representing professional values that must be acknowledged. By providing an environment that enables health care professionals to work within their role as a skilled companion (69) who has strengthening and facilitating attitudes towards breastfeeding (71), the health care system can better promote, support and sustain breastfeeding.

Theoretical reflections

The focus of this thesis has been on factors that influence breastfeeding, as well as breastfeeding attitudes among pregnant women. When pregnant and entering the Swedish maternity care service, women (and their partners) encounter several different persons with varying titles and education. Receiving contradictory advice regarding breastfeeding is a common experience among women. The first breastfeeding session might be affected by various health care practices such as the hands-on approach and separation between mother and child, leading to a postponed breastfeeding initiation. Moreover, societal and cultural aspects play an important role in influencing the attitudes towards breastfeeding.

By applying the social ecological model of health to the results, which considers the interplay of multiple levels of a social system and interactions between the individual and the environment, one can envision the pregnant or breastfeeding woman being influenced by both micro-level as well as macro-level factors. The analyses of breastfeeding initiation and duration revealed

statistically significant results at the individual, the interpersonal, and the organizational level of the social ecological model of health. On an individual level, we found that several background and psychological factors affect breastfeeding and breastfeeding duration. On the interpersonal level, stories from friends and family influenced the way in which the pregnant women thought about breastfeeding. On an organizational level, the hands-on approach and compliance with an early breastfeeding initiation influenced breastfeeding. To promote breastfeeding and support women who want to breastfeed, these factors need to be taken into account. By applying the social ecological model of health to the results it becomes evident that breastfeeding and breastfeeding duration is influenced by demographic, social, physical and psychological variables, hence breastfeeding is a complex phenomenon (4). By acknowledging that these factors are influencers of breastfeeding, health care professionals could give adequate, individual breastfeeding support, when needed. Further, some pregnant women perceive a pressure from society to breastfeed and an uncertainty regarding their capability to breastfeed. The results indicate opportunities to inform and support women in the prenatal and postpartum period in an effort to support breastfeeding. On an individual level, self-confidence and self-efficacy play an important role in breastfeeding. According to Bandura (111), different types of treatments or influences can explain and predict the level of self-efficacy, and self-efficacy could be altered by observational learning and verbal appraisals from trusted health care professionals. Furthermore, self-efficacy is derived from four sources, namely: performance accomplishments, vicarious experience, verbal persuasion, and physiological states, hence breastfeeding self-efficacy expectancies are based on the women's previous breastfeeding experiences, observations of successful breastfeeding, encouragement received from others, and a state of wellness (112). This is the first time, to our knowledge, that the hands-on approach during the first breastfeeding session has been investigated with a quantitative method. The hands-on approach appeared to be a common strategy used by caregivers during the first breastfeeding session and was also associated with a more negative experience of the first breastfeeding session and a shorter exclusive breastfeeding duration. When applying the self-efficacy theory, these results probably reflect earlier research of qualitative design, showing that the hands-on approach might bring out feelings of guilt among affected mothers (66). By guiding women in such a way that they are capable of breastfeeding by themselves, they gain positive experience of their own capacity (150). Furthermore, depressive symptoms during pregnancy might influence exclusive breastfeeding duration, but the duration may increase if an early initiation of breastfeeding occurs. Information and empowering conversations between the woman and her caregiver, where individual needs identifies, could alter women's levels of breastfeeding self-confidence.

Methodological considerations

Among the strengths of the studies reported in Papers I–III are the population-based design, the large number of participating women, and the availability of information on a series of possible confounders on an individual level.

As with the UPPSAT project, within which the studies reported in Papers I and II were included, the response rate of 56% is in accordance with studies of similar design. A nonresponse analysis for the total UPPSAT cohort showed no difference in age, gestational length, mode of giving birth, or place of residence between responders and non-responders, with the only difference being a slightly higher number of primiparas among responders. We have no reason to believe that responders differ from non-responders in a way that could bias the associations between the hands-on approach and the experience of the first breastfeeding session or associations with exclusive breastfeeding lasting less than two months.

As of the BASIC project, within which the study reported in Paper III was included, the response rate is approximately 22%, probably due to the extensive web-based questionnaires in combination with collection of, for example, blood samples. Compared to the general pregnant population, “older” women, women with a higher level of education and first-time mothers were slightly over-represented among the participants. Neither in the UPPSAT, nor in the BASIC project could we perform an attrition analyses on the prevalence of depressive symptoms, as we had no such data on the women who did not participate. However, earlier research indicates that depressive symptoms are more common among non-participants (151). On the other hand, the prevalence of perinatal depression in the BASIC study is very close to that of other studies. Hence, we believe that our results on the influence of depressive symptoms on breastfeeding are not greatly biased by selection bias.

A possible limitation of both studies is that mothers answered the questions on the first breastfeeding session six weeks (Paper III) and six months (Papers I–II) postpartum, posing an eventual problem of recall bias. Women’s experiences during the first six months might affect their memories of the event and the way they answer questions about it. It has, on the other hand, been shown that women, a long time after birth, are capable of successfully recalling what happened during the birth process and the early hours postpartum (152).

It is also possible to speculate that mothers who have a more negative attitude in general might have answered in a biased way concerning the experience of the breastfeeding session. The association between the hands-on approach and the experience of the first breastfeeding session was, nevertheless, adjusted for both previous psychiatric contact and stressful life events in the past six months. Of course, the use of hands-on approach cannot fully account for the women’s dissatisfaction with the first breastfeeding session because a majority of the women who received the hands-on approach had a positive experience of the first breastfeeding session.

Furthermore, it has been argued that retrospective evaluation methods systematically overestimate the duration of breastfeeding (153), and our prevalence of 77% of women breastfeeding exclusively for at least two months in both Papers II and III is similar to, or slightly higher than, that of breastfeeding rates in Uppsala county during the same years (approximately 76% and 71%, respectively) (1). However, studies on breastfeeding duration have reported no differences in the proportion of breastfeeding when comparing retrospective data with 24-hour recall (154).

Another possible limitation of the studies reported in Papers I–III is that the question about intention to breastfeed was not directly posed, as we assumed that nearly all mothers had planned to breastfeed. Indeed, only women initiating breastfeeding were included in the respective studies. One must also consider that we have no data on what kinds of breastfeeding support were available for the participating women, which indeed can be crucial for breastfeeding duration.

The question on emotional distress during pregnancy used in the study reported in Paper II is not validated, although it is the question recommended for midwives in antenatal care to ask during pregnancy, according to the Swedish Society of Obstetrics and Gynecology (155). One must also take into consideration that the Edinburgh Postnatal Depression Scale, used in the study reported in Paper III, only detects depressive symptoms and does not provide a diagnosis of clinical depression, although it is widely recognized in medical research and has also been translated and validated in Swedish (117). For detecting other life stressors, we also used the Stressful Life Event Scale by Rosengren et al. (115). Experience of more than two stressful life events during the last year has earlier been associated with postnatal depression (156). Further, stressful life events during pregnancy increases the odds of an early cessation of breastfeeding (157).

Another limitation might refer to the fact that postponed breastfeeding was defined in Papers I and II by the place in which the first breastfeeding session occurred. Due to hospital routines, we know that women who answered that their first breastfeeding session took place in the maternity ward would have had a postponed breastfeeding initiation of at least two hours. When designing the questionnaire for the study reported in Paper III, this issue was taken into account by specifically ask the participating women when they breastfeed for the first time, i.e., before or later than two hours after birth.

Formula supplementation during hospital stay is a predictor for not breastfeeding exclusively at a later stage, when given without medical reason (51). However, In Paper II, women who responded that formula was given to their newborn during the hospital stay were grouped into “exclusive breastfeeding lasting less than two months” because their newborns had been given something other than breastmilk before two months of age. Regarding the study reported in Paper III, formula supplementation during the hospital stay was not specifically addressed in the analyses, as the focus of the study was the

interplay between depressive symptoms during pregnancy and the timing of the first breastfeeding session. The hospital policy is that any supplementation given for medical reasons should be distributed after the newborn's first breastfeed. Further, due to suboptimal journal notes on the reasons for formula supplementation, we decided not to use the variable in the analyses.

In Paper II, one could also speculate whether it would be of interest to separate emergency cesarean section from planned cesarean section. This was indeed performed in the univariate analyses, and showed that both these groups had significantly higher odds of exclusive breastfeeding lasting less than two months. Therefore, these groups were analyzed together in the multivariable analyses. We also stratified the analyses by mode of birth in Study III, which led to our finding of the associations between depressive symptoms in pregnancy and late breastfeeding initiation after birth, respectively, and not breastfeeding exclusively at six weeks postpartum, remained significant only in the group of women who gave birth vaginally.

The use of a nomogram, as in Paper II, is, to our knowledge, a new approach in this research area, identifying women who need targeted breastfeeding support. Using a nomogram as a graphical display of the multivariate logistic regression results might be useful for risk assessment and to prioritize targeted breastfeeding support. The nomogram might provide valuable information for healthcare professional on how to prioritize when attempting to identify women in need of additional breastfeeding support.

As for Paper IV, the women who participated may be more confident in their decision to breastfeed or more interested in breastfeeding, hence factors that are important to women who were less confident about, or interested in, breastfeeding might be missing, which could influence the results. However, we were interested in women who intended to breastfeed. Further, one could question the timing of the interviews, as some of the women had not received much information on breastfeeding from their midwife or had not attended parental class, while others had, and information about breastfeeding is known to enhance the possibility of choosing breastfeeding, before bottle or mixed feeding (158). All of the interviews, but one, were conducted via telephone. This could affect the results as we could not observe non-verbal actions. Interviews held by telephone may, on the other hand, make the respondent more confident to share sensitive information (159). To establish credibility and confirmability, the first author identified all initial themes and sub-themes, and then, all interviews were read by all authors and themes were discussed and finally agreed upon. Credibility was increased by the research group being a collaboration between medicine, midwifery and humanities, which yielded different opinions in designing the question guide as well as during the analysis process. Confirmability of the study was enhanced through the research groups' awareness of their pre-understanding of the subject.

All of the studies included in this thesis excluded women who were not able to communicate in Swedish for administrative and resource reasons, hence women who were not born in Sweden were under-represented in the respective data sets. This must be taken into account when interpreting the findings of the studies.

Conclusion and clinical implications

The main findings from this thesis suggest that the use of the hands-on approach was common among health care professionals during the first breastfeeding session, and was associated with a more negative experience of the first breastfeeding session. Further, primiparity, subjective emotional distress during pregnancy and cesarean section were independently associated with exclusive breastfeeding lasting less than two months. Depressive symptoms during pregnancy, and a postponed first breastfeeding session had a cumulative negative effect on the duration of exclusive breastfeeding at six weeks postpartum. Moreover, women described a balancing act between societal norms and personal desires when interviewed about breastfeeding during pregnancy and requested individualized breastfeeding support.

A large number of women were exposed to the hands-on approach during the first breastfeeding session. This practice may affect not only the experience of the first breastfeeding session, but also influence the duration of the breastfeeding period and should therefore be questioned and used only after careful considerations. Reporting subjective emotional distress during pregnancy and/or giving birth by cesarean section decreases the chances of a long exclusive breastfeeding duration. Notably, women who experience depressive symptoms during pregnancy were shown, in our results, to be more vulnerable to a postponed breastfeeding initiation regarding their breastfeeding duration. Some interventions, such as a postponed first breastfeeding, in many cases probably caused by separation, are changeable, if prioritized. By creating an environment, including written guidelines, where women are given the possibility to breastfeed during the first two hours after birth, the chances of a longer exclusive breastfeeding duration increase.

This thesis also shed light on the contextualized norms of breastfeeding. When interviewed during pregnancy, women describe a balancing act between societal norms and their own personal desires. Together with their wish for information, particularly about potential breastfeeding problems, and how to solve them, this should be taken into account when planning for interventions during pregnancy in order to meet women's needs for individual breastfeeding support. To promote successful breastfeeding, adequate breastfeeding support should be initiated during pregnancy, intensified right after birth, and followed up postpartum.

Future studies

While working with the studies that are part of this thesis, many new questions were raised.

The nomogram from the study reported in Paper II might give valuable information for the health care professionals on how to prioritize, when trying to identify women in need of additional breastfeeding support. As a clinical or educational tool, it can help caregivers to pay attention and target women within certain risk groups. In future interventions studies, the nomogram could be used to target women at high risk of shorter exclusive breastfeeding duration. Furthermore, in this thesis, depressive symptoms or subjective emotional distress during pregnancy has been identified as a risk factor for negative breastfeeding outcomes. Due to its sensitive nature, depressive symptoms are not always disclosed in the encounter between health care professionals and women. Today in Sweden, women and their partners are being screened for depressive symptoms with the Edinburgh Postnatal Depression Scale at six to eight weeks postpartum at the child health center. Screening for depressive symptoms during pregnancy could also be of importance and an intervention that targets women with depressive symptoms during pregnancy could give us information on how to support women in reaching their breastfeeding goals. Furthermore, conducting a follow-up study, one in which women are interviewed postpartum, may be useful in gaining a deeper understanding of women's thoughts and experiences of breastfeeding and breastfeeding support.

Sammanfattning på svenska – Summary in Swedish

De allra flesta mammor i Sverige börjar amma, men slutar ofta amma tidigare än den svenska rekommendationen: helamning under de första sex månaderna och därefter introduktion av annan mat i samband med fortsatt amning i upp till ett år eller längre. Det är många olika faktorer som påverkar amning och amningslängd. Amningsstarten, som oftast sker på sjukhus, kan påverka amningslängden då man sett att en tidig amningsstart ger en längre amningsduration. Med en tidig amningsstart menas att barnet har ammat inom sin första vakenhetsperiod. Huruvida sjukhusmiljön ger möjlighet till detta kan bero på flera faktorer. Exempelvis utförs onödiga separationer mellan mamma och barn som förlänger tiden till den första amningen. Det ingår i barnmorskans profession att ge amningsstöd och amningsrådgivning. Tidigare forskning har visat att det kan upplevas negativt när vårdpersonal, i amningsstödjande syfte, handgripligen rör kvinnans bröst och kopplar ihop det med barnets mun. I den här avhandlingen undersöktes olika faktorer som kan påverka amning samt gravida kvinnors tankar om amning och amningsstöd.

De fyra delarbetenas specifika syften var:

Delarbete I: Att undersöka förekomst och upplevelse av handgriplig amningshjälp vid det första amningstillfället samt eventuella riskfaktorer för att få handgriplig amningshjälp vid det första amningstillfället.

Delarbete II: Att undersöka eventuella riskfaktorer för att inte ha helammat under de två första månaderna postpartum.

Delarbete III: Att undersöka den sammanlagda effekten av förekomst av depressiva symtom under graviditeten och tidpunkt för första amningen i relation till helamning vid sex veckor postpartum.

Delarbete IV: Att undersöka gravida kvinnors tankar om amning och amningsstöd.

I delarbete I användes utvalda data från den populationsbaserade longitudinella studien UPPSAT. De 879 kvinnor som ingick i delarbetet besvarade frågeformulär fem dagar, sex veckor och sex månader postpartum. Resultatet visade att av de deltagande kvinnorna hade 38 % fått handgriplig amningshjälp vid det första amningstillfället. Det var vanligare att förstföderskor, kvinnor med ett body mass index över 25, kvinnor med senarelagd amningsstart

och kvinnor som högst avslutat gymnasieutbildning fick handgriplig amningshjälp vid det första amningstillfället. Att ha fått handgriplig amningshjälp vid det första amningstillfället var associerat med att ange att det första amningstillfället var en negativ upplevelse.

Även i delarbete II användes utvalda data från den populationsbaserade longitudinella studien UPPSAT. De 679 kvinnor som ingick i delarbetet besvarade frågeformulär fem dagar, sex veckor och sex månader postpartum. Av de deltagande kvinnorna hade 77 % helammat från det att barnet fötts till det var två månader. Riskfaktorer för att inte ha helammat under denna period var att vara förstföderska, ha känt sig nedstämd under graviditeten och/ eller ha fött barn med kejsarsnitt. Ett nomogram konstruerades för att lätt kunna beräkna sannolikheten för helamning i två månader eller mer.

I delarbete III användes data från den populationsbaserade longitudinella studien BASIC. De 1217 kvinnor som ingick i delarbetet besvarade webbaserade frågeformulär i graviditetsvecka 17-20, 32 samt sex veckor och sex månader postpartum. Av de deltagande kvinnorna helammade 77 % vid två månader postpartum. Kvinnor med depressiva symtom under graviditeten och med senarelagd amningsstart hade ökad risk att inte helamma vid sex veckors ålder.

I delarbete IV intervjuades elva kvinnor i sen graviditet om sina tankar kring amning. De beskrev sociala normer kring amning och funderade på sin egen, kommande amning. Omgivningens berättelser om amning, där familj och vänner delgav sina egna amningserfarenheter, ofta med fokus på amningsproblem påverkade kvinnornas tankar om amning. Inför sin egen, kommande, amning uppgav kvinnorna att de ville amma, men samtidigt uttryckte de en osäkerhet inför amningen, delvis på grund av omgivningens berättelser. Kvinnorna efterfrågade mer individanpassad information under graviditeten om amning och amningsproblem. Likaledes önskade kvinnorna individuellt anpassad amningsstöd under amningsstarten.

Slutsatser

Handgriplig amningshjälp var vanligt förekommande vid det första amningstillfället, och kvinnor som fick handgriplig amningshjälp svarade oftare att de upplevde det första amningstillfället mer negativt. Vårdpersonal bör få adekvat amningsutbildning för att kunna erbjuda ett alternativ till handgriplig amningshjälp och för att få förståelse för barnets och mammans egen förmåga att amma.

För att kunna stödja kvinnor att helamma under de första månaderna kan vissa grupper behöva uppmärksammas. Att helamma från barnets födelse och under de följande två månaderna var svårare att uppnå för förstföderskor, kvinnor som känt sig nedstämda under graviditeten och/eller kvinnor som

hade fött barn med kejsarsnitt och dessa grupper kan därför vara i behov av utökat stöd för att kunna helamma så länge som de önskar.

Förekomst av depressiva symtom under graviditeten och senarelagd amningsstart påverkade helamning negativt vid sex veckor postpartum. För kvinnor som upplever depressiva symtom under graviditeten kan det således vara extra viktigt att få möjlighet till en tidig amningsstart.

Under graviditeten har kvinnor behov av att få prata om amning och få svar på frågor relaterade till eventuella amningsproblem de funderar över. Kvinnorna i det fjärde delarbetet fick ibland höra berättelser från sin omgivning om amning som påverkade deras syn på amning och deras syn på deras förmåga att amma. Kvinnorna efterfrågade därför amningsinformation som även tar upp amningsproblem och hur man kan få hjälp och stöd om det behövs.

Fynden från de fyra delarbetena kan öka förståelsen för olika faktorer som påverkar amning och på så sätt förbättra det stöd som erbjuds ammande kvinnor.

Acknowledgements

To write this thesis at many times seemed so far away, and here I am, summoning it up! There are so many people that I would like to thank for their help and support during these years. I wish to express my sincere gratitude to:

All the women who participated in the studies and who patiently filled in the questionnaires and all the women, who, very honest and sincere, shared their thoughts about breastfeeding with me.

All the midwives, assistant nurses and other staff involved in the UPPSAT and BASIC studies. None of this would have been possible without you.

Christine Rubertsson, my main supervisor. We met for the first time when I worked as a registered nurse at the maternity ward. You later guided me through the midwifery education and introduced me into the field of research. I thank you not only for your pedagogical skills and your enthusiasm, but also for all the travels abroad we have made together; Czech Republic, Wales and, of course, Down Under – what an experience!

Alkistis Skalkidou, my co-supervisor. You are an excellent and remarkable researcher! You have been a true source of inspiration. I thank you for your patience and your pedagogical skills, especially when it comes to statistics. I will always bear the memories of your generosity and tasty Greek dinners in my mind. Efcharisto!

Sara Sylvén, my co-supervisor. Words are not enough! Thank you for always being so positive and cheerful, and helping me to focus on what is important. Thank you for all the work we have done together, all the pasta dishes you cooked for me, the yummy ginger bread dough and for answering the phone at the oddest hours.

Helena Wahlström Henriksson, Marios Georgakis, Natasa Kollia and Johan Lindström for collaborations and excellent co-authoring.

All the staff at the Department of Women's and Children's Health, which offers the most stimulating and pleasant atmosphere to work in. Thanks for having me as a PhD student and a colleague. A special thank you to all the administrative staff; Malin, Susanne, Martin, Karin, Hans, Kristine, Hanna, Marie, Gunilla and my wonderful teaching colleagues; Eva-Lotta, Gunn, Johanna, Lotta, Elin, Maria, Berit, Paola och Anna.

All the past and present fellow PhD-students; Elin, Maria, Paola, Ingrid, Rebecca, Maja, Lotta, Ann-Marie, Tommy, Caroline, Josefin, Emma, Hanna – thank you for all discussions and all the fun, our gatherings have been so important to me.

Elin Ternström – what would I have done without you? Working by your side has been a great pleasure! Thank you for always being there, answering my calls and text messages. Not only did I get the best colleague, but also a dear and close friend. Puss!

Birgitta Larsson, thank you for all the good times at different courses, conferences and travels! And finally, I do agree! “The association of PhD-students without self-esteem” is hereby abandoned.

Maria Wickström, thank you for your support throughout this journey. I really look forward to work with you at BB.

Paola Oras, thank you for your support and for all the conversations about our favorite research topic.

Uppsala University Hospital, for giving me the opportunity to do research while working in the maternity ward. A special thanks to Hanna Waernér. I also want to thank my wonderful colleagues at the maternity ward; thank you for a friendly working climate and all your support. A special thanks to Sofie Persson who is only a phone call away, day and night.

All my friends who mean the world to me! I promise to continue hosting cray fish parties on the trädäck for all eternity.

My darlings Jenny Bergström, Stina Fernqvist, Anna Koch, Anna Lagerkvist and Fia Hjärtström – thank you for always being there and for all the good times, dines, and wines.

Jenny & Jocke – you are the best friends one can possibly have. Nothing gets dull in your company and I hereby invite you to fredagsmys every week for the rest of our lives. Thank you for everything!

My family: Pappa! Storebror Johan, you are the best brother one can have and I am so thankful to be your sister. Johanna, Nilas, Liv, Kersti, Ingemar, Eric, Kajsa, Walle, Isabelle, Linda, Ethan, Anna and Dylan – thank you!

Above all, I would like to thank Jonas, the love of my life. Thank you for standing steady by my side and for your endless support. Jag älskar dig! Let us continue to live happily ever after.

Last but not least, Albin, Love and Nora, my wonderful children, the most important persons to me. May life treat you well and may the Force be with you. Mamma älskar er!

This thesis was supported by grants from Akademiska sjukhuset and the Gillbergska Foundation.

References

1. Socialstyrelsen. Statistics database for breastfeeding [Statistikdatabas för amning]. Available from: <http://www.socialstyrelsen.se/statistik/statistikdatabas/amning> [Accessed 5th April 2018].
2. Socialstyrelsen. Breastfeeding and smoking habits among parents of infants born in 2013 [Amning och föräldrars rökvanor: Barn födda 2013]. Stockholm: Socialstyrelsen; 2015. Available from: <http://www.socialstyrelsen.se/publikationer2015/2015-10-9> [Accessed 5th April 2018].
3. Palmer L, Carlsson G, Mollberg M, Nystrom M. Severe breastfeeding difficulties: existential lostness as a mother–women's lived experiences of initiating breastfeeding under severe difficulties. *Int J Qual Stud Health Well-being*. 2012;7(1):10846.
4. Thulier D, Mercer J. Variables associated with breastfeeding duration. *J Obstet Gynecol Neonatal Nurs*. 2009;38(3):259-68.
5. Hackam D, Caplan M. Necrotizing enterocolitis: pathophysiology from a historical context. *Semin Pediatr Surg*. 2018;27(1):11-8.
6. Horta BL, Loret de Mola C, Victora CG. Long-term consequences of breastfeeding on cholesterol, obesity, systolic blood pressure and type 2 diabetes: a systematic review and meta-analysis. *Acta Paediatr*. 2015;104(467):30-7.
7. Ip S, Chung M, Raman G, Chew P, Magula N, DeVine D, et al. Breastfeeding and maternal and infant health outcomes in developed countries. *Evid Rep Technol Assess (Full Rep)*. 2007;(153):1-186.
8. Vennemann MM, Bajanowski T, Brinkmann B, Jorch G, Yucesan K, Sauerland C, et al. Does breastfeeding reduce the risk of sudden infant death syndrome? *Pediatrics*. 2009;123(3):e406-10.
9. Bowatte G, Tham R, Allen KJ, Tan DJ, Lau M, Dai X, et al. Breastfeeding and childhood acute otitis media: a systematic review and meta-analysis. *Acta Paediatr*. 2015;104(467):85-95.
10. Victora CG, Bahl R, Barros AJ, Franca GV, Horton S, Krasevec J, et al. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. *Lancet*. 2016;387(10017):475-90.
11. Chowdhury R, Sinha B, Sankar MJ, Taneja S, Bhandari N, Rollins N, et al. Breastfeeding and maternal health outcomes: a systematic review and meta-analysis. *Acta Paediatr*. 2015;104(467):96-113.
12. Stuebe AM, Schwarz EB, Grewen K, Rich-Edwards JW, Michels KB, Foster EM, et al. Duration of lactation and incidence of maternal hypertension: a longitudinal cohort study. *Am J Epidemiol*. 2011;174(10):1147-58.
13. Figueiredo B, Dias CC, Brandao S, Canario C, Nunes-Costa R. Breastfeeding and postpartum depression: state of the art review. *J Pediatr (Rio J)*. 2013;89(4):332-8.
14. World Health Organization. Guideline: protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services. Geneva: World Health Organization; 2017.

15. Livsmedelsverket. Good food for babies [Spädbarn]. Available from: <http://www.livsmedelsverket.se/matvanor-halsa--miljo/kostrad-och-matvanor/barn-och-ungdomar/spadbarn/> [Accessed 5th April 2018].
16. Ekenstam C. The history of ideas of the body: discipline and character-formation in Sweden 1700–1950 [Kroppens idéhistoria: disciplinering och karaktärsdanning i Sverige 1700-1950]. Hedemora: Gidlund; 2006.
17. World Health Organization. International Code of Marketing of Breast-milk Substitutes. Geneva: World Health Organization; 1981.
18. World Health Organization. Innocenti declaration 2005 on infant and young feeding. Geneva: World Health Organization; 2005.
19. World Health Organization. Implementation guidance: protecting, promoting and supporting breastfeeding in facilities providing maternity and newborn services – the revised Baby-friendly Hospital Initiative. Geneva: World Health Organization; 2018.
20. Forster DA, McLachlan HL. Breastfeeding initiation and birth setting practices: a review of the literature. *J Midwifery Womens Health*. 2007;52(3):273-80.
21. Hofvander Y. Breastfeeding and the Baby Friendly Hospitals Initiative (BFHI): organization, response and outcome in Sweden and other countries. *Acta Paediatr*. 2005;94(8):1012-6.
22. Bjørset VK, Helle C, Hillesund ER, Øverby NC. Socio-economic status and maternal BMI are associated with duration of breast-feeding of Norwegian infants. *Public Health Nutr*. 2018:1-9.
23. Blum S, Koslowski A, Moss P. 13th International Review of Leave Policies and Research 2017. Berlin: Population Europe Secretariat, International Network on Leave Policies and Research; 2017.
24. Thomas-Jackson SC, Bentley GE, Keyton K, Reifman A, Boylan M, Hart SL. In-hospital breastfeeding and intention to return to work influence mothers' breastfeeding intentions. *J Hum Lact*. 2016;32(4):NP76-83.
25. Försäkringskassan. Social Insurance Report 2012:9 [Socialförsäkringsrapporten 2012:9]. Stockholm: 2012.
26. Flacking R, Dykes F, Ewald U. The influence of fathers' socioeconomic status and paternity leave on breastfeeding duration: a population-based cohort study. *Scand J Public Health*. 2010;38(4):337-43.
27. Magarey A, Kavian F, Scott JA, Markow K, Daniels L. Feeding mode of Australian infants in the first 12 months of life: an assessment against national breastfeeding indicators. *J Hum Lact*. 2016;32(4):NP95-104.
28. Quinlivan J, Kua S, Gibson R, McPhee A, Makrides MM. Can we identify women who initiate and then prematurely cease breastfeeding? An Australian multicentre cohort study. *Int Breastfeed J*. 2015;10:16.
29. The Swedish Pregnancy Register [Graviditetsregistret]. Annual report 2016 [Årsredovisning 2016]. 2016.
30. Amir LH, Donath S. A systematic review of maternal obesity and breastfeeding intention, initiation and duration. *BMC Pregnancy Childbirth*. 2007;7:9.
31. Ramji N, Challa S, Murphy PA, Quinlan J, Crane JMG. A comparison of breastfeeding rates by obesity class. *J Matern Fetal Neonatal Med*. 2017:1-6.
32. Preusting I, Brumley J, Odibo L, Spatz DL, Louis JM. Obesity as a predictor of delayed lactogenesis II. *J Hum Lact*. 2017;33(4):684-91.
33. Rasmussen KM, Kjolhede CL. Prepregnant overweight and obesity diminish the prolactin response to suckling in the first week postpartum. *Pediatrics*. 2004;113(5):e465-71.

34. Hauff LE, Demerath EW. Body image concerns and reduced breastfeeding duration in primiparous overweight and obese women. *Am J Hum Biol.* 2012;24(3):339-49.
35. Hauff LE, Leonard SA, Rasmussen KM. Associations of maternal obesity and psychosocial factors with breastfeeding intention, initiation, and duration. *Am J Clin Nutr.* 2014;99(3):524-34.
36. Bystrova K, Widström AM, Matthiesen AS, Ransjö-Arvidson AB, Welles-Nyström B, Wassberg C, et al. Skin-to-skin contact may reduce negative consequences of “the stress of being born”: a study on temperature in newborn infants, subjected to different ward routines in St. Petersburg. *Acta Paediatr.* 2003;92(3):320-6.
37. Christensson K, Siles C, Moreno L, Belaustequi A, De La Fuente P, Lagercrantz H, et al. Temperature, metabolic adaptation and crying in healthy full-term newborns cared for skin-to-skin or in a cot. *Acta Paediatr.* 1992;81(6-7):488-93.
38. Moore ER, Bergman N, Anderson GC, Medley N. Early skin-to-skin contact for mothers and their healthy newborn infants. *Cochrane Database Syst Rev.* 2016;11:Cd003519.
39. Bystrova K, Ivanova V, Edhborg M, Matthiesen AS, Ransjö-Arvidson AB, Mukhamedrakhimov R, et al. Early contact versus separation: effects on mother-infant interaction one year later. *Birth.* 2009;36(2):97-109.
40. Righard L, Alade MO. Effect of delivery room routines on success of first breastfeeding. *Lancet.* 1990;336(8723):1105-7.
41. Guala A, Boscardini L, Visentin R, Angellotti P, Grugni L, Barbaglia M, et al. Skin-to-skin contact in cesarean birth and duration of breastfeeding: a cohort study. *ScientificWorldJournal.* 2017;2017:1940756.
42. Lindau JF, Mastroeni S, Gaddini A, Di Lallo D, Fiori Nastro P, Patane M, et al. Determinants of exclusive breastfeeding cessation: identifying an “at risk population” for special support. *Eur J Pediatr.* 2015;174(4):533-40.
43. Kalmakoff S, Gray A, Baddock S. Predictors of supplementation for breastfed babies in a Baby-Friendly hospital. *Women Birth.* 2017.
44. Oras P, Thernström Blomqvist Y, Hedberg Nyqvist K, Gradin M, Rubertsson C, Hellström-Westas L, et al. Skin-to-skin contact is associated with earlier breastfeeding attainment in preterm infants. *Acta Paediatr.* 2016;105(7):783-9.
45. Widström AM, Ransjö-Arvidson AB, Christensson K, Matthiesen AS, Winberg J, Uvnäs-Moberg K. Gastric suction in healthy newborn infants. Effects on circulation and developing feeding behaviour. *Acta Paediatr Scand.* 1987;76(4):566-72.
46. Ransjö-Arvidson AB, Matthiesen AS, Lilja G, Nissen E, Widström AM, Uvnäs-Moberg K. Maternal analgesia during labor disturbs newborn behavior: effects on breastfeeding, temperature, and crying. *Birth.* 2001;28(1):5-12.
47. Widström AM, Lilja G, Aaltomaa-Michalias P, Dahllöf A, Lintula M, Nissen E. Newborn behaviour to locate the breast when skin-to-skin: a possible method for enabling early self-regulation. *Acta Paediatr.* 2011;100(1):79-85.
48. Matthiesen AS, Ransjö-Arvidson AB, Nissen E, Uvnäs-Moberg K. Postpartum maternal oxytocin release by newborns: effects of infant hand massage and sucking. *Birth.* 2001;28(1):13-9.
49. Colson SD, Meek JH, Hawdon JM. Optimal positions for the release of primitive neonatal reflexes stimulating breastfeeding. *Early Hum Dev.* 2008;84(7):441-9.
50. DiGirolamo AM, Grummer-Strawn LM, Fein SB. Effect of maternity-care practices on breastfeeding. *Pediatrics.* 2008;122 Suppl 2:S43-9.
51. Ekström A, Widström AM, Nissen E. Duration of breastfeeding in Swedish primiparous and multiparous women. *J Hum Lact.* 2003;19(2):172-8.

52. Murray EK, Ricketts S, Dellaport J. Hospital practices that increase breastfeeding duration: results from a population-based study. *Birth*. 2007;34(3):202-11.
53. Bystrova K, Widström AM, Matthiesen AS, Ransjö-Arvidson AB, Welles-Nystrom B, Vorontsov I, et al. Early lactation performance in primiparous and multiparous women in relation to different maternity home practices. A randomised trial in St. Petersburg. *Int Breastfeed J*. 2007;2:9.
54. Jonas K, Johansson LM, Nissen E, Ejdebäck M, Ransjö-Arvidson AB, Uvnäs-Moberg K. Effects of intrapartum oxytocin administration and epidural analgesia on the concentration of plasma oxytocin and prolactin, in response to suckling during the second day postpartum. *Breastfeed Med*. 2009;4(2):71-82.
55. Koskinen KS, Aho AL, Hannula L, Kaunonen M. Maternity hospital practices and breast feeding self-efficacy in Finnish primiparous and multiparous women during the immediate postpartum period. *Midwifery*. 2014;30(4):464-70.
56. Rudman A, Waldenström U. Critical views on postpartum care expressed by new mothers. *BMC Health Serv Res*. 2007;7:178.
57. Hong TM, Callister LC, Schwartz R. First-time mothers' views of breastfeeding support from nurses. *MCN Am J Matern Child Nurs*. 2003;28(1):10-5.
58. McInnes RJ, Chambers JA. Supporting breastfeeding mothers: qualitative synthesis. *J Adv Nurs*. 2008;62(4):407-27.
59. Waldenström U, Aarts C. Duration of breastfeeding and breastfeeding problems in relation to length of postpartum stay: a longitudinal cohort study of a national Swedish sample. *Acta Paediatr*. 2004;93(5):669-76.
60. Waldenström U, Sundelin C, Lindmark G. Early and late discharge after hospital birth: breastfeeding. *Acta Paediatr Scand*. 1987;76(5):727-32.
61. Mulford C. The Mother-Baby Assessment (MBA): an "Apgar score" for breastfeeding. *J Hum Lact*. 1992;8(2):79-82.
62. Nyqvist KH, Rubertsson C, Ewald U, Sjöden PO. Development of the Preterm Infant Breastfeeding Behavior Scale (PIBBS): a study of nurse-mother agreement. *J Hum Lact*. 1996;12(3):207-19.
63. Velandia M, Matthiesen AS, Uvnäs-Moberg K, Nissen E. Onset of vocal interaction between parents and newborns in skin-to-skin contact immediately after elective cesarean section. *Birth*. 2010;37(3):192-201.
64. Chantry CJ, Dewey KG, Peerson JM, Wagner EA, Nommsen-Rivers LA. In-hospital formula use increases early breastfeeding cessation among first-time mothers intending to exclusively breastfeed. *J Pediatr*. 2014;164(6):1339-45.e5.
65. Schafer R, Genna CW. Physiologic breastfeeding: a contemporary approach to breastfeeding initiation. *J Midwifery Womens Health*. 2015;60(5):546-53.
66. Weimers L, Svensson K, Dumas L, Navér L, Wahlberg V. Hands-on approach during breastfeeding support in a neonatal intensive care unit: a qualitative study of Swedish mothers' experiences. *Int Breastfeed J*. 2006;1:20.
67. Ingram J, Johnson D, Greenwood R. Breastfeeding in Bristol: teaching good positioning, and support from fathers and families. *Midwifery*. 2002;18(2):87-101.
68. Häggkvist AP, Brantsæter AL, Grjibovski AM, Helsing E, Meltzer HM, Haugen M. Prevalence of breast-feeding in the Norwegian Mother and Child Cohort Study and health service-related correlates of cessation of full breast-feeding. *Public Health Nutr*. 2010;13(12):2076-86.
69. Swerts M, Westhof E, Bogaerts A, Lemiengre J. Supporting breast-feeding women from the perspective of the midwife: a systematic review of the literature. *Midwifery*. 2016;37:32-40.
70. Burns E, Fenwick J, Sheehan A, Schmied V. Mining for liquid gold: midwifery language and practices associated with early breastfeeding support. *Matern Child Nutr*. 2013;9(1):57-73.

71. Ekström A, Matthiesen AS, Widström AM, Nissen E. Breastfeeding attitudes among counselling health professionals. *Scand J Public Health*. 2005;33(5):353-9.
72. Ekström A, Widström AM, Nissen E. Process-oriented training in breastfeeding alters attitudes to breastfeeding in health professionals. *Scand J Public Health*. 2005;33(6):424-31.
73. Edwards ME, Jepson RG, McInnes RJ. Breastfeeding initiation: an in-depth qualitative analysis of the perspectives of women and midwives using Social Cognitive Theory. *Midwifery*. 2018;57:8-17.
74. Blyth R, Creedy DK, Dennis CL, Moyle W, Pratt J, De Vries SM. Effect of maternal confidence on breastfeeding duration: an application of breastfeeding self-efficacy theory. *Birth*. 2002;29(4):278-84.
75. Schafer EJ, Campo S, Colaizy TT, Mulder PJ, Breheny P, Ashida S. First-time mothers' breast-feeding maintenance: role of experiences and changes in maternal perceptions. *Public Health Nutr*. 2017;20(17):3099-108.
76. Pakseresht S, Pourshaban F, Khalesi ZB. Comparing maternal breastfeeding self-efficacy during first week and sixth week postpartum. *Electron Physician*. 2017;9(2):3751-5.
77. Backström CA, Wahn EI, Ekström AC. Two sides of breastfeeding support: experiences of women and midwives. *Int Breastfeed J*. 2010;5:20.
78. Ekström A, Widström AM, Nissen E. Breastfeeding support from partners and grandmothers: perceptions of Swedish women. *Birth*. 2003;30(4):261-6.
79. Mannion CA, Hobbs AJ, McDonald SW, Tough SC. Maternal perceptions of partner support during breastfeeding. *Int Breastfeed J*. 2013;8(1):4.
80. Hackman NM, Schaefer EW, Beiler JS, Rose CM, Paul IM. Breastfeeding outcome comparison by parity. *Breastfeed Med*. 2015;10(3):156-62.
81. Thorstensson S, Andersson A, Israelsson S, Ekström A, Hertfelt Wahn E. To build a bridge between two worlds: mothers' experiences of professional support at the maternity ward. *Health Care Women Int*. 2016;37(10):1067-81.
82. Abbass-Dick J, Dennis CL. Maternal and paternal experiences and satisfaction with a co-parenting breastfeeding support intervention in Canada. *Midwifery*. 2018;56:135-41.
83. Negin J, Coffman J, Vizintin P, Raynes-Greenow C. The influence of grandmothers on breastfeeding rates: a systematic review. *BMC Pregnancy Childbirth*. 2016;16:91.
84. Bonia K, Twells L, Halfyard B, Ludlow V, Newhook LA, Murphy-Goodridge J. A qualitative study exploring factors associated with mothers' decisions to formula-feed their infants in Newfoundland and Labrador, Canada. *BMC Public Health*. 2013;13:645.
85. Nelson AM. A meta-synthesis related to infant feeding decision making. *MCN Am J Matern Child Nurs*. 2012;37(4):247-52.
86. Scott JA, Kwok YY, Synnott K, Bogue J, Amarri S, Norin E, et al. A comparison of maternal attitudes to breastfeeding in public and the association with breastfeeding duration in four European countries: results of a cohort study. *Birth*. 2015;42(1):78-85.
87. Stuebe AM, Bonuck K. What predicts intent to breastfeed exclusively? Breastfeeding knowledge, attitudes, and beliefs in a diverse urban population. *Breastfeed Med*. 2011;6(6):413-20.
88. Foss KA, Blake K. "It's natural and healthy, but I don't want to see it": Using Entertainment-Education to improve attitudes toward breastfeeding in public. *Health Commun*. 2018:1-12.

89. Hitt R, Zhuang J, Anderson J. Media presentation of breastfeeding beliefs in newspapers. *Health Commun.* 2017;1-9.
90. O'Brien M, Buikstra E, Hegney D. The influence of psychological factors on breastfeeding duration. *J Adv Nurs.* 2008;63(4):397-408.
91. Galipeau R, Dumas L, Lepage M. Perception of not having enough milk and actual milk production of first-time breastfeeding mothers: is there a difference? *Breastfeed Med.* 2017;12:210-7.
92. Gatti L. Maternal perceptions of insufficient milk supply in breastfeeding. *J Nurs Scholarsh.* 2008;40(4):355-63.
93. Kronborg H, Vaeth M. The influence of psychosocial factors on the duration of breastfeeding. *Scand J Public Health.* 2004;32(3):210-6.
94. Henshaw EJ, Fried R, Siskind E, Newhouse L, Cooper M. Breastfeeding self-efficacy, mood, and breastfeeding outcomes among primiparous women. *J Hum Lact.* 2015;31(3):511-8.
95. Andersson L, Sundström-Poromaa I, Wulff M, Aström M, Bixo M. Depression and anxiety during pregnancy and six months postpartum: a follow-up study. *Acta Obstet Gynecol Scand.* 2006;85(8):937-44.
96. Grote NK, Bridge JA, Gavin AR, Melville JL, Iyengar S, Katon WJ. A meta-analysis of depression during pregnancy and the risk of preterm birth, low birth weight, and intrauterine growth restriction. *Arch Gen Psychiatry.* 2010;67(10):1012-24.
97. Staneva A, Bogossian F, Pritchard M, Wittkowski A. The effects of maternal depression, anxiety, and perceived stress during pregnancy on preterm birth: a systematic review. *Women Birth.* 2015;28(3):179-93.
98. Grace SL, Evindar A, Stewart DE. The effect of postpartum depression on child cognitive development and behavior: a review and critical analysis of the literature. *Arch Womens Ment Health.* 2003;6(4):263-74.
99. Bogen DL, Hanusa BH, Moses-Kolko E, Wisner KL. Are maternal depression or symptom severity associated with breastfeeding intention or outcomes? *J Clin Psychiatry.* 2010;71(8):1069-78.
100. Grigoriadis S, VonderPorten EH, Mamisashvili L, Tomlinson G, Dennis CL, Koren G, et al. The impact of maternal depression during pregnancy on perinatal outcomes: a systematic review and meta-analysis. *J Clin Psychiatry.* 2013;74(4):e321-41.
101. Figueiredo B, Canario C, Field T. Breastfeeding is negatively affected by prenatal depression and reduces postpartum depression. *Psychol Med.* 2014;44(5):927-36.
102. Haga SM, Lisøy C, Drozd F, Valla L, Slinning K. A population-based study of the relationship between perinatal depressive symptoms and breastfeeding: a cross-lagged panel study. *Arch Womens Ment Health.* 2018;21(2):235-42.
103. Kroll-Desrosiers AR, Nephew BC, Babb JA, Guilarte-Walker Y, Moore Simas TA, Deligiannidis KM. Association of peripartum synthetic oxytocin administration and depressive and anxiety disorders within the first postpartum year. *Depress Anxiety.* 2017;34(2):137-46.
104. Kim S, Soeken TA, Cromer SJ, Martinez SR, Hardy LR, Strathearn L. Oxytocin and postpartum depression: delivering on what's known and what's not. *Brain Res.* 2014;1580:219-32.
105. Marin Gabriel MA, Olza Fernandez I, Malalana Martinez AM, Gonzalez Armengod C, Costarelli V, Millan Santos I, et al. Intrapartum synthetic oxytocin reduce the expression of primitive reflexes associated with breastfeeding. *Breastfeed Med.* 2015;10(4):209-13.

106. Handlin L, Jonas W, Petersson M, Ejdeback M, Ransjö-Arvidson AB, Nissen E, Unväs-Moberg K. Effects of sucking and skin-to-skin contact on maternal ACTH and cortisol levels during the second day postpartum-influence of epidural analgesia and oxytocin in the perinatal period. *Breastfeed Med.* 2009;4(4):207-20.
107. Quillin SI, Glenn LL. Interaction between feeding method and co-sleeping on maternal-newborn sleep. *J Obstet Gynecol Neonatal Nurs.* 2004;33(5):580-8.
108. Doan T, Gardiner A, Gay CL, Lee KA. Breast-feeding increases sleep duration of new parents. *J Perinat Neonatal Nurs.* 2007;21(3):200-6.
109. Blyton DM, Sullivan CE, Edwards N. Lactation is associated with an increase in slow-wave sleep in women. *J Sleep Res.* 2002;11(4):297-303.
110. Smedley BD, Syme SL (eds). *Promoting health: intervention strategies from social and behavioral research.* Washington, DC: National Academies Press; 2000.
111. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. *Psychol Rev.* 1977;84(2):191-215.
112. Dennis CL, Faux S. Development and psychometric testing of the Breastfeeding Self-Efficacy Scale. *Res Nurs Health.* 1999;22(5):399-409.
113. Aghdas K, Talat K, Sepideh B. Effect of immediate and continuous mother-infant skin-to-skin contact on breastfeeding self-efficacy of primiparous women: a randomised control trial. *Women Birth.* 2014;27(1):37-40.
114. Chan MY, Ip WY, Choi KC. The effect of a self-efficacy-based educational programme on maternal breast feeding self-efficacy, breast feeding duration and exclusive breast feeding rates: a longitudinal study. *Midwifery.* 2016;36:92-8.
115. Rosengren A, Orth-Gomer K, Wedel H, Wilhelmsen L. Stressful life events, social support, and mortality in men born in 1933. *BMJ.* 1993;307(6912):1102-5.
116. Harrell FE. *Regression modeling strategies: with applications to linear models, logistic regression, and survival analysis.* New York: Springer; 2001.
117. Rubertsson C, Börjesson K, Berglund A, Josefsson A, Sydsjö G. The Swedish validation of Edinburgh Postnatal Depression Scale (EPDS) during pregnancy. *Nord J Psychiatry.* 2011;65(6):414-8.
118. Wickberg B, Hwang CP. The Edinburgh Postnatal Depression Scale: validation on a Swedish community sample. *Acta Psychiatr Scand.* 1996;94(3):181-4.
119. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology.* 2006;3(2):77-101.
120. The World Medical Association. Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Subjects. Available from: <https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/> [Accessed 5th April 2018].
121. Lau CYK, Lok KYW, Tarrant M. Breastfeeding duration and the Theory of Planned Behavior and Breastfeeding Self-Efficacy Framework: A Systematic Review of Observational Studies. *Matern Child Health J.* 2018;22(3):327-42.
122. Fletcher D, Harris H. The implementation of the HOT program at the Royal Women's Hospital. *Breastfeed Rev.* 2000;8(1):19-23.
123. Widström AM, Thingström-Paulsson J. The position of the tongue during rooting reflexes elicited in newborn infants before the first suckle. *Acta Paediatr.* 1993;82(3):281-3.
124. Kilci H, Çoban A. The Correlation Between Breastfeeding Success in the Early Postpartum Period and the Perception of Self-Efficacy in Breastfeeding and Breast Problems in the Late Postpartum. *Breastfeed Med.* 2016;11(4):188-95.
125. Ystrom E. Breastfeeding cessation and symptoms of anxiety and depression: a longitudinal cohort study. *BMC Pregnancy Childbirth.* 2012;12:36.

126. Karlström A, Engström-Olofsson R, Norbergh KG, Sjöling M, Hildingsson I. Postoperative pain after cesarean birth affects breastfeeding and infant care. *J Obstet Gynecol Neonatal Nurs.* 2007;36(5):430-40.
127. Karlström A, Lindgren H, Hildingsson I. Maternal and infant outcome after caesarean section without recorded medical indication: findings from a Swedish case-control study. *BJOG.* 2013;120(4):479-86.
128. Rowe-Murray HJ, Fisher JR. Baby friendly hospital practices: cesarean section is a persistent barrier to early initiation of breastfeeding. *Birth.* 2002;29(2):124-31.
129. Velandia M, Uvnäs-Moberg K, Nissen E. Sex differences in newborn interaction with mother or father during skin-to-skin contact after Caesarean section. *Acta Paediatr.* 2012;101(4):360-7.
130. Dennis CL. Identifying predictors of breastfeeding self-efficacy in the immediate postpartum period. *Res Nurs Health.* 2006;29(4):256-68.
131. Henderson JJ, Dickinson JE, Evans SF, McDonald SJ, Paech MJ. Impact of intrapartum epidural analgesia on breast-feeding duration. *Aust NZ J Obstet Gynaecol.* 2003;43(5):372-7.
132. Brimdyr K, Cadwell K, Widström AM, Svensson K, Neumann M, Hart EA, et al. The association between common labor drugs and suckling when skin-to-skin during the first hour after birth. *Birth.* 2015;42(4):319-28.
133. Awi DD, Alikor EA. Barriers to timely initiation of breastfeeding among mothers of healthy full-term babies who deliver at the University of Port Harcourt Teaching Hospital. *Niger J Clin Pract.* 2006;9(1):57-64.
134. Hung KJ, Berg O. Early skin-to-skin after cesarean to improve breastfeeding. *MCN Am J Matern Child Nurs.* 2011;36(5):318-24; quiz 25-6.
135. Wiklund I, Norman M, Uvnäs-Moberg K, Ransjö-Arvidson AB, Andolf E. Epidural analgesia: breast-feeding success and related factors. *Midwifery.* 2009;25(2):e31-8.
136. Kronborg H, Foverskov E, Væth M. Breastfeeding and introduction of complementary food in Danish infants. *Scand J Public Health.* 2015;43(2):138-45.
137. Lowe NK. Self-efficacy for labor and childbirth fears in nulliparous pregnant women. *J Psychosom Obstet Gynaecol.* 2000;21(4):219-24.
138. Dias CC, Figueiredo B. Breastfeeding and depression: a systematic review of the literature. *J Affect Disord.* 2015;171:142-54.
139. Watkins S, Meltzer-Brody S, Zolnoun D, Stuebe A. Early breastfeeding experiences and postpartum depression. *Obstet Gynecol.* 2011;118(2 Pt 1):214-21.
140. Haga SM, Ulleberg P, Slinning K, Kraft P, Steen TB, Staff A. A longitudinal study of postpartum depressive symptoms: multilevel growth curve analyses of emotion regulation strategies, breastfeeding self-efficacy, and social support. *Arch Womens Ment Health.* 2012;15(3):175-84.
141. Taylor EN, Wallace LE. For shame: feminism, breastfeeding advocacy and maternal guilt. *Hypatia.* 2012;27(1):76-98.
142. Wennberg AL, Jonsson S, Zadik Janke J, Hörnsten A. Online perceptions of mothers about breastfeeding and introducing formula: qualitative study. *JMIR Public Health Surveill.* 2017;3(4):e88.
143. Chaput KH, Nettel-Aguirre A, Musto R, Adair CE, Tough SC. Breastfeeding difficulties and supports and risk of postpartum depression in a cohort of women who have given birth in Calgary: a prospective cohort study. *CMAJ Open.* 2016;4(1):E103-9.
144. Losch M, Dungy CI, Russell D, Dusdieker LB. Impact of attitudes on maternal decisions regarding infant feeding. *J Pediatr.* 1995;126(4):507-14.

145. Komninou S, Fallon V, Halford JCG, Harrold JA. Differences in the emotional and practical experiences of exclusively breastfeeding and combination feeding mothers. *Matern Child Nutr.* 2017;13(3).
146. Lee K, Vasileiou K, Barnett J. 'Lonely within the mother': An exploratory study of first-time mothers' experiences of loneliness. *J Health Psychol.* 2017;1359105317723451.
147. Holmberg KS, Peterson UM, Oscarsson MG. A two-decade perspective on mothers' experiences and feelings related to breastfeeding initiation in Sweden. *Sex Reprod Healthc.* 2014;5(3):125-30.
148. Dietrich Leurer M, Misskey E. The psychosocial and emotional experience of breastfeeding: reflections of mothers. *Glob Qual Nurs Res.* 2015;2:2333393615611654.
149. Swanson V, Hannula L, Eriksson L, Wallin MH, Strutton J. 'Both parents should care for babies': a cross-sectional, cross-cultural comparison of adolescents' breastfeeding intentions, and the influence of shared-parenting beliefs. *BMC Pregnancy Childbirth.* 2017;17(1):204.
150. Gill SL. The little things: perceptions of breastfeeding support. *J Obstet Gynecol Neonatal Nurs.* 2001;30(4):401-9.
151. Bergman P, Ahlberg G, Forsell Y, Lundberg I. Non-participation in the second wave of the PART study on mental disorder and its effects on risk estimates. *Int J Soc Psychiatry.* 2010;56(2):119-32.
152. Simkin P. Just another day in a woman's life? Part II: Nature and consistency of women's long-term memories of their first birth experiences. *Birth.* 1992;19(2):64-81.
153. Agampodi SB, Fernando S, Dharmaratne SD, Agampodi TC. Duration of exclusive breastfeeding; validity of retrospective assessment at nine months of age. *BMC Pediatr.* 2011;11:80.
154. Merten S, Dratva J, Ackermann-Liebrich U. Do baby-friendly hospitals influence breastfeeding duration on a national level? *Pediatrics.* 2005;116(5):e702-8.
155. Swedish Society of Obstetrics and Gynecology (SFOG). Child-birth and mental disease [Barnafödande och psykisk sjukdom]. Stockholm: SFOG; 2009.
156. Rubertsson C, Wickberg B, Gustavsson P, Radestad I. Depressive symptoms in early pregnancy, two months and one year postpartum-prevalence and psychosocial risk factors in a national Swedish sample. *Arch Womens Ment Health.* 2005;8(2):97-104.
157. Li J, Kendall GE, Henderson S, Downie J, Landsborough L, Oddy WH. Maternal psychosocial well-being in pregnancy and breastfeeding duration. *Acta Paediatr.* 2008;97(2):221-5.
158. Arora S, McJunkin C, Wehrer J, Kuhn P. Major factors influencing breastfeeding rates: mother's perception of father's attitude and milk supply. *Pediatrics.* 2000;106(5):E67.
159. Novick G. Is there a bias against telephone interviews in qualitative research? *Res Nurs Health.* 2008;31(4):391-8.

Acta Universitatis Upsaliensis

*Digital Comprehensive Summaries of Uppsala Dissertations
from the Faculty of Medicine 1468*

Editor: The Dean of the Faculty of Medicine

A doctoral dissertation from the Faculty of Medicine, Uppsala University, is usually a summary of a number of papers. A few copies of the complete dissertation are kept at major Swedish research libraries, while the summary alone is distributed internationally through the series Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Medicine. (Prior to January, 2005, the series was published under the title "Comprehensive Summaries of Uppsala Dissertations from the Faculty of Medicine".)

Distribution: publications.uu.se
urn:nbn:se:uu:diva-348656



ACTA
UNIVERSITATIS
UPSALIENSIS
UPPSALA
2018