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Depressive Symptoms among Mothers and Fathers in Early Parenthood

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Abstract

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Aims: The overall aims were to study depressive symptoms among mothers and fathers in early parenthood and how depressive symptoms are related to dyadic consensus (DCS), sense of coherence (SOC), perceiving of the child temperament, separation within the couple and bonding to the infant.

Methods: Study I-III was based on the BiT-study, a longitudinal project where 393 couples answered 3 questionnaires including instruments measuring DCS at one week after childbirth, depressive symptoms at 3 months and parental stress at 18 months after childbirth. Study IV was based on the UPPSAT-study, a population based cohort project, where 727 couples answered questionnaires measuring depressive symptoms at 6 weeks and 6 months after childbirth, and impaired bonding at 6 months after childbirth.

Results: In the BiT-study, 17.7% of the mothers and 8.7% of the fathers scored depressive symptoms at 3 months after childbirth, using the Edinburgh Postnatal Depression Scale (EPDS) cut-off of ≥ 10 . There was an association between depressive symptoms and less consensus (DCS), and the parents partly differed regarding which areas of their relationship they perceived that they disagreed about. Parents with depressive symptoms had a poorer SOC and perceived their child as more difficult than parents without depressive symptoms. Among the couples, 20% were separated 6-8 years after childbirth. Separation was associated with less dyadic consensus, more depressive symptoms and parental stress. In the UPPSAT-study, 15.3% of the mothers and 5.1% of the fathers scored depressive symptoms 6 weeks after childbirth, using the EPDS cut-off of ≥ 10 . Further, there was an association between impaired bonding at 6 months and the parents' depressive symptoms, as well as experience of deteriorated relationship with the spouse.

Conclusions and clinical implications: Health professionals need the knowledge that depressive symptoms are common in both mother and fathers in early parenthood. It is also important to understand how depressive symptoms are associated to dyadic consensus, SOC, separation and impaired bonding in order to optimize conditions for the whole family. This knowledge is also important for the public, so those who are pregnant and new parents as well as the society are aware that there might be problems in early parenthood as depressive symptoms.

Keywords: depressive symptoms, early parenthood, fathers, gender, health promoting, mothers

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To my family and friends all over the world ☺

*All of us from the cradle to the grave are
happiest when life is organized as a series
of excursions, long or short, from the secure
base provided by our attachment figures.*

John Bowlby

List of Papers

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

- I Kerstis, B., Engström, G., Sundquist, K., Widarsson, M., Rosenblad, A. (2012) The association between perceived relationship discord at childbirth and parental postpartum depressive symptoms: a comparison of mothers and fathers in Sweden. *Uppsala journal of medical sciences*; 117(4): 430–438.
- II Kerstis, B., Edlund, B., Engström, G., Aarts, C. (2013) Association between mothers' and fathers' depressive symptoms, sense of coherence and perception of their child's temperament in early parenthood in Sweden. *Scandinavian journal of public health*; 41(3): 233–239.
- III Kerstis, B., Berglund, A., Engström, G., Edlund, B., Sylvén, S., Aarts, C. (2014) Depressive symptoms postpartum among parents are associated with marital separation: A Swedish cohort study. *Scandinavian journal of public health*; 42(7): 660–668.
- IV Kerstis, B., Aarts, C., Tillman, C., Persson, H., Engström, G., Edlund, B., Öhrvik, J., Sylvén, S., Skalkidou, A. Association between parental depressive symptoms and impaired bonding with the infant. *Submitted*

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Contents

Prologue	11
Introduction.....	13
Early parenthood in Sweden	13
Health promotion in early parenthood.....	14
Possible risk factors in early parenthood.....	15
Depression and depressive symptoms in early parenthood	15
Relationship between spouses	17
Child temperament.....	18
Socio-economic status	18
Parental stress	18
Interactions between the parent and the infant	19
Gender perspective in early parenthood.....	19
Rationale	20
Overall and specific aims.....	22
Methods	23
Studies I–III: The BiT-study	23
Data collection and procedure	23
Demographic data.....	24
Study IV: The UPPSAT-study	25
Data collection and procedure	25
Outcomes.....	27
Depressive symptoms	27
Dyadic Consensus Subscale	28
Sense of Coherence.....	28
Infant Characteristics Questionnaire.....	29
Swedish Parenthood Stress Questionnaire.....	29
Postpartum Bonding Questionnaire.....	29
Relationship status.....	30
Data analysis	31
Studies I–III.....	31
Study IV	32
Ethical considerations	33

Results.....	34
Depressive symptoms among mothers and fathers	34
Study I	35
Depressive symptoms	36
Prevalence of perceived dyadic consensus	36
Depressive symptoms and dyadic consensus.....	36
Study II.....	38
Depressive symptoms	39
Depressive symptoms and sense of coherence	39
Depressive symptoms and infant characteristics questionnaire.....	39
Study III	41
Depressive symptoms and separation	41
Dyadic consensus and separation	41
Sense of coherence and child's temperament and separation.....	41
Parental stress and separation	42
Study IV	43
Depressive symptoms and impaired bonding	43
Mothers' impaired bonding and the association with different variables.....	44
Fathers' impaired bonding and the association with different variables.....	44
Mothers' and fathers' impaired bonding after adjusting for confounders	45
Discussion.....	46
Main findings	46
Health promotion in early parenthood.....	46
Possible risk factors in early parenthood.....	48
Gender perspective in early parenthood	49
Strengths and limitations	52
Studies I–III	53
Study IV.....	54
Conclusions.....	56
Clinical implications	57
Future studies	58
Summary in Swedish (Sammanfattning)	59
Acknowledgements.....	62
References.....	65

Abbreviations

CHC	Child Health Centres
DCS	Dyadic Consensus Subscale
EPDS	Edinburgh Postnatal Depression Scale
ICQ	Infant Characteristics Questionnaire
PBQ	Postpartum Bonding Questionnaire
PPD	Post Partum Depression
SES	Socio-Economic Status
SOC	Sense of Coherence
SPSQ	Swedish Parenthood Stress Questionnaire
WHO	World Health Organization

Prologue

During 2008–2009, I participated in the work of the government’s commission on ‘Parental Support in Sweden’ led by associate Professor Anna Sarkadi from Uppsala University [1]. I was next involved in the Barnhälsovård i Tiden study (BiT), at the Centre for Clinical Research in Västerås, which was the start of an interesting and exciting journey that ended with the present thesis. I regret that only couples who consisted of a mother and a father participated, as in our society there are other family constellations whose experience would have contributed significantly.

During the 30 years that I have worked as a nurse, paediatric nurse and district nurse, I have met children and their parents in many different contexts. I have also met new mothers and fathers who are not feeling mentally well, which made me curious about depressive symptoms in early parenthood. Early parenthood is in this thesis defined as until the child is 18 months old. As a health care professional, it is easy to turn to the mother to ask questions about the child. The mother is extremely important for the child, but the father should have the same dignity and the right to act as a parent. I hope, with this thesis, to offer insight into the period of early parenthood.

Introduction

Early parenthood has been studied thoroughly in mothers, but few studies have included both mothers' and fathers' perspectives, as done in the present thesis. There is a challenge for health care providers to involve both mothers and fathers throughout the period of early parenthood and in child health care. Fathers report feelings of invisibility during early parenthood, although both mothers and fathers express a need for the father's involvement [2]. The increased involvement of fathers is also interesting from a gender perspective and is desirable for children's development and the family situation in general [3]. This thesis has been inspired by the following perspectives in early parenthood: health promotion, possible risk factors in early parenthood, and parenting from a gender perspective. Health-promoting factors during parenthood are central for the whole family's well-being as well as for society. If a parent suffers from depressive symptoms, it affects not only her/him but also the interaction with the child. To identify possible risk factors in early parenthood is important, as good conditions in the family are essential for a young person's life and also for the parents. Considering parenting from a gender perspective is important because parenthood is an arena in which gender norms are involved. These perspectives are further elaborated in the following section.

Early parenthood in Sweden

Sweden is one of the world's leading countries in its standards of child health care and parental leave. Sweden also has the highest gender equality index of 21 high-income countries in terms of the generosity of its parental leave policy, with Finland, Greece, and Norway close behind [4]. Swedish parental insurance allows parental leave with pay for 480 days during the child's first 12 years, with 60 days reserved for each parent. In 2013, 75.2% of the total parental leave was taken by mothers and 24.8% by fathers [5].

Fathers are increasing their allocated parental leave and responsibility for the household, making these parents pioneers. However, family circumstances have changed not only for men in recent decades; women are nowadays taking greater financial responsibility [6]. These changes in parenting have implications for the provision of health care. It is still common that questions are only directed to mothers regarding the family; for example, in

health care and research. It is important to remove any obstacles to fathers' involvement in health care, because fathers often feel excluded by health care providers [7].

Health promotion in early parenthood

Health promotion in early parenthood is important because the infant is dependent on the whole family's well-being. Health is defined by the World Health Organization (WHO) as 'A state of complete physical, mental and social well-being and not only the absence of disease or infirmity' [8]. This definition is seen as utopian and was further developed. In 'Health for all' (WHO, 1977), a minimum goal for Health is that 'all people in all countries should have at least such a level of health that they are capable of working productively and of participating actively in the social life of the community in which they live' [9]. The international conference on health promotion in Ottawa described health in the Ottawa Charter (1986) as a resource for everyday life: 'Health promotion is the process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental, and social well-being, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment. Health is, therefore, seen as a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities. Therefore, health promotion is not just the responsibility of the health sector; it goes beyond healthy life-styles to well-being'. The Ottawa charter also emphasizes the importance of supportive environments [10]; these are crucial for the health of the family, especially during pregnancy and parenthood. Supportive environments protect people from threats to their health and allow the development of their capacities, confidence, and health. Such environments include the communities in which people live, and involve their work, leisure, and home [11]. Several health models describe strategic supportive environments that ensure good health. Dahlgren and Whitehead's social model of health describes the factors that influence health, including general socio-economic, cultural and environmental conditions, social and community networks, and individual lifestyle factors [12]. Those layers influence health on different levels and map the relationship between the individual, their environment and disease, trying to identify what causes health inequalities [12]. Adequate support can help parents with their parenting and can make 'family life' easier. Examples of protective factors for health that act at the international level are efforts to ensure peace and global health, activities that protect human rights, and the United Nations Convention on the Rights of the Child [13]. At the national level, supportive environments can include the regulations and laws that provide parental leave. It is also important to

establish environments for immigrants, including provision of information in different languages and opportunities to learn Swedish. At the local level, supportive environments can be provided through the school system and health care centres. Supportive environments at the individual level can be provided by family and friends [12].

Protective factors for health at the individual level are also a strong sense of coherence (SOC). Aaron Antonovsky's Salutogenesis theory implies a description of health as a continuum ranging from total ill health to total health. The theory focuses on factors that support health and well-being rather than on factors that cause diseases [14]. SOC was created as an answer to Antonovsky's question about which resources – wealth, ego strength, cultural stability, and social support – promote health and explain healthiness among people who have been exposed to extreme stress [15]. SOC is defined as viewing the world and one's interactions with the environment as manageable, comprehensive, and meaningful [16]. The SOC construct refers to factors that form the basis for successful coping with stressors [15] and supports the development of a positive subjective state of health [17]. People with low SOC are less likely to resolve or eliminate distress than are people with high SOC [18]. There is an association between postpartum depression (PPD) and poor SOC among mothers [19]. Furthermore, there is an association between strong SOC in women and positive childbearing experiences, including increased emotional health, and increased normal birth outcomes [20]. Mental illness is a growing problem in society; therefore, it is important to pay attention to both mothers' and fathers' mental health in early parenthood which is the focus in this thesis.

Possible risk factors in early parenthood

Possible risk factors in early parenthood studied in this thesis are depressive symptoms, low dyadic consensus, poor SOC, perception of the child's temperament as difficult, separation of the spouses and impaired bonding with the infant.

Depression and depressive symptoms in early parenthood

According to the WHO, depression is defined as a common mental disorder including depressed mood, loss of interest or pleasure, disturbed sleep or appetite, feelings of guilt or low self-worth, low energy, and poor concentration. The individual's ability to take care of her or his everyday responsibilities can be substantially impaired, and the problem sometimes becomes chronic or recurrent [21]. To be diagnosed with a major depressive episode, the individual must experience at least four of the following symptoms: change in appetite or weight, increased sleep and psychomotor activity;

decreased energy; feelings of worthlessness or guilt; difficulty thinking, concentrating, or making decisions; or recurrent thoughts of death or suicidal ideation, plans, or an attempt over at least two weeks [22]. Major depression incidences occur in 7.7% of women and 3.7% of men, measured in a population in a community in southern Sweden [23]. The prevalence for the adult population for depression in high-income countries is about 4-10 percent [24]. There is no significant difference in the point prevalence of depression among mothers six months after childbirth (9.1%) than in women who are not pregnant or who have had a baby in the previous 12 months (8.2%) [25]. However, onset of depression is three times higher within five weeks of childbirth [25]. The Swedish National Board of Health and Welfare recommends screening for depression in new mothers six to eight weeks after delivery [26].

The birth of a child changes the lives of individuals and the family, often increasing their happiness, but not always. In 1952, Moloney was one of the first to describe a mild depressive reaction in new mothers, which involved fatigue, despondency, tearfulness and difficulty in thinking clearly, which he labelled 'third-day depression', now called 'blues', cited in Beck & Driscoll [27]. Mood disturbances during pregnancy in women have not received as much attention as have mood disturbances after childbirth; however, the prevalence is about 10–30% according to different studies [28, 29]. PPD in mothers is defined in the psychiatric nomenclature as a major depressive episode with onset within four weeks after childbirth [22]. This has often been extended to include onset during the entire first year post-partum. WHO describes PPD as having an onset within 12 months but usually beginning within the first weeks after birth, with duration from weeks to months [30]. The prevalence of PPD in mothers is reported to be 5%–20% [31-34]. Fathers' depression in early parenthood has corresponding values of 3%–10% [35, 36] but is not as frequently investigated as mothers' depression. It is debatable whether the fathers' depression should be called PPD; in this thesis, it is hereafter called depressive symptoms in early parenthood. For mothers, the highest rates of PPD occur soon after childbirth, while fathers more often develop depressive symptoms when the child is three to six months old [37]. There is a moderate association between maternal and paternal depression in early parenthood [37]. Risk factors for PPD among mothers are a history of depression, anxiety and depression during pregnancy, post-partum blues, stressful life events, experience of a poor relationship and difficult infant temperament [31, 34].

Altered levels of hormones, such as lower levels of serum leptin, at delivery are associated with mothers PPD [38]. A recent meta-analysis of qualitative studies describes five major themes connected to mothers' experience of PPD: (1) practical life concerns, (2) crushed maternal role expectations, (3) going into hiding, (4) loss of sense of self, and (5) intense feelings of vulnerability [39]. Risk factors for paternal depressive symptoms among fathers in

early parenthood are a history of severe depression and spouse depression [40].

Depressive symptoms can affect not only the parent but also the partner, the child and the relationships in the family [41, 42]. There is a greater risk of behaviour problems for children whose mothers report symptoms of depression, both post-partum and at follow-up, than for children of women with no depressive symptoms on either occasion [43]. PPD in women can compromise the ability to become involved with the child and may even lead to abuse of the child [44]. The child's development is at risk when one parent is depressed; if both parents are depressed, the risk increases [45]. Depressive symptoms in fathers in early parenthood can be associated with later disorders in children, especially related to the behavioural development of sons [41, 46]. Fathers' involvement buffers the effect of maternal depression on infant distress and may be a protective resource for children born to teen mothers [47]. Depressed parents generally perceive their child to have more difficult temperaments than not depressed parents perceive their child [48]. Furthermore, there is a correlation between the mother's and father's sense of security and mothers and fathers depressive symptoms in early parenthood [49]. Security during the first week after childbirth can be expressed as a sense of affinity within the family and a sense of general well-being for both parents, including manageable mothers breast-feeding [50]. Low levels of quality in the relationship between spouses in early parenthood are associated with depressive symptoms for both mothers and fathers [51].

Relationship between spouses

The mental health of individuals is better among cohabiting individuals than non-cohabiting individuals [52]. Children living with only one parent are more likely to have adjustment difficulties than children living in two-parent families [53]. However, when a relationship involves frequent and overt conflict, children appear to be better off if the parents separate [53]. There is an association between having a bad dyadic relationship and mothers' and fathers' depressive symptoms in early parenthood [54-56]. Dyadic conflicts also appear to impair both parents' child-rearing practices [57]. Greater closeness between the father and child predicts a lower likelihood for separation of the couple [58]. Problems in parenting and relationship are risk factors for children suffering cognitive, social and emotional difficulties in childhood and adulthood [59]. Furthermore, inter-parental conflict is associated with children's self-blaming attributions and emotional distress [60]. In Sweden, there have been an increasing number of divorces in recent decades [61]. A Swedish study revealed that adolescents living in shared physical custody had slightly higher rates of risk behaviour than adolescents from two-parent families but significantly lower rates than their counterparts from single-parent families [62].

Child temperament

Depressed mothers and fathers generally experience their offspring as having more difficult temperamental characteristics [63]. Mothers and fathers with depressive symptoms in early parenthood perceived their children's temperaments as more difficult, for fathers the effects were significant only in boys [48]. Further is there an association between mothers experiencing the infant temperament as difficult and higher parental stress [64]. Temperament is the physiological basis for individual differences in reactivity and self-regulation, including motivation, affect, activity, and attention characteristics [65]. Reactivity is detectable within the first year and refers to responsiveness to change in the external and internal environments; it includes psychological and emotional reactions [65]. Children from the same family can have different temperaments [66]. There is a complex interplay between children's temperament and parents' behaviours [67]. Negative parenting behaviours can predict increases in such characteristics as frustration, impulsivity and low effortful control in the child, which in turn make the children more vulnerable to negative parenting [67]. Infants with easier temperaments are less vulnerable to inadequate parenting associated with maternal depression [68].

Socio-economic status

The family's conditions in early parenthood are related to socio-economic status (SES), which is a composite measure that typically incorporates economic status (measured by income), social status, work status (measured by occupation), and education [69]. SES is a sociological classification that describes the correlation between relative wealth and social status. Health and SES are related: morbidity and mortality are highest among people in lower SES groups [70]. SES factors that increase the risk of developing PPD in mothers are low education, low income, and being unemployed [71, 72]. In the present study, SES was divided into three categories: manual workers, non-manual employees, and self-employers [73]. Low SES is associated with stress [74].

Parental stress

Parenting can be associated with a number of stressors that may lead to conflicts among the parents [55]. Parental stress is described as a conflict between parental resources and the demands connected with the parental role [75]. Mothers experience more parental stress than fathers [76, 77]. Additionally mothers and fathers with a lower SOC perceive more parental stress [78]. Perceived stress is associated with paternal depressive symptoms in early parenthood [79]. There is an association between high parental stress

among mothers and fathers and parental dissatisfaction, lower family income, poor sleep by the child, and lack of support [80, 81]. Mothers with stable relationships with the child's father reports less parenting stress than those with not stable relationships [81]. Parental stress can affect the parent-child relationship negatively and reduces the well-being of parents and child [82, 83].

Interactions between the parent and the infant

The joint work at the beginning of the 1950s by the central figures in child psychology Mary Ainsworth and John Bowlby is the base of attachment theory [84]. The parents' role is to be a safe haven, a secure base from which the child can explore the world and to which the child can return and be welcomed with physical and emotional nourishment [85]. The attachment theory confirms that not only food, warmth, and material resources but also love, security and other non-material assets are critical for the infant's life [85]. Infants may respond differently even if fathers and mothers are exhibiting the same parenting behaviour, and conversely, mothers and fathers can respond differently to the same infant behaviour [86]. If the child has deficiencies in its interaction with the parents, the child has the ability to connect with other adults if there are some available [87].

Bonding reflects a process originating from the parent and directed towards the infant [88]; this should not be confused with attachment, which is reciprocal with the infant's proximity seeking [89]. Mothers with depressive symptoms sometimes fail to bond with their infants [90, 91]. A mother's lack of bonding can lead to rejection of the infant and in the severe cases can cause feelings of wanting to harm the infant [92]. During recent decades, there has been a change in the perception of the father, from being less attached to the child than the mother is, to having a care-giving role and having a closer bond to the infant [93]. However, there are few studies examining the father's bonding with the infant. A Swedish study found an association between depressive symptoms and impaired bonding in both mothers and fathers, and found that impaired bonding also related to depressive symptoms in the spouse [94].

Gender perspective in early parenthood

Connell describes sex as a biological aspect of women and men, and gender as a social construct that is adapted from the culture, influencing the way that women and men think and act [95]. Connell explained that throughout cultural history, the words 'women and men' evoke a system of understandings, implications, overtones and allusions; the meanings are not simply the biological categories of female and male but are much broader [95].

Gender equality and symbolic expressions of gender change over time [94]. Being a female or a male is not a specific role – it is a dynamic function, something that people continuously *are* [95]. The question is not about ‘being feminine or masculine’ but about which femininities or masculinities are enacted through a person’s actions [95].

According to Hirdman 2003, gender is about values, power and the creation of different norms with two basic principles in the gender system: dichotomy and hierarchy [96]. The dichotomy refers to the female and male as two different things and as opposite to each other, while in the hierarchy, the man is seen as a norm and the woman as a deviation from that norm. This gives the man a higher status and thereby more power than the woman.

After the birth of a child, mothers often do the majority of household tasks. Women experience that gender inequality in domestic work reduces relationship stability [97]. Issues of gender and the division of labour carry particularly high stakes, because children’s mental health suffers in response to parental conflict [98]. The changes when new fathers are highly engaged with their new-borns and infants benefit the whole family [99]. According to Hirdman, the democratic idea of equality is common in Sweden; however, different families implant those ideas differently [96]. A benefit of gender equality is that fathers’ involvement seems to have positive effects for the child [100, 101] including: reduced incidence of behavioural problems among boys, fewer mental health problems among girls, improved cognitive development, and less crime among children of both sexes [102]. Health care providers react differently to mothers and fathers, sometimes not welcoming fathers as much as they welcome mothers [103].

Rationale

This thesis focuses on depressive symptoms in early parenthood, highlighting the experiences of both mothers and fathers. The aims were to examine whether parents’ depressive symptoms were associated with less dyadic consensus, poor sense of coherence, perceiving their child’s temperament as difficult, separation between the spouses, and impaired bonding with the infant. These factors are important to investigate because early parenthood is an essential period in a person’s life. During this period, it is important for the parents to adapt to their changed life and to be able to give their infants the best conditions possible. Both mothers and fathers are essential for the child. Fathers sometimes feel invisible in their contact with health care providers and are less often considered in research concerning early parenthood than mothers. Depressive symptoms cause suffering for a person as well as for her/his family, and this is especially critical when the person is responsible for an infant. Research has shown that there is an association between depressive symptoms and impaired bonding in both mothers and fathers.

Furthermore, almost one-third of Swedish-born couples are separated by the time their child is 10 years old. One reason to discourage separation between the couple is that children of separated parents generally have poorer psychological well-being than children from intact families, and this can persist into adulthood. Therefore, it is necessary to study these problems, not only to be able to prevent present and future problems in the children but also to help the mothers and the fathers. Hopefully, this thesis can fill a part of the knowledge gaps that health care providers and society have and thereby strengthen the parents to give the whole family optimal conditions.

Overall and specific aims

The overall aim of this thesis is to study depressive symptoms among mothers and fathers in early parenthood. Specific aims of the individual studies are to examine:

- I the parents' level of depressive symptoms three months after childbirth, and whether mothers' and fathers' levels of perceived dyadic consensus one week after childbirth are associated with depressive symptoms:
- II whether there is an association between mothers' and fathers' depressive symptoms and sense of coherence and perception of their child's temperament:
- III whether there is an association between dyadic consensus, depressive symptoms, parental stress during early parenthood and separation of a couple six to eight years after childbirth:
and
- IV whether there is an association between depressive symptoms and parents' impaired bonding with the infant among mothers and fathers, and whether relationship problems in the couple are associated with impaired bonding with the infant.

Methods

This thesis is based on data from two population studies. Studies I–III from the BiT-study, Child Health Care Today-study (Barnhälsovård i Tiden studien) are presented together in the method section and study IV from the UPPSAT-study (UPPSala–Athens studien) is presented separately.

Studies I–III: The BiT-study

Data collection and procedure

The BiT study was a longitudinal cohort study in the county of Västmanland, about 110 km west of the Swedish capital, Stockholm, spread over an area of 345 km² with a population of about 250 000 inhabitants [104]. The participants were Swedish-speaking parents of children born between November 11, 2004 and August 17, 2006 from eight child health centres (CHCs), in the northern part of the county. During the relevant time, 521 children were born in the study region, and their parents were available to participate in the studies. All Swedish speaking new parents attending those CHCs were supposed to be asked by the CHC nurses whether they would like to participate. The author was not included in the data collection and thus had no control over this part of the study. In total, 401 mothers and 396 fathers participated (Figure 1).

Parents received oral and written information about the study from the CHC nurses, who also confirmed that their participation was voluntary. The parents were informed that it was important to complete the questionnaires individually. The baseline questionnaire was distributed to the parents by the nurse during their first visit to the CHC and was then returned by the parents in prepaid envelopes. After three weeks, a reminder was sent by post, and a second reminder was given by telephone after five weeks. New questionnaires and return envelopes were sent to the parents' homes at three and 18 months after their children's births, with reminders as at baseline. The parents were recruited consecutively, regardless of whether this was their first child or whether they were already parents. The baseline questionnaire included demographic questions concerning the parent's age, the child's sex, whether it was the first or a subsequent child, the parent's education level, and SES. SES was divided into three categories: manual workers, non-

manual employees, and self-employed [73], students and unemployed were included as manual workers. Parents who were cohabitating without being married are included in the ‘married’ group. There was a printing error in the baseline questionnaire that caused the Dyadic Consensus Scale (DCS) questions to be missing in 96 mothers’ and 91 fathers’ questionnaires. An overview of the data collection process, participants and instruments in the questionnaires is presented in Figure 1.

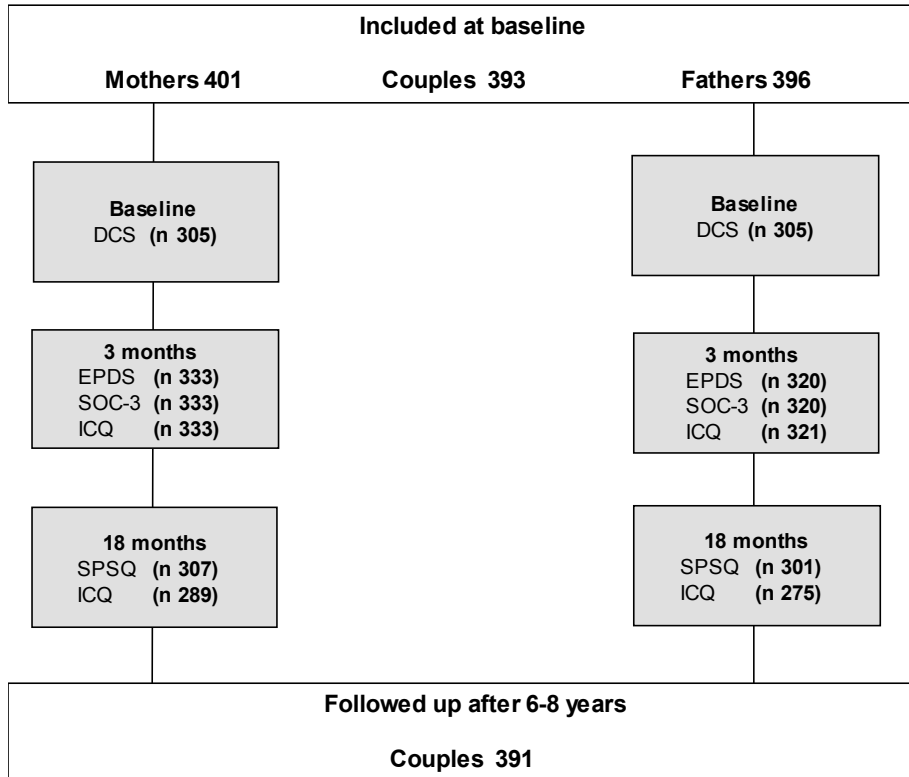


Figure 1. Study I-III flow chart of participating mothers and fathers and the instruments. DCS = Dyadic Consensus Subscale, EPDS = Edinburgh Postnatal Depression Scale, SOC = Sense of Coherence, ICQ = Infant Characteristics Questionnaire, SPSQ = Swedish Parenthood Stress Questionnaire.

Demographic data

The BiT study participants’ demographic data and socio-economic status are presented in Table 1.

Table 1. Parents' age, children's sex, first child, education, and socio-economic status (SES) in the BiT-study.

Parents age Mean (SD) (n)	Mothers	30.0 (4.9) (401)
	Fathers	32.8 (5.8) (396)
Children's Sex	Girl	48.7%
	Boy	51.3%
First child	Mothers	40% (161)
	Fathers	44% (175)
Mothers Education	Comprehensive school 9 years	6.5% (26)
	High school <12 years	60.3% (241)
	University ≥12 years	33.3% (133)
Fathers Education	Comprehensive school 9 years	6.4% (25)
	High school <12 years	74% (290)
	University ≥12 years	19.6% (77)
Mothers SES	Manual workers	58.6% (235)
	Non-manual workers	37.7% (151)
	Self-employed	3.7% (15)
Fathers SES	Manual workers	70.5% (277)
	Non-manual workers	21.9% (86)
	Self-employed	7.6% (30)

Study IV: The UPPSAT-study

Data collection and procedure

The UPPSAT-study is an ongoing longitudinal population-based cohort study in Uppsala, Uppland [105]. Uppland is a medium-sized Swedish county located 70 km north of Stockholm, with about 300 000 inhabitants. Study IV is part of the UPPSAT-study at the Department of Obstetrics and Gynaecology at the Uppsala University Hospital. All deliveries in the county as well as high-risk pregnancies from neighbouring counties are conducted

here. In the UPPSAT-study, all women giving birth between June 1, 2006 and May 29, 2007 at Uppsala University Hospital, and their partners, were asked to participate. In total, 2318 new mothers were included in the UPPSAT-study, which represents 60% of the eligible women for the whole UPPSAT-study. Exclusion criteria were: not being able to communicate adequately in Swedish, women whose personal data were kept confidential, and women with stillbirths or infants immediately admitted to the neonatal intensive care unit.

At six weeks post-partum, a questionnaire including the Edinburgh Postnatal Depressive Scale (EPDS) was sent to the mothers and fathers by post. The mothers also provided demographic data and answered questions concerning their relationship with the child's father. At six months after childbirth, the couples received questionnaires including the EPDS and the Postpartum Bonding Questionnaire (PBQ) as well as questions about the relationship and sick leave. No reminders were sent. The inclusion criteria for study IV were that both parents completely answered the EPDS at six weeks and six months, and the PBQ factor 1 at six months; in all, there were 727 couples. The demographic data are presented in Table 2. The fathers' demographic data were not available.

Table 2. Descriptive data from the 727 mothers in the UPPSAT-study.

		(n)	
Mothers age	Mean (SD)	30.7 (4.4)	(702)
Child sex	Girls	48.8%	(353)
	Boys	51.2%	(373)
Mothers First child	Yes	50.9%	(370)
	No	49.1%	(357)
Mothers Education	Comprehensive school 9 years	2.4%	(17)
	High school <12 years	36.2%	(254)
	University ≥12 years	61.4%	(431)

Outcomes

The instruments used in the studies are presented in Table 3.

Table 3. Instruments used.

Instrument	Time after childbirth	Items	Total score	Direction	Cut-off	Authors
EPDS Edinburgh Postnatal Depressive scale	BiT-study 3 months UPPSAT- study 6 weeks & 6 months	10 0-3	30	Higher points ↑ Depressive symptoms	≥10	Cox, Holden, 1987
DCS Dyadic Consensus Subscale	BiT-study Baseline	13 0-5	65	Higher points ↑ Dyadic Consensus	No	Spanier, 1976
SOC Sense of Coherence	BiT-study 3 & 18 months	3 0-2	6	Higher points ↓ KASAM	Poor KA- SAM ≥3 Strong KASAM ≤2	Antonovsky, 1987, Lundberg & Nyström- Peck, 1995, Gröhult et al. 2003
ICQ Infant Characteristics Questionnaire	BiT-study 3 & 18 months	9 1-7	63	Higher points ↑ Difficult temperament	No	Bates, 1979
SPSQ Swedish Parenthood Stress Questionnaire	BiT-study 18 months	34 1-5	170	Higher points ↑ Parental stress	No	Österberg et al. 1987
PBQ Postpartum Bonding Questionnaire	UPPSAT- study 6 months	12 0-5	60	Higher points ↑ Impaired bonding	≥12	Brockington, 2001

Depressive symptoms

EPDS is a screening instrument used primarily in health care facilities to identify PPD in women [106]. The questionnaire has been translated into several languages, including Swedish [107], and validated on mothers [108, 109] and fathers [108, 110]. The EPDS is a 10-item four-point scale, with a total score of 0–30. A higher score indicates more depressive symptoms. All the questions in the EPDS must be answered for a person's level of

depressive symptoms to be estimated. A cut-off of ≥ 10 is recommended to identify the risk of post-natal depression, and a cut-off of ≥ 12 to identify depressive illness of varying severity [106]. In the analyses of EPDS, continuous data and a cut-off of ≥ 10 were used, except that in one analysis in Study II, a cut-off score of ≥ 12 was used. The three-month questionnaire included the question ‘Were you depressed after childbirth?’ The response options were ‘No, not at all’ (1 point), ‘Yes somewhat’ (2 points), and ‘Yes, very’ (3 points). This question was dichotomized by merging answers 2 and 3 (Yes), and then the homogeneity of this question and an EPDS score ≥ 12 was assessed.

Dyadic Consensus Subscale

DCS is part of the Dyadic Adjustment Scale, a comprehensive instrument intended to assess relationship quality on four subscales: dyadic consensus, dyadic satisfaction, dyadic cohesion, and affection expression [111]. The DCS can be used alone, as in the present study, with no loss of confidence in the reliability of the measures [112]. The DCS measures the agreement between partners using 13 questions scored on a six-point Likert-type scale [111] with a total score of 65. Higher scores indicate that the mother/father thinks that she/he and her/his spouse agree, while lower scores indicate that they perceive that they are disagreeing. Cronbach’s alpha for the DCS is 0.84 [113].

Sense of Coherence

SOC is a construct that refers to personal factors that are fundamental for successfully coping with stressors [15]. A high SOC is associated with better well-being [16]. Lundberg & Nyström Peck reduced the instrument to a three-question scale to simplify the measurement of SOC [114], sometimes called SOC-3 but herein called simply SOC. The three-item instrument includes the following areas: manageability (‘Do you usually see a solution to problems that others find hopeless?’), meaningfulness (‘Do you usually feel that your daily life is a source of personal satisfaction?’), and comprehensibility (‘Do you usually feel that things that happen in your daily life are hard to understand?’). These questions are answered ‘No’ (2 points), ‘Yes, sometimes’ (1 point), or ‘Yes, usually’ (0 points); the scoring is reversed for comprehensibility. The total score for the three questions is in the range 0–6: a score of ≤ 2 indicates a strong SOC and ≥ 3 a poor SOC [115]. The kappa values for the single items are in the range 0.5–0.6 [114].

Infant Characteristics Questionnaire

Infant Characteristics Questionnaire (ICQ) measures the parental perception of an infant's temperament with 24 items [116]. The ICQ includes four subscales: fussy/difficult, unadaptable, dull, and unpredictable. In this thesis only the fussy/difficult scale was used, as has been done in another study [117]. The subscale fussy/difficult includes nine items, scored from 1 (not difficult) to 7 (very difficult) with a total score of 63. A low score indicates a less difficult temperament [116]. The parent is requested to compare the child with 'children on average' in terms of the easiness or difficulty of calming the child, the child's temper, the child's ability to amuse herself/himself, and how other parents perceive the child. The fussy/difficult subscale has proven to have good validity and reliability [116].

Swedish Parenthood Stress Questionnaire

Swedish Parenthood Stress Questionnaire (SPSQ) measuring parental stress consisting of 34 items and contents of five sub-areas: Incompetence focuses on general experiences of care-giving, feelings of incompetence in the parental role, and the difficultness of parenthood. Role Restriction is about interests and activities due to parental responsibilities. Social isolation includes social contacts outside the family. Spouse Relationship Problems describes the social experiences within the family. Health problems focus on changes in aspects of health [118]. The response options range on a Likert-type scale scoring from 1 to 5, with a total score of 170 [118]. Higher scores indicate higher stress. Cronbach's alpha is 0.90 for the total scale, and 0.71–0.84 for the subscales [119].

Postpartum Bonding Questionnaire

Postpartum Bonding Questionnaire (PBQ) is a self-rating questionnaire, initially designed to measure the mother–infant relationship [120]; it has also been used to measure the father–infant relationship [94]. The PBQ consists of 25 statements, both positive and negative. Each statement is followed by six alternative responses ranging from 'always' to 'never' [120]. A higher score indicates increasing bonding difficulties. The PBQ score is divided into four factors, each one with an individual cut-off score. Factor 1, 'Impaired bonding', includes 12 items, and scores between zero and five are given for each item, with a total maximum score of 60. The cut-off ≥ 12 has sensitivity of 0.82 for mother–infant disorders [121]. 'Impaired bonding' was in the present study defined as factor 1 with cut-off ≥ 12 . Factor 2, 'Rejection and anger', is supposed to identify severe attachment difficulties. Factor 3, 'Anxiety about care', is related to infant-focused anxiety. Factor 4, 'Incipient abuse', is supposed to identify maternal attachment disorder [120].

Relationship status

In the study IV the quality of the relationship between the spouses was measured with one question when the child was six months: 'Do you think your relationship with the child's mother/father is better/unchanged/worse after childbirth?' The answer options were dichotomized so that 'better' and 'unchanged' were compressed into one alternative.

Data analysis

SPSS versions 17, 18 and 20, and R were used for the statistical analysis, and a two-tailed p -value ≤ 0.05 was considered significant. A summary of the analyses used is presented in Table 4, and the analyses for Studies I–III and IV data will be presented in the respective chapters. Few of the variables in the studies were normally distributed. The tests performed in relation to variable scale and dependence is presented in Table 4.

Table 4. Statistical methods and tests used for different combinations of scale levels and dependent/independent data (study number within brackets).

	Paired data	Unpaired data
Categorical variables	Logistic regression (IV)	Fischer’s exact test (I – IV)
	McNemar’s test (I, II)	Pearson’s chi-square test (I)
Continuous variables	Cox proportional hazards regression (III)	Kruskal–Wallis test (II)
	Kaplan–Meier estimator (III)	Mann–Whitney U test (I)
	Spearman’s rank correlation (ρ) (I, II, IV)	
	Wilcoxon sign rank test (I, II, IV)	

Studies I–III

Depending on the internal loss of the respective questions, the number of mothers and fathers in the different analyses varied. Descriptive statistics were calculated for the demographic variables: parent’s age, child’s sex, first or subsequent child, education level and SES. The mother and the father in a couple were considered to be dependent, and all analyses involving comparisons between mothers and fathers in the couples were thus analysed using statistical methods for paired data. In the analyses of the EPDS score, a continuous variable and the cut-offs ≥ 10 and ≥ 12 were used. Observations with

missing values were excluded from the analyses for the respective instruments.

In Study I, the values for EPDS and DCS were presented as medians and quartiles (q_1 ; q_3). Values for categorical variables were given as frequencies and percentages, n and (%). McNemar's test was used to compare the occurrence of depressive symptoms between mothers and fathers. The correlations between EPDS and DCS scores were calculated with Spearman's rank correlation method (ρ). Pearson's chi-square test and Fisher's exact test were used to compare categorical variables. The Wilcoxon signed rank test was used to measure differences between mothers' and fathers' perceived levels of dyadic consensus. The Mann–Whitney U test was used to analyse differences in the perceived level of dyadic consensus between mothers and fathers with and without depressive symptoms.

In Study II, McNemar's test was used to compare the occurrence of depressive symptoms between mothers and fathers. Spearman's rank correlation method was used to assess the association between EPDS scores in mothers and fathers. Fischer's exact test was used to assess the homogeneity of depressive symptoms for different educational levels and the occurrence of depressive symptoms and SOC score. The Wilcoxon signed rank test was used to analyse the occurrence of depressive symptoms and ICQ mean scores at three and 18 months.

In Study III, the time event analysis for separation between the spouses was defined as the interval between the date of the child's birth and the date of the parent's separation, provided that the separation occurred before the follow-up March 1st, 2013. Fischer's exact test was used to assess the differences between the non-separated and separated couples. The Kaplan–Meier estimator was applied to estimate the cumulative probability of separation for the variables EPDS, DCS, SOC, ICQ, and SPSQ, which were divided into two groups: less than the mean, and equal to or greater than the mean. In the subsequent analysis, the Cox proportional hazards regression was used to examine the variable effects, after adjusting for the parents' age and educational level. Relative risk is expressed as the hazard ratio (HR) with 95% confidence interval (CI).

Study IV

Continuous variables were summarized by means and standard deviations (SD), and categorical variables by numbers and proportions. The mother and father in a couple were considered to be dependent, and all analyses involving comparisons between mothers and fathers were thus analysed using statistical methods for paired data. The Wilcoxon signed-rank test was used to analyse the PBQ mean scores between the mothers and fathers. The association between the parents' PBQ and EPDS scores was assessed using Spear-

man's rank correlation (ρ). Logistic regression was applied to assess crude and adjusted odds ratios (ORs) for binary outcomes. The crude ORs for impaired bonding were presented as forest plots. When presenting the EPDS OR scores in the forest plots, to facilitate comparison with the other variables, the scores were in units of SD.

Ethical considerations

Ethical standards for scientific work, according to the Helsinki Declaration, were followed throughout this thesis [122]. The participants were informed that their participation was voluntary and that the published material would contain no information that could reveal their identities. The parents were assured that their ordinary health care would not be affected by their decision to participate (or not) in the study. The questionnaires used in the studies contain questions that could evoke emotional responses and affect vulnerable individuals. If the parents felt a need for support, information on how to make contact with the ordinary CHCs was provided. The parents also received contact information for the research group. It is always the researcher's responsibility to weigh the benefits of studies against the disadvantages. Studies examining early parenthood are important for optimizing the conditions for parents that will benefit the children. Studies I–III were approved by the Central Ethical Review Board of Stockholm. Ethical approval for Study IV was granted by the Ethical Board in Uppsala.

Results

Depressive symptoms among mothers and fathers

Figure 2 presents the depressive symptoms for the 333 mothers and 321 fathers in the BiT study. Ten couples (3%) scored EPDS ≥ 10 for both parents. In 70 (22.2%) couples, one or both parents scored EPDS ≥ 10 . The EPDS mean score was significantly higher for the mothers than for the fathers ($p < 0.001$). The correlation between the mothers' and fathers' EPDS scores at three months was $\rho = 0.165$ ($p < 0.003$). The results from the EPDS question: 'Have you had the thought of harming yourself' is presented in Figure 3.

Figure 2 also presents the depressive symptoms among the 727 couples in the UPPSAT-study. Both parents scored EPDS ≥ 10 in 1.4% ($n = 10$) of couples at six weeks. One or both parents scored EPDS ≥ 10 in 17.6% ($n = 128$) of couples. The EPDS mean score was significantly higher for the mothers than for the fathers ($p < 0.001$) at both six weeks and six months. The correlation between the mothers' and fathers' EPDS scores at six weeks was $\rho = 0.301$ ($p < 0.001$), and at six months $\rho = 0.290$ ($p < 0.001$). The result from the EPDS question: 'Have you had the thought of harming yourself' is presented in Figure 3.

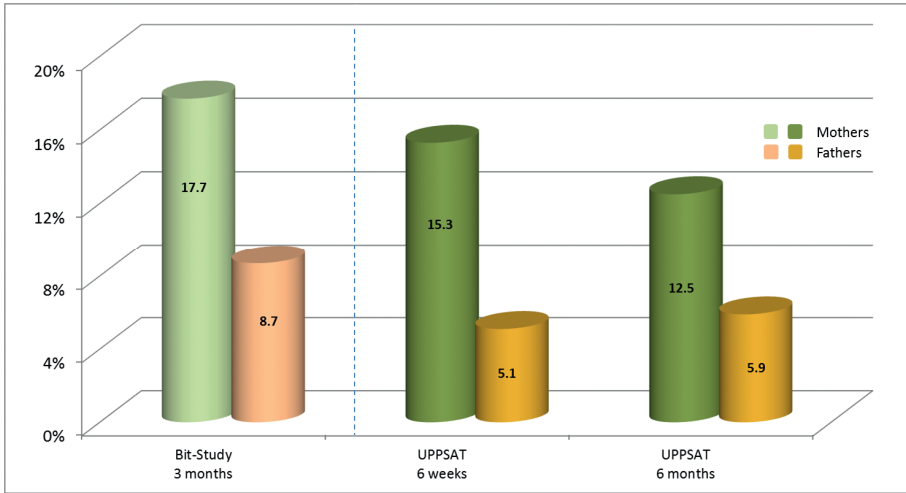


Figure 2. Percentages of mothers and fathers scoring Edinburgh Postnatal Depression Scale ≥ 10 in the BiT study's 333 mothers and 321 fathers and in the UPPSAT-study's mothers and fathers (727 couples).

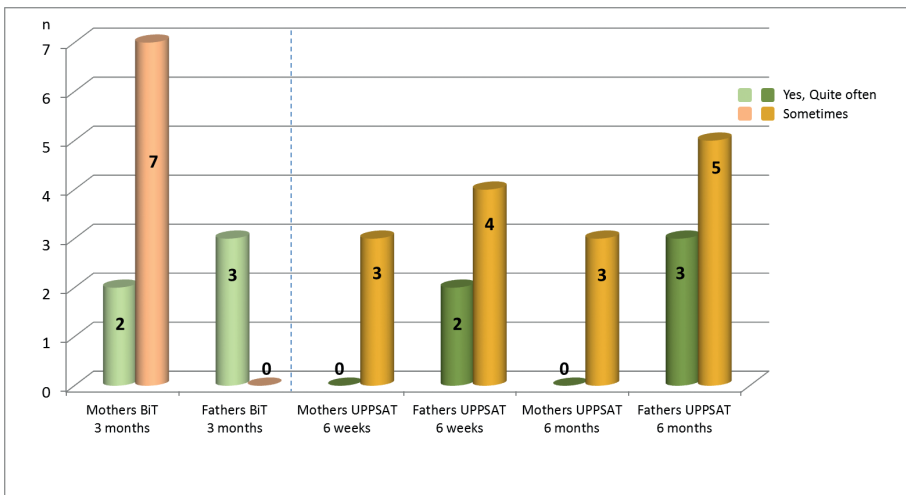


Figure 3. Numbers of mothers and fathers answering the Edinburgh Postnatal Depression Scale (EPDS) question: 'Have you had the thought of harming yourself' with answers: Yes, Quite often, or Sometimes.

Study I

The aim of Study I was to examine parents' level of depressive symptoms and whether there was an association between depressive symptoms and dyadic consensus.

Depressive symptoms

The sample used consisted of 305 couples of whom 260 (85.2%) mothers and 252 (82.6%) fathers answered all EPDS questions and thus could be evaluated for depressive symptoms three months after childbirth. Forty-three mothers (16.5%) and 22 fathers (8.7%) displayed depressive symptoms according to the EPDS cut-off of ≥ 10 . The median (q_1 ; q_3) total EPDS score was 4 (2; 7) for mothers and 3 (1; 6) for fathers. Both parents had answered all EPDS questions in 249 (81.6%) of the 305 couples. For these cases, it was possible to compare the occurrence of depressive symptoms between spouses in a couple. In total, both parents reported depressive symptoms in six (2.4%) of the couples, while neither reported depressive symptoms in 192 (77.1%) couples. The father, but not the mother, displayed depressive symptoms in 15 (6.0%) of the couples, and the mother, but not the father, in 36 (14.5%) couples. Compared with the fathers, the mothers more often displayed depressive symptoms ($p = 0.005$). The correlation between the total EPDS scores of mothers and fathers was $\rho = 0.287$ ($p < 0.001$). When measuring the mothers and fathers as individuals, there were no differences between mothers and fathers, with or without depressive symptoms regarding age, being married/cohabiting with the child's other parent, whether the child was first born, or education level.

Prevalence of perceived dyadic consensus

Regarding the separate items of the DCS one week after childbirth, the couples disagreed about the perceived level of consensus in seven of the 13 items. These were: 'Recreational activities', 'Friends', 'Aims and life goals', 'Time together', 'Household tasks', 'Leisure time interests and activities' and 'Decisions regarding career/personal development'. For all of these items, except 'Household tasks', the number of couples in which the mothers had a higher estimated level of agreement than the fathers was larger than the number of couples where it was the other way around. The correlation between the total DCS scores of mothers and fathers was $\rho = 0.595$ ($p < 0.001$).

Depressive symptoms and dyadic consensus

Mothers ($n = 43$) and fathers ($n = 22$) with depressive symptoms perceived lower levels of consensus than parents without depressive symptoms. The median (q_1 ; q_3) total DCS score was 53 (48; 56.5) for mothers with depressive symptoms, and 55 (52; 59) for mothers without depressive symptoms. The total DCS score was 49 (44.5; 53) for fathers with depressive symptoms, and 54 (51; 58) for fathers without depressive symptoms. The correlations

between the total DCS and EPDS scores were $\rho -0.253$ ($p < 0.001$) for mothers and $\rho -0.313$ ($p < 0.001$) for fathers.

Table 5 presents the difference between mothers and fathers with and without depressive symptoms and dyadic consensus. The perceived level of dyadic consensus was significantly lower for both mothers and fathers with depressive symptoms than for the parents without depressive symptoms, for the total score and for the items 'Socializing with family and friends', 'Important decisions' and 'Household tasks'. Furthermore, mothers with depressive symptoms had significantly lower dyadic consensus than the mothers without depressive symptoms and all fathers, concerning the items 'Friends' and 'Philosophy of life'. However, fathers with depressive symptoms perceived a significantly lower level of dyadic consensus than the fathers without depressive symptoms and all mothers, concerning the items 'Recreational activities', 'Time together', 'Leisure time interests and activities' and 'Decisions regarding career/personal development'. There were no significant results concerning 'Handling finances', 'Religion', 'Conventions' and 'Aims and life goals'.

Table 5. Differences between mothers and fathers with and without depressive symptoms (Edinburgh Postnatal Depressive Scale, cut-off ≥ 10 vs < 10 regarding Dyadic Consensus Scale (higher scores indicate stronger consensus)).

Item content	Mothers		P-value*	Fathers		P-value*
	With depressive symptoms	Without depressive symptoms		With depressive symptoms	Without depressive symptoms	
Recreational activities	110.90	131.28	0.065	93.14	129.69	0.009
Friends	101.07	134.30	0.003	109.23	128.15	0.182
Philosophy of life	100.20	133.33	0.002	109.36	127.06	0.229
Socializing with family and friends	106.32	132.73	0.017	98.30	128.66	0.035
Time together	115.57	130.97	0.170	83.59	129.54	0.001
Important decisions	108.77	132.84	0.032	88.59	130.13	0.004
Household tasks	108.46	132.32	0.034	84.71	129.24	0.002
Leisure time interests and activities	114.24	131.22	0.124	82.86	130.67	0.001
Decisions regarding career/personal development	114.23	131.22	0.135	99.93	127.97	0.048
Total DCS score	92.73	127.37	0.004	67.74	118.79	0.002

*Mann-Whitney *U* test

Study II

The aim of Study II was to examine whether there was an association between mothers' and fathers' depressive symptoms and SOC, and the perception of their child's temperament (ICQ). A total of 333 mothers and 320 fathers answered all EPDS questions and the SOC questionnaires three months after childbirth. The EPDS and the ICQ were answered by 289 mothers and 275 fathers.

Depressive symptoms

Three months after childbirth, 18% ($n = 59$) of the mothers and 9% ($n = 28$) of the fathers scored ≥ 10 on the EPDS ($p = 0.001$). Depressive symptoms correlated weakly between the mothers and fathers within couples ($\rho = 0.165$, $p = 0.003$). The depressive symptoms did not differ according to the parents' age, child's sex, first or not first child, SES, or mothers' educational level. Thirty-three mothers (10%) and 16 fathers (5%) scored EPDS ≥ 12 . Among these parents, three months after childbirth, 73% of the mothers and 31% of the fathers answered affirmatively the separate question: 'Were you depressed after childbirth?'

Depressive symptoms and sense of coherence

Eighty-eight percent ($n = 294$) of the mothers and 84% ($n = 278$) of the fathers recorded a strong SOC three months after childbirth. SOC correlated weakly between the mothers and fathers within couples ($\rho = 0.122$, $p = 0.027$). SOC did not differ according to the parents' age, child's sex, first or not first child, or SES. There was a difference concerning educational level and SOC among the mothers ($p = 0.009$) but not among the fathers. A higher proportion of the mothers with depressive symptoms had poor SOC than those without depressive symptoms. A similar pattern was observed in fathers (Table 6).

Table 6. Differences between mothers and fathers with and without depressive symptoms Edinburgh Postnatal Depressive Scale (EPDS), cut-off ≥ 10 vs < 10 regarding Sense of Coherence (SOC).

	Mothers % (n)			Fathers % (n)		
	With depressive symptoms	Without depressive symptoms	p-value*	With depressive symptoms	Without depressive symptoms	p-value*
Strong sense of coherence SOC ≤ 2	66% (39)	93% (255)	<0.001	50% (14)	87% (253)	<0.001
Poor sense of coherence SOC ≥ 3	34% (20)	7% (19)	<0.001	50% (14)	13% (39)	<0.001

*Fischer's exact test

Depressive symptoms and infant characteristics questionnaire

The mothers' and fathers' ICQ scores did not differ according to the parents' age, the child's sex, first or not first child, or SES. The mothers and fathers perceived their child as more difficult 18 months after childbirth than at

three months. At three and 18 months, the EPDS and ICQ scores correlated weakly in mothers and in fathers (Table 7).

Table 7. Mothers' and fathers' Infant Characteristics Questionnaire (ICQ) mean scores, and correlation between Edinburgh Postnatal Depressive Scale (EPDS) and ICQ scores.

	Mean ICQ score		Correlation between EPDS and ICQ scores	
	Mothers	Fathers	Mothers	Fathers
3 months	3.01	3.07	0.182 p<0.001**	0.252 p<0.001**
18 months	3.29	3.16	0.181 p=0.002**	0.290 p<0.001**
Difference in scores between 3 and 18 months	p<0.001*	p<0.001*		

*Wilcoxon sign rank test, **Spearman's rank correlation

Mothers scoring EPDS ≥ 10 had higher ICQ scores than mothers who did not at three months after childbirth but not at 18 months. Furthermore, fathers scoring EPDS ≥ 10 also had higher ICQ scores at three and 18 months than the fathers that did not (Table 8).

Table 8. Differences between mothers and fathers with and without depressive symptoms Edinburgh Postnatal Depressive Scale (EPDS), cut-off ≥ 10 vs < 10 in the Infant Characteristics Questionnaire (ICQ).

	Mothers mean (n)			Fathers mean (n)		
	With depressive symptoms	Without depressive symptoms	p-value*	With depressive symptoms	Without depressive symptoms	p-value*
ICQ at 3 months	3.28 (59)	2.99 (274)	<0.028	3.60 (28)	2.99 (293)	<0.001
ICQ at 3 months	3.48 (50)	3.24 (239)	<0.145	3.57 (21)	3.14 (254)	0.012

*Wilcoxon sign rank test

Study III

The aim of Study III was to examine whether there was an association between depressive symptoms, dyadic consensus, parental stress, and separation between the spouses. Among the 393 couples included one week after childbirth, one-fifth were separated 6–8 years following childbirth, with a mean time of separation of 45 months after childbirth. The risk of separation was not related to whether the child was the parents' first child or to the child's sex. Fathers with a lower educational level were more likely to be separated (Table 9). A lower educational level was also related to the time to separation (mothers $p=0.019$, fathers $p=0.020$), but the parents' age was not related to the time to separation.

Depressive symptoms and separation

Overall, 17.7% ($n=59$) of the mothers and 8.7% ($n=28$) of the fathers had an EPDS score ≥ 10 , and 9.9% ($n=33$) of the mothers and 5% ($n=16$) of the fathers had an EPDS score ≥ 12 three months after childbirth. The EPDS scores were related to separation for the mothers, fathers, and couples (Table 9). The mean EPDS score was also related to the time to separation (mothers, $p=0.031$; fathers, $p=0.001$; couples, $p=0.015$). Adjusting for age and educational level, the relationship remained significant for both mothers (HR, 1.69; 95% CI, 1.01–2.84) and fathers (HR, 1.92; 95% CI, 1.12–3.28).

Dyadic consensus and separation

Low DCS scores, one week after childbirth, were associated with increased risk of separation between the spouses for the mothers, fathers, and couples (Table 9). The mean DCS was related to the time to separation for fathers ($p=0.049$) and couples ($p=0.031$) but not for mothers. Adjusting for age and educational level, the risk of separation remained for the fathers (HR, 0.51; 95% CI, 0.28–0.92) but not for the mothers (HR, 0.65; 95% CI, 0.37–1.12).

Sense of coherence and child's temperament and separation

The couples with a low SOC, three months after childbirth, had a higher risk of separation between the spouses (Table 9) but not for the mothers' and fathers' individual scores. The mean SOC score was related to the time to separation for mothers ($p=0.034$) but not for fathers. However, after adjusting for age and educational level in the multivariate analysis, SOC was no longer related to the risk for separation. The ICQ scores, at three and 18 months after childbirth, were not related to the risk of separation or the time to separation.

Parental stress and separation

Parental stress, 18 months after childbirth, was higher in the mothers, fathers, and couples who were separated than in those who were not separated (Table 9). The mean SPSQ score was related to the time to separation for mothers ($p = 0.014$) and couples ($p = 0.013$) but not for fathers. Adjusted for age and educational level, the relationship between parental stress and separation remained for mothers (HR, 2.16; 95% CI, 1.14–4.07) but not for fathers.

Table 9. Variables** in relation to separation 6–8 years after childbirth ($n = 393$).

		Non-separated couples	Separated	
		(<i>n</i>)	(<i>n</i>)	p-value*
Mothers Education	Comprehensive school	5% (16)	13% (10)	0.034
	High school	60% (195)	61% (46)	
	University	35% (113)	26% (20)	
Fathers Education	Comprehensive school	5% (17)	11% (8)	0.011
	High school	73% (232)	78% (58)	
	University	22% (69)	11% (8)	
Fathers SES	Manual workers	68.0% (217)	81.1% (60)	0.049
	Non-manual workers	23.8% (76)	13.5% (10)	
	Self-employed	8.2% (26)	5.4% (4)	
DCS	Mothers	54.69 (229)	50.33 (52)	<0.001
Mean	Fathers	54.16 (220)	50.63 (51)	<0.001
	Couples	109.14 (207)	102.55 (47)	0.002
EPDS	Mothers	15.8% (43)	26.2% (16)	0.054
Cut off ≥ 10	Fathers	7.6% (20)	14% (8)	0.118
EPDS	Mothers	5.18 (272)	6.77 (61)	0.022
Mean	Fathers	3.85 (264)	5.05 (57)	0.041
	Couples	9.00 (259)	11.11 (56)	0.033
SOC	Mothers	1.33 (275)	1.54(61)	0.180
Mean	Fathers	1.38(274)	1.63(59)	0.130
	Couples	2.69 (272)	3.16 (58)	0.048
SPSQ	Mothers	2.38 (262)	2.65 (45)	0.002
Mean	Fathers	2.29 (254)	2.42 (47)	0.040
	Couples	4.65 (246)	5.09 (41)	0.001

*Fischer's exact test

**Measured at one week after childbirth: Dyadic Consensus Subscale (DCS): higher score indicates higher consensus. Measured at three months after childbirth: Edinburgh Postnatal Scale (EPDS): higher score indicates more depressive symptoms. Sense of coherence (SOC): higher score indicates poorer SOC. Measured at 18 months after childbirth: Swedish Parenthood Stress Questionnaire (SPSQ): higher score indicates more stress.

Study IV

The aim of Study IV (UPPSAT-study) was to examine whether the parental depressive symptoms and the parents' relationship problems were associated with impaired bonding with the infant. Maternal mean age was 31 years, and 51% of the women were primiparous; 51% of their infants were boys. Among the mothers, 62% had a university education. The fathers' demographic data were not available. Among the 727 couples, 15.3% of the mothers and 5.1% of the fathers had an EPDS score ≥ 10 .

Depressive symptoms and impaired bonding

EPDS mean scores among the 727 couples at six weeks and six months after childbirth and PBQ factor 1 at six months are presented in Table 10. EPDS mean scores were higher for mothers than for fathers. Fathers' PBQ scores were higher than mothers'. EPDS scores were higher at six weeks than at six months for both mothers and fathers. Correlations between mothers' and fathers' EPDS scores were $\rho = 0.301$ ($p < 0.001$) at six weeks, and $\rho = 0.290$ ($p < 0.001$) at six months. The correlation between mothers' and fathers' impaired bonding scores was $\rho = 0.197$ ($p < 0.001$).

Table 10. Differences between mothers and fathers for Edinburgh Postnatal Depression Scale (EPDS) and Postpartum Bonding Questionnaire (PBQ) Factor 1 scores ($n = 727$ couples).

	Mean (SD) Median		p-value*
	Mothers	Fathers	
EPDS at 6 weeks	5.35(4.11) 4.00	3.52 (3.21) 3.00	<0.001
EPDS at 6 months	4.66 (4.20) 4.00	3.18 (3.49) 2.00	<0.001
PBQ Factor 1 Impaired bonding at six months	4.11 (3.34) 3.00	4.98 (3.68) 4.00	<0.001

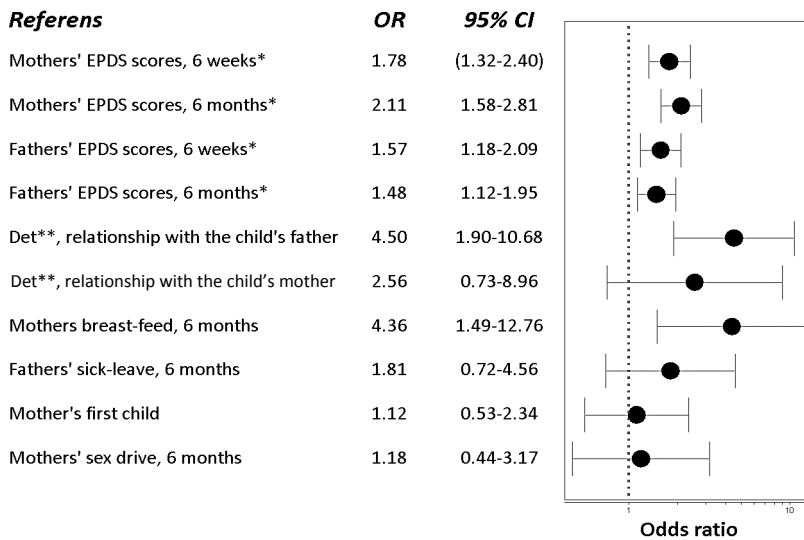
*Wilcoxon Sign rank test

Among the 589 couples in which both parents scored EPDS < 10 , 2.7% of the mothers and 4.6% of the fathers reported impaired bonding with their infant. Among the 101 couples in which only the mother had an EPDS score ≥ 10 , 6.9% of the mothers and 5.9% of the fathers recorded impaired bonding with their infant. Among the 27 couples in which only the father scored above the EPDS cut-off ≥ 10 , none of the mothers and 11.1% of the fathers reported

impaired bonding with their infant. In the small subgroup (10 couples) in which both parents scored EPDS ≥ 10 , six mothers and four fathers reported impaired bonding with their infant. Within three of those 10 couples, both the mother and the father reported impaired bonding with the infant.

Mothers' impaired bonding and the association with different variables

Figure 4 presents the mothers' impaired bonding. Mothers' impaired bonding was associated with EPDS scores at six weeks and at six months. Mothers' impaired bonding was also associated with fathers' EPDS scores at six weeks and at six months. Furthermore, there was an association between maternal impaired bonding and maternal relationship between the spouses' experience but not when the father experienced a deteriorated relationship with the mother.



*OR for the EPDS scores are per SD unit.

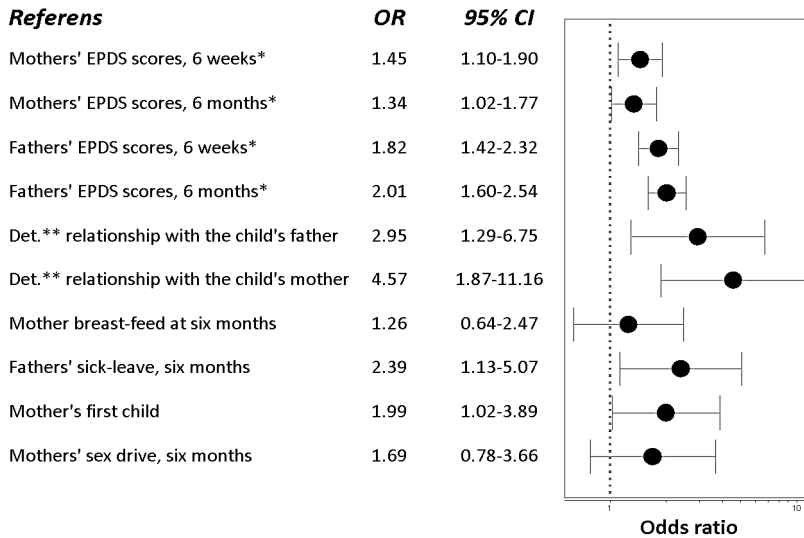
**Det. =Deteriorating

Figure 4. Crude odds ratio (OR) with 95% confidence interval (CI) for mothers' impaired bonding with their infant in relation to a series of socio-demographic and depression variables.

Fathers' impaired bonding and the association with different variables

Figure 5 presents the fathers' impaired bonding, which was associated with mothers' EPDS scores at six weeks and at six months. Paternal impaired bonding was also associated with fathers' EPDS scores at six weeks and at

six months. There was an association between fathers' impaired bonding and both mothers' deteriorating relationship experience and fathers' deteriorating relationship experience. Furthermore, there was an association between fathers' impaired bonding and whether the father was on sick-leave, as well as whether it was the mother's first child.



*OR for the EPDS scores are per SD unit.

**Det. =Deteriorating

Figure 5. Crude odds ratio (OR) with 95% confidence interval (CI) for fathers' impaired bonding with the infant in relation to a series of socio-demographic and depression variables.

Mothers' and fathers' impaired bonding after adjusting for confounders

In the multiple logistic regression models including the mothers' and fathers' impaired bonding as outcome, the EPDS score was significantly associated with impaired bonding (mothers' OR 1.14, 95% CI 1.05–1.23, fathers' OR 1.16, 95% CI 1.07–1.26), after adjustment for the possible confounders (mother's/father's experience of a deteriorated relationship, father on sick-leave, the mother being primiparous, the mother experiencing insufficient help from the father with the baby, and breast-feeding at six weeks after childbirth).

Discussion

Main findings

This thesis highlights aspects of early parenthood with focus on depressive symptoms among mothers and fathers. More mothers than fathers reported depressive symptoms, and there was a moderate correlation between depressive symptoms and less dyadic consensus. Furthermore, mothers' and fathers' depressive symptoms were associated with poor sense of coherence and perception of the child's temperament 'as more difficult'. The results also showed that conditions in early parenthood affect the separation rate between couples and those depressive symptoms are associated with the impaired bonding with the infant. The results will be discussed from three perspectives: health promotion in early parenthood, possible risk factors in early parenthood, and gender perspective in early parenthood.

Health promotion in early parenthood

Several factors influence conditions during early parenthood. Physical, mental, and social well-being is important for the whole family. If one person in the family is feeling down, it affects the others in the family. The thesis confirms that depressive symptoms in early parenthood are common among both mothers and fathers. In the BiT study, 17.7% of the mothers and 8.7% of the fathers self-reported depressive symptoms, and in the UPPSAT- study 15.3% of the mothers and 5.1% of the fathers, which was in accordance with previous studies [33, 37]. About one-fifth of the children had at least one parent with depressive symptoms in early parenthood, which is consistent with Pinheiro et al. (2006), who found that in 29% of the couples, at least one parent experienced depressive symptoms [123]. For a young child, to have one or both parents suffering from depressive symptoms can negatively affect the parent–infant interaction and the child's behavioural and vocabulary development [41, 46, 124]. It is important to look at Salutogenesis factors in early parenthood, which Antonovsky described as resources to promote health and strengthen parents in early parenthood [14].

The parents who gave an affirmative answer to the question 'Were you depressed after childbirth?' scored ≥ 12 on the EPDS more frequently than those who did not (Study II). This knowledge could be useful for child

health nurses working with new parents: by asking this single question, the nurse may elicit important information. Health care providers should give more attention to fathers, because they also need support in their parenthood [2] and can suffer from depressive symptoms [108]. The present thesis emphasizes the importance of health-promoting factors in relation to preventing mental health problems such as depressive symptoms and to creating healthy environments as support from partners, family, friends, health care, and society. It is therefore important on national and local levels to strengthen young people's self-esteem and thereby to reduce the risk of depressive symptoms, because a history of depression is a risk factor for depressive symptoms in early parenthood [125].

One way to help parents who perceive impaired bonding is to offer interactive coaching [126] and baby massage [127], which stimulates oxytocin and in turn may have a positive effect on attachment [128]. This likely has a positive effect on the father–infant relationship as well. This thesis wants to emphasize the importance of both parents' involvement in creating the children's conditions for a healthy and satisfactory life, and this is especially important for young children. The child develops during the first year a growing emotional attachment to a central parental figure, who is not necessarily the biological parent [129]. If the parents' capacity to bond is poor, children have the capacity to interact with other people [87].

Parents demand up-to-date information. Because young people today use the Internet frequently, opportunities exist to reach these parents through the Internet. Perinatal groups have previously been described as unhelpful and ineffective regarding perinatal outcomes and birthing experiences [130]. A possible explanation for this shortcoming might be the focus of care. Parental support is often based more on the health care workers' beliefs about the appropriate care rather than on the expectant parents' perceived needs [131]. Health care in the prenatal period might benefit if health care providers were of both sexes. Today, there are few male midwives and CHC nurses. For new fathers, it might be easier to connect and to feel comfortable with a person of the same sex [132].

Health care services are an important supportive environment for the family and should ensure the mothers' and fathers' involvement and commitment, and promote their commitment to their children [133]. A society can make laws and policies that facilitate the development of gender equality, such as through equitable parental leave, so that women and men have an opportunity to create their own individual solutions in parenting. At the individual level, other mechanisms may control the distribution of parental leave. The amount of parental leave taken in Sweden by fathers is increasing: in 2001, it was 14%, whereas in 2013, it was 24% [5]. This is high compared with other countries. The unequal amounts of parental leave for mothers and fathers can be attributed to differences in the distribution of their income [134]. Nowadays, many fathers take more responsibility for raising

their young children [135], which may increase the equality within couples and hopefully may reduce the conflicts between partners.

The Swedish Government has a high priority to create supportive arenas for parents. A special committee was tasked with developing a national strategy for parenting, titled *Parent support—A win for all* [1]. Those arenas can include open preschools, family centres, parent groups, or Web-based information sites. It is important that these supportive arenas are adapted to parents' specific needs, and special attention should be given to those who participate less, because they often benefit the most [136]. Perinatal care might be improved if more activities were targeted to parent groups that included non-Swedish-speaking people, fathers, young people, and single parents.

Possible risk factors in early parenthood

There was a correlation between depressive symptoms and low dyadic consensus (Study I). This was consistent with previous research, which found that depressive symptoms were correlated with lower levels of satisfaction in the couples [54]. In a study, men whose partners suffered from psychiatric disorders after childbirth recorded greater relationship dissatisfaction, and women who perceived a satisfying relationship were less likely to exhibit mental health problems during and after pregnancy [137]. It is important to strengthen the father if the mother is suffering from depressive symptoms, because the father seems to 'compensate' the mother [138]. The correlation between depressive symptoms and lower perceived dyadic consensus was stronger for the fathers than for the mothers (Study I). One explanation for this might be that women often have larger social networks than men [139]. The association between depressive symptoms and low dyadic consensus may partly be because if the mother or father feel unhappy, it is easy to blame the partner [140]. This connection seems natural in a relationship where one of the people suffers from depressive symptoms, with consequences not only for herself/himself but for the whole family [141]. There was a correlation between depressive symptoms and lower levels of consensus among mothers and fathers for the items: 'Socializing with family and friends', 'Important decisions' and 'Household'. If a person feels down, it may be easy to think that her/his spouse does not understand the issues involved. For mothers, there was also a correlation between depressive symptoms and lower levels of consensus for the items: 'Friends' and 'Philosophy of life'. One explanation for this could be that a mother with depressive symptoms requires support from the father and wants him to prioritize her and their child, as opposed to their friends. Parents with poor health report more parental stress than parents with good health [64, 142]; parents with feelings of inadequacy might develop depressive symptoms.

It is important to identify problems in early parenthood such as parental depressive symptoms and impaired bonding, as emotional deprivation in childhood is linked to behavioural problems and poor educational attainment [143]. Another potentially useful metric is the parental perception of their infant's temperament. Identifying families who perceive their children as difficult and offering them adequate support might prevent problems for these children in preschool and school. To have a child whom a parent perceives as difficult could cause frictions in the family that in the worst case could lead to abuse or/and the parents' separation. It is debatable whether separation in the couple is bad or good for the family. A Swedish study concludes that there are more risks of negative outcomes for children in shared physical custody and single-parent families than for children in two-parent families [144]. However, to live in a relation including friction, several conflicts, and maybe even abuse is not optimal for anyone.

The time period to separation was shortest if both parents reported depressive symptoms or if neither person had depressive symptoms (Study III). If the mother reported depressive symptoms, the separation occurred earlier than if the father had depressive symptoms. Even if there were few couples in which both the mother and the father had depressive symptoms, it is important to know that their separation occurred earlier. This is a signal to the health care providers to observe these families carefully and to give adequate support.

In line with other studies, depressive symptoms were associated with impaired bonding with the infant in both mothers [94, 120, 145] and fathers [94] (Study IV). This could be because the mother's and/or father's depressive symptoms may compromise their ability to bond with their infant, because depression is linked to symptoms such as sleep problems and fatigue [22]. The health professional should be aware that an impaired mother-child relationship can outlast the duration of maternal depressive symptoms [91]. The association between depressive symptoms and impaired bonding may be because a parent with depressive symptoms might not be able to have as much physical contact with her/his infant.

Gender perspective in early parenthood

Motherhood and fatherhood can be described as gendered social constructions that undergo changes during parenthood, where mothers traditionally have been responsible for the care and daily engagement, although the parents now share the chores more. The social context in which parents live has changed compared with previous generations [146]. In Sweden, to see a father out with his young child is nearly as common as it is to see a mother with her young child.

The conditions of parenthood have changed radically during recent decades. Artificial insemination and surrogate motherhood have created new ways to become a parent. Nowadays, it is not unusual for children to grow up with a single parent or with parents in same-sex relationships.

The gender norms in the family sometimes change after parenthood when the family extends to include a child. However, the mothers are still carrying out the majority of household tasks [147, 148]. Maybe this is natural when the mothers are at home to a greater extent after childbirth and there are more responsibilities and chores, compared with before childbirth. The risk is that this pattern remains in the family when the father has parental leave or when both parents are working.

In Study I, the mothers estimated that the couple had more dyadic consensus than the fathers did for all items in DCS, except for 'Household tasks'. An explanation may be that mothers actually expect to do more chores than fathers [149]. Concerning 'Household tasks', it may be that the father thinks that they have consensus and that he does his share but the mother does not agree. An interesting finding was that the parents did not perceive that they disagreed about the issue 'Handling finances', while previous research has concluded that disagreements about finances are a major source of relationship conflicts [150]. It is important that couples can talk to each other about finances, as among women, gender inequality reduces the relationship stability [97]. Many fathers have no role models for being a good father with changing requirements in the commitment [76, 151]. They also describe the difficulties of navigating the female-dominated world around childbirth. The mothers might take the role as gate-keeper for the father's access to the child [152]; sometimes it seems as women want to maintain their control and power over the family and home.

Furthermore, in Study I, there was a correlation between higher levels of consensus among mothers and fathers for the items: 'Socializing with family and friends', 'Important decisions', and 'Household tasks' and depressive symptoms. If a person suffers from depressive symptoms, it might be because her/his spouse does not understand the burden that she/he has. For mothers, there was a correlation between depressive symptoms and lower levels of consensus for the items: 'Friends' and 'Philosophy of life'. One explanation for this could be that a mother with depressive symptoms requires support from the father and wants him to prioritize her and their child, rather than their friends. For the fathers, there was a correlation between depressive symptoms and lower levels of consensus for the items: 'Recreational activities', 'Time together', 'Leisure time interests and activities', 'Decisions regarding career/personal development' and depressive symptoms. One could assume that some fathers feel that their spouses do not spend enough time with them. Another reason may be that the father misses time for himself after the childbirth. Some new parents may not have a clear idea of what it means to be a parent and may need support to assume their

new role [78, 151] they might miss family and friends to share their experiences with of different reason as recently moved or that they are immigrants [2]. If dyadic consensus had been investigated after several weeks/months, the parents might have given different responses.

In all studies, the fathers reported less depressive symptoms than the mothers did. Fathers with depressive symptoms might have more difficulty expressing emotions and might seek health care less often than mothers for depressive symptoms and thus might not be noticed by health care providers.

After separation, families in middle and higher socio-economic groups more often let the children live part-time with both parents than families from lower socio-economic groups do, which gives the child more access to both parents [153]. In Study III, less dyadic consensus and depressive symptoms and more parental stress were associated with a higher risk of separation, possibly because less dyadic consensus and parental stress can lead to more friction between the parents. Separation is a life-crisis event that can affect the family's psychological health [52, 154]. However, children appear to be better off if the parents separate when a relationship involves frequent and overt conflicts [53]. In Western countries, many women have the economic capacity and social status to divorce, in contrast to countries where the women are more dependent on husbands and family opinions. This is related to women's and men's conditions in the world and the relationships between women and men, their access to resources, their activities and how all these things relate to each other [155]. The parents with a higher educational level had a lower risk of separation in accordance with a Swedish national report [156]. A possible explanation is that parents with a higher educational level have fewer economic problems and have their first child later in life, which might be beneficial to the relationship. More education is also a strong predictor of both better physical and mental health, and couples with higher levels of education tend to share housework and child-care duties more equally [157]. Equitable sharing is also associated with a lower risk of separation by the couple [158].

In Study IV, the fathers scored significantly higher on the bonding subscales than the mothers, which is in accordance with another study [94]. One explanation could be that the fathers spend less time at home than the mothers when the infant is young. In Sweden, fathers take nearly one-fourth of their parental leave days, but usually they do not take the leave during the child's first months of life [159]. This means that the father has not been at home to the same extent as the mother during the first six months after childbirth.

In an international context, Sweden is often regarded as a leading country in child health, and gender equality. Nevertheless, it is still common that only mothers are consulted about the child in antenatal clinics, and CHCs. Research is also in general based only on mothers' data concerning children's temperament, health, parenting, and so on. If child care, medical re-

search and treatment developments are seriously intended to apply to both parents, it is important to highlight the fathers' as well as the mothers' perspectives on children and parenting.

Society's prejudices are strongly entrenched. For instance, if a woman returns to work only weeks after giving birth, many people raise eyebrows, which is not the case when the man does the same. Even though Sweden is one of the world's leaders in gender equality, Swedish parents have not yet taken full advantage of the social benefits. Still, there is some inequality, as mothers take most of the responsibility for the family and children [160]. A society can make laws and policies that facilitate the development of gender equality, such as through equitable parental leave, so that women and men have opportunities to create individual solutions for themselves in parenting. At the individual level, other mechanisms may control the distribution of parental leave. The amount of fathers' parental leave is higher than in other countries, but parental leave is still not equally shared, which could be explained by biological causes, as in many families, it is considered to be natural that the mother should stay home during the time after delivery, partially explained by the mother's breast-feeding. Another gauge for equality in the family is the amount of 'taking care of a sick child', which has not changed substantially during recent decades [5]. The unequal amount of parental leave for mothers and fathers can be attributed to differences in the distribution of their income [134], but it is still surprising that the division of labour in families is so conservative.

Strengths and limitations

The strengths and limitations of these studies will be discussed in general and then separately for Studies I–III and Study IV. The key strength was that the studies were longitudinal follow-up studies and that both mothers and fathers participated. There have been several studies of mothers in early parenthood but fewer studies of fathers. One limitation of these studies was that only Swedish-speaking parents were included, with the possible consequence that those most needing support were not included [161].

Unfortunately, in the present thesis, nothing is known about depressive episodes and/or anti-depressive treatment before childbirth or by the time of childbirth. Furthermore, there was no clinical assessment of depression among the parents, which is regrettable. However, two advantages of screening with EPDS are that it requires only five minutes to complete and has a simple scoring system [106]. Another reason to use a screening instrument is that it can be difficult to identify depressive symptoms, even with knowledge and training, without a universal screening method [162]. Furthermore, the professional should be aware of the significant suicidality that is likely to be

present when answering ‘Yes, Quite often’ to question 10 of the EPDS [163].

The validity in the present thesis is satisfactory because the questionnaire instruments –EPDS, DCS, ICQ, SOC, and PBQ– are valid instruments and commonly used with parents in early parenthood [106, 111, 114-116, 121]. There was no control of whether the couples influenced each other when filling in the questionnaires, even though the intention was, and the instructions emphasized, that the parents should fill them in separately; this is a limitation of self-scored instruments. The thesis reliability, the consistency of an instrument measuring what it is intended for [164], is also satisfactory because the findings are congruent with other studies. Depressive symptoms and impaired bonding, for example, were also found in other studies in both mothers and fathers [94], which strengthen the generalizability of the findings in similar settings.

One limitation in the studies was that the author was not included in the data collection. However, the author has taken part in the input of data, performed most of the statistical analyses, with help from statisticians, and has been the main drafter of all manuscripts. It can be a limitation not being included in the planning and thus having control of the data collection. On the other hand, not being involved can be a strength: it offers the opportunity to view the study data with clearer eyes.

Studies I–III

To obtain a broad distribution, parents from eight CHCs participated in this study. One limitation was that there were few participants in subgroups such as separated mothers and fathers with depressive symptoms. Furthermore, there was a printing error in the baseline questionnaire, and 96 mothers’ and 91 fathers’ questionnaires were missing the DCS questions. However, those questionnaires were distributed among all participating CHCs, and parents with complete questionnaires came from all the communities.

A possible limitation was that dyadic consensus was assessed one week after childbirth; i.e., in a period that included an overwhelming experience for most couples. In the BiT study the EPDS was completed on only one occasion, so changes over time could not be followed. However, questions of how depressive symptoms were related to dyadic consensus and the parents’ perceptions of their child’s temperament and the SOC score were examined.

One possible misclassification was the use of an EPDS cut-off of ≥ 10 , which increases the rate of false-positive PPD results compared with a cut-off of ≥ 12 . The latter gives few false-positive results, but its sensitivity is far from adequate [165], and a considerable number of cases will be missed [166]. However, when the scale is used in primary health care, a cut-off of ≥ 10 is recommended for routine examinations of new mothers [106, 167]

and has been used in several other Swedish studies [94, 168, 169]. One study describes ≥ 13 as an optimal cut-off [170]. However, another study indicates that within the EPDS interval of 9–11, reports of stress, spouse problems, and perceived difficult children increase to high levels [119]. The EPDS has been validated for women in at least 25 countries but only occasionally for men [108, 110, 171]. The validation describes the EPDS as a valid instrument for screening for major depression in new fathers [108].

In Study II, not using the complete SOC scale could have been a limitation, but SOC-3 captures the essence of the original scale with satisfactory reliability, and its use might reduce the drop-out rate among parents who may be too tired to complete the entire questionnaire [114].

Using the ICQ could be problematic when others might experience the child differently. There are recommendations to use an outsider to assess whether the child is difficult or not [116]. It might not be the child that is ‘difficult’ but instead the parent who has the problem. However, if the parent considers their child is difficult, the family might be a candidate for more support regardless of the source of the difficulty.

A limitation in Study III was that the parents’ depressive status was not investigated when they separated. It could be that depressive symptoms make it hard to live with a person, especially when there is a young child to take care of. The definition of separated based on the parents’ addresses is debatable because it cannot be guaranteed that a couple has separated based only on their addresses. Furthermore, the results might have been different if the children of the separated parents had been at the same age; the BiT study included parents with children born from the end of 2004 to the middle of 2006, and eventual separation was measured in 2013 for all couples.

The generalizability in the BiT study could be questioned when the sample is from the countryside and from areas with less than 15 000 residents, and the sample was not randomized. However, the results should be generalizable to other parts of Sweden with about the same population.

Study IV

Study IV’s strength is that it is a longitudinal cohort study with many couples ($n=727$), which allows to determine depressive symptoms and impaired bonding of both parents, and not just in the individuals. There are several studies about mothers’ bonding with their children, but fathers are seldom included. A depressed parent might feel more insecure [172], which can lead to underestimation of her/his parenting skills and recording lower bonding than non-depressed parents do. The lower prevalence of depressive symptoms among mothers and fathers compared with other studies [31, 32, 37, 108] might be explained because the survey required effort from both parents to complete and send back the questionnaires at six weeks and six months after childbirth. It might be that those who were severely depressed

did not fill in the questionnaires to the same extent. In the whole of the UPPSAT-study cohort, 18% of the mothers and 6.9% of the fathers scored EPDS ≥ 10 at six weeks after childbirth. Another limitation is the scarce fathers' background characteristics since the UPPSAT-study was originally designed to investigate new mothers.

Conclusions

Depressive symptoms among parents have consequences for the health of the whole family. Therefore, it is important that health care providers identify families who suffer from depressive symptoms, especially in early parenthood. Living in a relationship with less dyadic consensus can lead to friction and even separation. If health care providers can identify risk factors such as depressive symptoms, lack of dyadic consensus, and/or parental stress, it improves the ability to support the parents during a tough period of life. This will benefit the parents' own health, and benefit the children's current and future health. Hopefully this can help to preserve the parents' relationship. Maternal and paternal depressive symptoms are often related to each other, which makes it even more important to screen both mothers and fathers. It is important to include the fathers and to give them the right to be a full, equal parent in the health care system. This thesis confirms that both mothers' and fathers' perspectives are important and that they should be treated as equal parents with the same responsibility and dignity.

The conclusions from the present studies are as follows.

- Both mothers and fathers can experience depressive symptoms in early parenthood (Study I).
- Depressive symptoms were associated with less dyadic consensus. Mothers and fathers differed slightly in the areas of their relationships in which they perceived themselves to agree with their partner (Study I).
- Mothers and fathers with depressive symptoms more frequently exhibited poor SOC and perceived their child's temperament as more difficult than those without depressive symptoms (Study II).
- There was an association between depressive symptoms, less dyadic consensus and parental stress in early parenthood and increased risk of separation 6–8 years after childbirth (Study III).

- Depressive symptoms in mothers and fathers at six weeks after childbirth were associated with impaired bonding with the infant six months after childbirth (Study IV).
- It is important to screen for depressive symptoms in mothers in early parenthood. To screen fathers should also be routine at least if the partner records depressive symptom. There is an association between parents' depressive symptoms and; less dyadic consensus, poorer sense of coherence, perception of the child's temperament as more difficult than children in average, separation of the spouses, and impaired bonding with the infant (Studies I–IV).

Clinical implications

A challenge for health care providers is to involve both mothers and fathers through communication and encouragement. Therefore, the present thesis highlights both mothers' and fathers' experiences, focusing on their mental health in early parenthood. The prevalence of depressive symptoms in early parenthood is about 10–20% among women and 10% among men. Health care providers should be aware of the high level of depressive symptoms in early parenthood, to minimize harmful effects on the individuals, their relationships, and their children. Health care providers should be aware that mothers and fathers may have different views on dyadic consensus, that less dyadic consensus can be related to depressive symptoms, and that parents sometimes believe that their spouses are disagreeing with them, while in reality, they are not. This knowledge is important for society, maternal and child health care, and for family counsellors to be able to plan and give parents adequate support. To include and engage fathers is in line with political voices that are raised to make fathers more involved in their children, as this provides a favourable development for the child and an improved situation for the whole family.

Future studies

This thesis contributes to the knowledge about mothers' and fathers' conditions in early parenthood with focus on depressive symptoms. However, further research is needed to examine several aspects of parenthood, especially the father's mental health in early parenthood. It would be of interest to see whether paternal depressive symptoms in early parenthood affect the child's development in later life. A Swedish validation of the EPDS on men describes EPDS as a valid instrument for measuring major depression in new fathers. However, a broader understanding of father's mental health in early parenthood is needed.

Furthermore, possible confounders such as alcohol misuse, personalities/temperaments/vulnerabilities, or social support, are not discussed, as they were not investigated. These would make interesting topics for future studies. It would also be of interest to investigate who initiates a separation and for how long the couple has struggled with difficulties before they separate.

It is also important that researchers should collect knowledge about other parents, such as newly arrived and single parents who may be bypassed because of language deficiencies or other reasons. It might be that those who are in most need of support are excluded from research.

To investigate which community interventions could strengthen parents in early parenthood is also of interest.

Physical activity is mentioned as one of the best preventive activities for depressive symptoms and also for relieving depressive symptoms. Therefore, it would be important to implement and evaluate physical activity including dance or other activities that may reduce depressive symptoms.

The studies in this thesis have a quantitative design; qualitative studies can probably consider other aspects of parents' conditions in early parenthood in more depth.

Summary in Swedish (Sammanfattning)

Att bli förälder är en av livets stora händelser. Oftast upplever de nyblivna föräldrarna ett barns födelse positivt, men inte alltid. Ett flertal internationella och nationella studier har påvisat depressiva symtom hos mammor efter barnets födelse. Studier om pappors depressiva symtom är inte lika frekvent förekommande. Föräldrars mentala hälsa är viktig för personen själv men påverkar också relationen till den andra föräldern och barnets levnadsvillkor med risk för störningar i barnets beteende och utveckling.

Det övergripande syftet med avhandlingen var att beskriva föräldraskapet under barnets första 18 månader med fokus på mammor och pappors depressiva symtom. Dessutom beskrevs föräldrarnas depressiva symtom samband med: föräldrarnas enighet i förhållandet, 'känsla av sammanhang', upplevelse av barnets temperament, separation mellan föräldrarna samt bonding till barnet. Inget adekvat svenskt ord för bonding har återfunnits då anknytning är en parallell process mellan barn och förälder, medan engelskans bonding rör föräldrarnas anknytning till barnet.

Studie I-III baserades på BiT-studien 'Barnhälsovård i Tiden', där 401 mammor och 396 pappor i norra Västmanland, besvarade enkäter en vecka, tre månader samt 18 månader efter barnets födelse (2004 - 2006). Studie IV baserades på UPPSAT-projektet, där 727 föräldrapar i Uppland, besvarade enkäter sex veckor samt sex månader efter barnets födelse (2006 - 2007).

I studierna skattades depressiva symtom med Edinburgh Postnatal Depression Scale (EPDS), ett internationellt och nationellt väl använt instrument för att finna depressiva symtom efter barnets födelse. Föräldrarna uppmanades att värdera tio påståenden utifrån hur de hade känt sig de senaste sju dagarna så som: 'Rädd och orolig utan egentlig anledning', 'Ledsen eller nere', 'Så olycklig att jag har haft svårt att sova', 'Tankar på att göra mig själv illa har förekommit'. I avhandlingens studier har depressiva symtom definierats som EPDS ≥ 10 .

I studie IV besvarade 727 par EPDS vid sex veckor och sex månader efter barnets födelse samt Postpartum Bonding Questionnaire (PBQ) sex månader efter barnets födelse för att mäta föräldrarnas bonding till barnet. Delskala ett i PBQ innehåller 12 påståenden, så som: 'Barnet stressar upp mig', 'Jag vill inte ha med mitt barn att göra', 'Jag önskar att mitt barn på något sätt skulle försvinna'. Försämrade bonding definierades som PBQ delskala ett ≥ 12 .

I BiT-studien skattade 18% av mammorna och 9% av papporna depressiva symptom. I 3% av de 321 paren skattade både mamman och pappan depressiva symptom och i 22% av paren, skattade någon av föräldrarna depressiva symptom. I UPPSAT-projektet skattade 15% av mammorna och 5% av papporna depressiva symptom. I 1,5% av de 727 paren, skattade både mamman och pappan depressiva symptom, och i 17,5% av paren någon av föräldrarna depressiva symptom. Detta indikerar att nästan vart femte barn hade åtminstone en förälder som skattade depressiva symptom.

I studie ett påvisades samband mellan depressiva symptom och föräldrarnas enighet i förhållandet. Enighet i förhållandet skattades utifrån 13 påståenden så som: ekonomi, rekreation, vänner, hushållsuppgifter och fritid. Mammor skattade mer enighet än pappor rörande alla områden utom hushållsuppgifter. Föräldrar med depressiva symptom skattade mindre enighet än föräldrar utan depressiva symptom.

I studie II undersöktes om det fanns samband mellan föräldrars depressiva symptom och 'känsla av sammanhang' samt upplevelse av barnets temperament. 'Känsla av sammanhang' skattades när barnet var tre månader med hjälp av tre frågor om hanterbarhet, begriplighet, och meningsfullhet utifrån Antonovskys teori om 'känsla av sammanhang'. Föräldrarna skattade barnets temperament vid tre och 18 månaders ålder med nio påståenden där föräldrarna uppmanades att skatta hur de upplevde sina barn i jämförelse med barn i allmänhet. Föräldrar med depressiva symptom skattade lägre 'känsla av sammanhang' och upplevde barnets temperament som 'svårare', än föräldrar utan depressiva symptom.

I studie III undersöktes om det fanns samband mellan depressiva symptom, föräldrarnas enighet i förhållandet samt föräldrastress och föräldrars separation 6-8 år efter barnets födelse. Till separerade par, räknades par som inte längre var skrivna på samma adress, vilket överensstämde för 20% av paren. Resultaten visade depressiva symptom, mindre enighet i förhållandet och föräldrastress hade samband med ökat antal separationer.

Resultaten från studie IV visade att depressiva symptom sex veckor efter barnets födelse hade samband med föräldrars försämrade bonding med barnet sex månader efter födelsen. Högsta förekomsten av försämrad bonding förekom i de par där båda föräldrarna skattade depressiva symptom. Vidare fanns det samband mellan föräldrarnas försämrade bonding och depressiva symptom, liksom erfarenhet av försämrad relation mellan föräldrarna när barnet var sex månader.

Resultatet stödjer tidigare forskning att både mammor och pappor kan drabbas av depressiva symptom. Dessutom återfanns samband mellan depressiva symptom och lägre 'känsla av sammanhang', att barnet upplevs 'svårare' än barn i genomsnitt samt försämrad bonding till barnet. Det är viktigt att uppmärksamma att inte bara nyblivna mammor kan drabbas av depressiva symptom utan att även nyblivna pappor. Denna kunskap är viktig för vårdpersonal samt för allmänheten. Föräldrar som önskar bör erbjudas stöd under

graviditet och föräldraskap för att optimera förutsättningarna för barnen, familjen och att förebygga separation mellan föräldrarna. Att förstå samband mellan depressiva symtom, enighet i förhållandet samt föräldrastress och separation mellan föräldrarna är viktigt för vårdpersonal. Separation är inte alltid ofrånkomlig och kan i vissa fall vara gynnsamt om förhållandet innefattar frekventa konflikter, hot och/eller våld etc. Denna avhandling visar att det är betydelsefullt att identifiera problem i föräldraskapet tidigt för att i möjligaste mån skapa en förbättrad situation för dessa familjen och därmed en mer gynnsam utveckling för barnet.

Utifrån dessa resultat föreslås att mödra- och barnhälsovården screenar för depressiva symtom. Socialstyrelsen rekommenderar screening med EPDS för mammor sex till åtta veckor efter barnets födelse vilket även görs på många Barnavårdcentraler. Utifrån denna studie rekommenderas även att, åtminstone när mamman uppvisar depressiva symtom, screena pappan eftersom det finns samband mellan mammans och pappans depressiva symtom. Det är betydelsefullt för hela familjen välmående att uppmärksamma mammor och pappors mentala hälsa.

Framtida forskning bör fokusera på hur depressiva symtom hos mammor och pappor bäst kan upptäckas samt att utvärdera effektiva behandlingsmetoder. En interventionsstudie som undersöker hur rörelse som motion och/eller dans påverkar föräldrar i tidigt föräldraskap är en spännande tanke. Att motion kan bidra till lindring av depressiva symtom är väl känt, kanske kan det förebygga och/eller hjälpa föräldrar med depressiva symtom. Att även genomföra kvalitativa studier kan ge mer kunskaper om tidigt föräldraskap i relation till depressiva symtom.

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