Psychological perspectives on fear of birth: heterogeneity, mechanisms and treatment

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Abstract

Although it is medically safe to give birth in most western countries, the vast majority of pregnant women experience some kind of anxiety, fear or worry in relation to their pregnancy or the upcoming childbirth. Most pregnant women find ways of coping with these issues but, for many, fear of birth is a significant source of distress during pregnancy, with negative consequences both when giving birth and in the postpartum period.

Previous research on fear of birth has for the most part had a medical perspective, investigating risk factors and consequences of this form of fear or anxiety, along with studies evaluating different forms of interventions. The general aim of this thesis was to approach fear of birth from a psychological perspective, by exploring the role of psychological factors in this form of fear, worry or anxiety.

Four studies are included in the thesis. The first study is a randomized controlled trial, in which we compared a guided Internet-delivered self-help program, based on cognitive behavior therapy (guided ICBT), with standard care (midwife led fear of birth specific counseling), for the treatment of fear of birth. Despite poor adherence to the guided ICBT, the results showed a similar reduction in fear levels during pregnancy in both groups, with lower levels of fear of birth in the guided ICBT group one year after birth. The second study is a narrative literature review. This study adopted a psychological perspective on the existing literature describing fear of birth, with a special focus on the specificity of this form of fear or anxiety, the pathways of fear acquisition, and the physiological, cognitive and behavioral aspects of fear of birth. Using systematic procedures for the literature search, inclusion and exclusion, 89 original research papers were included and summarized in the study. The aim of the third study was to explore possible heterogeneity among pregnant women reporting high levels of fear of birth. Comparisons between primiparous and multiparous women revealed that these groups were very similar in their levels of fear of birth as well as in the psychological variables investigated. Using a series of hierarchical and non-hierarchical cluster analyses, five possible subgroups based on psychological characteristics were identified, pointing to psychological heterogeneity among women fearing birth. In the fourth study, our aim was to take a first step in trying to identify psychological mechanisms relevant to the understanding of fear of birth. In this study, pain catastrophizing and intolerance of uncertainty were clear predictors of fear of birth, while parity was not.
Taken together, the results of the four studies included in this thesis indicate that fear of birth is a concept in need of further investigation, and that psychological perspectives could offer an important contribution to our understanding of this form of fear or anxiety. Women fearing birth seem to be a heterogeneous group, and psychological characteristics (e.g. pain catastrophizing, or catastrophizing in general, and intolerance of uncertainty) might be of greater importance than parity in both describing this diversity and understanding the development and maintenance of fear of birth. Treating fear of birth using guided ICBT can be challenging, and before introducing this form of treatment as an alternative, further refinement and evaluation of the methods are needed.

Keywords: fear of birth, anxiety, pregnancy, childbirth, parity, Internet-delivered cognitive behavior therapy, RCT, literature review, heterogeneity, transdiagnostic mechanisms, pain catastrophizing, intolerance of uncertainty
Summary in Swedish

Även om det medicinskt sett är förhållandevis säkert att föda barn i Sverige och andra västerländska länder, uppgår de flesta gravida kvinnor att de känner en viss mån av rädsla, oro eller ångest kopplat till graviditeten eller den väntande förlossningen. De flesta kvinnor hittar ett sätt att hantera dessa upplevelser, men för många blir rädsla och oro inför förlossningen ständiga följeslagare under graviditeten.

Den befintliga forskningen om förlossningsrädsla har huvudsakligen utgått ifrån ett medicinskt perspektiv. Förlossningsrädsla har kopplats till olika riskfaktorer och till negativa konsekvenser i samband med förlossningen eller under den närmaste tiden därefter. Ett antal studier har också utvärderat olika interventioner för att förebygga eller behandla förlossningsrädsla. Huvudsyftet med denna avhandling har varit att undersöka förlossningsrädsla utifrån ett psykologiskt perspektiv, och fokus har därmed legat på att studera psykologiska faktors betydelse i relation till denna form av rädsla, oro eller ångest.

Avhandlingen innehåller fyra studier. Den första är en randomiserad kontrollerad studie, i vilken vi har jämfört effekterna av Internet-baserad kognitiv beteendeterapi med terapeutstöd och svensk standardvård (samtalssöd med barnmorska) vid förlossningsrädsla. Trots lågt deltagande i den kognitiva beteendeterapin minskade graden av förlossningsrädsla på ett jämförbart sätt i båda behandlingsgrupperna under graviditeten, och ett år efter födseln var graden av rädsla något lägre i gruppen som erbjudits kognitiv beteendeterapi. Avhandlingens andra studie är en narrativ litteraturöversikt, som ger ett psykologiskt perspektiv på den befintliga forskningen om förlossningsrädsla. I studien sammanfattas fynd från 89 vetenskapliga artiklar, med ett särskilt fokus på resultat som kan ge oss ledtrådar om hur specifik denna form av rädsla är, rädslans olika inlärningsvägar, samt kognitiva, fysiologiska och beteendemässiga aspekter av förlossningsrädsla. Den tredje studien syftade till att undersöka potentiell heterogenitet bland gravida kvinnor med hög grad av förlossningsrädsla. Jämförelser mellan förstföderskor och omföderskor visade att dessa grupper var förhållandevis lika avseende grad av rädsla och psykologiska karakteristika. Istället identifierades fem möjliga subgrupper utifrån kvinnornas svarsmönster på psykologiska självskattningsinstrument. Resultaten från denna studie tyder på att skillnaderna mellan först- och omföderskor kanske inte är så stora i detta avseende, men att det kan finnas andra källor till psykologisk heterogenitet bland kvinnor med hög grad av
förlossningsrädsla. Syftet med den fjärde studien var att ta ett första steg för att identifiera psykologiska mekanismer av betydelse för förståelsen för förlossningsrädsla. Höga självskattningar av smärtkatastrofiering och intolerans för osäkerhet predicerade hög grad av förlossningsrädsla. Däremot hade det ingen betydelse för graden av rädsla om deltagarna var först- eller omföderskor.

Sammantaget tyder resultaten från de fyra studierna på att förlossningsrädsla är ett fenomen som behöver studeras närmare, och att psykologiska perspektiv kan vara av betydelse för att öka vår förståelse för denna form av rädsla, ångest eller oro. Kvinnor med förlossningsrädsla tycks tillhöra en heterogen grupp, och psykologiska karakteristika såsom grad av smärtkatastrofiering eller intolerans för osäkerhet skulle kunna vara av större betydelse än paritet (d.v.s. om kvinnan är först- eller omföderska) för att beskriva denna mångfald och förstå hur förlossningsrädsla utvecklas och vidmakthålls. Att behandla förlossningsrädsla med Internet-baserad kognitiv beteendeterapi har sina utmaningar, och innan ett sådant behandlingsalternativ kan introduceras inom mödravården krävs fortsatt förfinning och utvärdering av metoden.

Sökord: förlossningsrädsla, ångest, graviditet, förlossning, paritet, Internet-baserad kognitiv beteendeterapi, randomiserad kontrollerad studie, litteraturöversikt, heterogenitet, transdiagnostiska mekanismer, smärtkatastrofiering, intolerans för osäkerhet
List of papers


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# Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>CAQ</td>
<td>Cognitive Avoidance Questionnaire</td>
</tr>
<tr>
<td>CBT</td>
<td>Cognitive Behavior Therapy</td>
</tr>
<tr>
<td>CI</td>
<td>Confidence Interval</td>
</tr>
<tr>
<td>DSM-5</td>
<td>Diagnostic and Statistical Manual of Mental Disorders, fifth edition</td>
</tr>
<tr>
<td>EPDS</td>
<td>Edinburgh Postnatal Depression Scale</td>
</tr>
<tr>
<td>EPDS-A</td>
<td>Anxiety subscale of Edinburgh Postnatal Depression Scale</td>
</tr>
<tr>
<td>FOBS</td>
<td>Fear of Birth Scale</td>
</tr>
<tr>
<td>HADS</td>
<td>Hospital Anxiety and Depression Scale</td>
</tr>
<tr>
<td>HADS-A</td>
<td>Anxiety subscale of Hospital Anxiety and Depression Scale</td>
</tr>
<tr>
<td>HADS-D</td>
<td>Depression subscale of Hospital Anxiety and Depression Scale</td>
</tr>
<tr>
<td>ICBT</td>
<td>Internet-Delivered Self-Help building on Cognitive Behavior Therapy</td>
</tr>
<tr>
<td>ICD-10</td>
<td>International Statistical Classification of Diseases and Related Health Problems - Tenth Revision</td>
</tr>
<tr>
<td>IPSA</td>
<td>Injection and Phobia Scale – Anxiety</td>
</tr>
<tr>
<td>IPSAV</td>
<td>Injection and Phobia Scale – Avoidance</td>
</tr>
<tr>
<td>IUI-B</td>
<td>Intolerance of Uncertainty Inventory part B</td>
</tr>
<tr>
<td>OR</td>
<td>Odds Ratio</td>
</tr>
<tr>
<td>PBSE</td>
<td>Performance Based Self-Esteem</td>
</tr>
<tr>
<td>PCS</td>
<td>Pain Catastrophizing Scale</td>
</tr>
<tr>
<td>PRAQ-R</td>
<td>Pregnancy Related Anxieties Questionnaire – Revised</td>
</tr>
<tr>
<td>PSS-SR</td>
<td>PTSD Symptom Scale – Self-Report</td>
</tr>
<tr>
<td>PTSD</td>
<td>Posttraumatic Stress Disorder</td>
</tr>
<tr>
<td>RCT</td>
<td>Randomized Controlled Trial</td>
</tr>
<tr>
<td>U-CARE</td>
<td>Uppsala University Psychosocial Care Program</td>
</tr>
<tr>
<td>UP</td>
<td>Unified Protocol for Transdiagnostic Treatment of Emotional Disorders</td>
</tr>
<tr>
<td>W-DEQ</td>
<td>Wijma Delivery Expectancy/Experience Questionnaire</td>
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<tr>
<td>WW-II</td>
<td>Why Worry II</td>
</tr>
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</table>
Definitions

**Fear or birth**: experiences of fear, anxiety or worry relating to future childbirth, defined continuously rather than categorically

**Birth**: vaginal or cesarean birth

**Parity**: the number of children a woman has given birth to, including both live-born children and stillbirths

**Primipara (or nullipara)**: a pregnant individual who has not given birth before

**Multipara**: a pregnant individual who has given birth previously, including both live-born children and stillbirths
Preface

I commenced this work with a naïve belief that there must be a great deal of knowledge regarding the psychology of fear of birth. I had the opportunity to be welcomed into a multidisciplinary research team, assembled to conduct a randomized controlled trial to evaluate the effect of two different treatment models for fear of birth - midwife led counseling, which is the Swedish standard care for this form of fear, and Internet-delivered cognitive behavior therapy. During my first year as a PhD student, I was on parental leave with my third son. Before he was born, I was involved in planning the cognitive behavioral intervention and writing the self-help material, and during his first year I was one of the psychologists guiding participants through the program. Despite all our efforts, we had severe problems in engaging women to take part in the cognitive behavioral self-help program. Although it was relatively easy to recruit women to the study, it seemed that they did not believe in this type of treatment.

When I started to work full time, my first focus was to become more acquainted with previous research regarding fear of birth. It soon became apparent that very little was known about the psychological mechanisms in this form of fear or anxiety. The questions lined up in my head. Could fear of birth really be viewed as one, single, coherent concept? Could it be the manifestation of a range of different forms of anxiety? Could there be subgroups with different needs? To what extent does it matter if the woman is expecting her first child or has given birth before? What psychological mechanisms might contribute to this form of fear? Is it really a fear, or would it be better to conceptualize it as anxiety? Or worry?

Although the initial aim of this thesis was to develop and evaluate different treatment models for fear of birth, all of these questions pulled my interest and attention in another direction. Most previous research on fear of birth had taken a medical perspective, investigating risk factors and consequences of this form of fear or anxiety. To contribute with new perspectives, I wanted to bring this research closer to the field of psychology. One may believe that writing a thesis is about giving new answers. In my case, this thesis has been about asking new questions, and challenging some of the “truths” we share about fear of birth.

This thesis is written for readers with different cultural, professional and scientific backgrounds - for anyone that may share my interest in these questions. It is written for all of you encountering fear of birth in your clinical
work, for all researchers interested in this field, and for each and every one
with personal experiences of this form of fear.
1 Introduction

Although it is medically safe to give birth in most western countries, nearly 80% of pregnant women experience some kind of anxiety, fear or worry in relation to their pregnancy or the upcoming childbirth (Melender, 2002). From an evolutionary perspective, some level of anxious apprehension during pregnancy might be functional in guiding the woman to a safe and supportive environment and making her attend to physiological cues telling her to rest or seek help. Most pregnant women find their ways of coping with these issues but, for many women, the anxious apprehension during pregnancy leads to significant emotional distress. Some of the pregnancy-specific anxieties may relate to worry regarding the baby’s health and development during pregnancy, or concern about changes in one’s bodily appearance (Huizink, Mulder, de Medina, Visser, & Buitelaar, 2004). A third source of distress is fear, worry or anxiety relating to the upcoming childbirth. In a very general way, the aim of this thesis was to learn more about the anxious experiences relating to childbirth, and about the women reporting high levels of such distress. As the reader will see, there is no good definition or term for these experiences. For the sake of simplicity, they will be called fear of birth throughout this thesis.

In order to make the thesis available for readers from different cultural, professional and scientific backgrounds, this chapter is subdivided into three parts, giving you a brief introduction to the Swedish context of perinatal care, to the current scientific knowledge regarding fear of birth, and to central psychological theories relating to fear and anxiety.

Pregnancy and childbirth in the Swedish context

Since 1973, The Swedish Medical Birth Register has provided data on practically all births in Sweden. Every health care provider is obligated to report to the register, and the information available is collected from medical records in prenatal, delivery and neonatal care (Socialstyrelsen, n.d.). According to the official statistics in this register (Socialstyrelsen, 2018), there are about 110 000 – 120 000 births annually in Sweden. In 2016, 43% of the mothers giving birth were primiparas, and multiple births accounted for 1.4% of all births.
Swedish antenatal care

In Sweden, antenatal care is free of charge, and almost all pregnant women take part in the standard antenatal health care program. Midwives are the main providers of this antenatal care, with the possibility of referring to obstetricians if specialized maternity care is needed. The standard program, which can be extended if needed, includes two visits to the antenatal midwife during the first trimester, a standard ultrasound screening examination in pregnancy weeks 18-20, and 7-8 additional visits to the antenatal midwife from pregnancy week 24 and onwards. In addition, at least 70% of primiparous women and their partners also take part in free antenatal parental groups, provided by midwives in public antenatal care settings (Graviditetsregistret, n.d.).

A Swedish national survey, with data collected in the years 1999 and 2000, showed that the majority of women were satisfied with their antenatal care (Hildingsson & Rådestad, 2005), and qualitative analyses indicate that pregnant women give high value to both the medical and the psychological competence of their antenatal midwife (Hildingsson & Thomas, 2007).

Giving birth in Sweden

About 120 000 women gave birth in Sweden in 2016. Statistics from The National Board of Health and Welfare (Socialstyrelsen, 2018), show that as many as 82.3% gave birth vaginally. Instrumentally aided births (e.g. the use of forceps or vacuum assistance) accounted for 6.8% of the vaginal births. While 83.5% of vaginal births had a spontaneous onset, 16.5% were induced. More than half of all primiparas (53%), and 22% of the multiparas giving birth vaginally, used epidural analgesia. The overall rate of cesarean sections was 17.6%, with regional rates differing between 12.3% and 21.5%. Among the cesarean births, 7.9% were acute and 9.5% were planned cesarean sections. Following a singleton vaginal birth, the mean duration of in-patient care was 2.7 days for primiparas and 1.7 days for multiparas. Following a singleton cesarean birth, the mean in-patient stay was 3.9 days for primiparas and 3.3 days for multiparas.

Between 2000 and 2011, the total rate of cesarean sections in Sweden increased from 15.5% to 17.1% just as in most of the other Nordic countries (Pyykönen et al., 2017). The main contributors to this increase were more cesareans among multiparous women with a previous cesarean section, and increases in the cesarean section rates among nulliparous women with a single cephalic term pregnancy. Despite this increase, the Swedish rate of cesarean sections is still well below the rates in most well-developed countries.
In 2014, the overall European rate was estimated at 25% (22.4% in Northern Europe), with mean rates in Northern and Latin America and Oceania being even higher (Betrán et al., 2016). Although Swedish women cannot choose to have a cesarean birth, cesarean sections without medical indications are increasing in Sweden. From 1997 to 2006, this increase was threefold, from 4.7% to 15.3% of all full term cesarean sections (Karlström et al., 2010).

The Swedish model of care for fear of birth

Unlike in many other countries, there is an additional and specific model of care for fear of birth in Sweden. With some organizational differences, variations of this form of care is offered at all Swedish hospitals (Larsson, Karlström, Rubertsson, & Hildingsson, 2016). In meeting with the woman, the antenatal midwife asks about her feelings about giving birth, and uses her clinical judgement to assess the woman’s level of fear of birth. Mild to moderate fears are commonly handled within regular antenatal care, but if the woman discloses a more severe level of fear, she is typically referred for fear of birth specific counseling. Most often, this counseling is led by experienced and specially trained midwives on the labor ward, although appointments with obstetricians, psychologists or social workers may also be a part of the care model (Larsson et al., 2016).

The fear of birth specific counseling aims at reducing fear, strengthening the woman’s belief in her ability to give birth, and making the birth experience as positive as possible, irrespective of mode of birth. The particular strategies to meet these goals may vary, but commonly include validation of fear, information about the birth process, different modes of birth and pain relieving strategies, review of multipara’s previous birth records, relaxation and breathing exercises, preparation of a birth plan, and promises of, for example, early pain relief, or conversion to a cesarean section if labor is perceived as too traumatic (Björklund et al., 2017; Larsson et al., 2016). The number of sessions may vary, but in most cases two to four sessions are described as sufficient (Björklund et al., 2017). In 2016, 8 % of women giving birth in Sweden received extra support for fear of birth (Graviditetsregistret, n.d.).

Eighty percent of women who have been referred to midwife led fear of birth specific counseling are satisfied with the support given (Larsson, Karlström, Rubertsson, & Hildingsson, 2015). Still, when compared with women who have not been referred to such counseling during pregnancy, they more often give birth by a planned cesarean section. One year after birth, they report more negative birth experiences and higher levels of fear of birth,
and are more likely to wish for a cesarean section in case of another birth (Larsson et al., 2015). When comparing women with fear of birth who did, and did not receive specific counseling, fear of birth decreased more in the non-counseling group (Hildingsson, Haines, Karlström, & Nystedt, 2017). However, these results may not be entirely unbiased, since women in the non-counseling group had a lower initial fear of birth score than the women in the counseling group.

Fear of birth

Fear of birth - a poorly defined concept

To date, no clear-cut definition of a clinical state of fear of birth, comparable to the diagnostic criteria presented in the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM–5; American Psychiatric Association, 2013) exists. No list of relevant symptoms or fear objects has been composed, nor have any guidelines for differential diagnostic or assessment of functional impairment or symptom severity been suggested. Instead, childbirth-related anxiety is typically viewed on a continuum, ranging from almost no fear to a fear that is extreme (Wijma, 2003). Unfortunately, there is no agreement on how this continuous concept should be labeled, which aspects it should include, which scales should be used to measure it, or at what cut-off point a clinically relevant level of fear of birth is reached.

Different terms, more or less overlapping, can be found in the literature. Most of them describe the emotional experience as fear rather than anxiety, commonly as fear of childbirth (Areskog, Uddenberg, & Kjessler, 1981; Wijma, Wijma, & Zar, 1998), childbirth fear, childbirth-related fear, or fear of birth. Some researchers have chosen to use the term tokophobia, originally defined as a state where childbirth (tokos) is avoided whenever possible due to fear of dying (Hofberg & Brockington, 2000). Along with this definition, a distinction between primary tokophobia, i.e. when fear predates first pregnancy, and secondary tokophobia, following a traumatic or distressing childbirth, is also suggested (Hofberg & Brockington, 2000).

Other concepts relating to fear of birth are pregnancy anxiety or pregnancy-specific anxiety (Huizink et al., 2004). When using these terms, the researchers generally refer to a broader spectrum of anxieties, with issues relating to childbirth being one of many dimensions (Bayrampour et al., 2016).
Assessing fear of birth

In the absence of clear-cut classifications and definitions, a wide array of methods has been used to capture fear of birth, including more or less validated instruments, single questions, and diagnostic codes.

The most widely used self-report questionnaire is the Wijma Delivery Expectancy-Experience Questionnaire (W-DEQ; Wijma et al., 1998). The 33 items in this scale refer to cognitive and emotional expectations of the forthcoming childbirth (e.g. “How do you think you will feel in general during the labor and delivery?”), and are reported on a 6-point Likert scale with anchor words indicating opposite extremes of the expected experiences (e.g. “Extremely strong” vs. “Not at all strong” or “Extremely proud” vs. “Not at all proud”). With a total range of 0-165, scores of 85 or higher are commonly interpreted to indicate severe fear of childbirth, and scores of 100 or higher as very intense fear (Ryding, Wijma, & Wijma, 1998; Ryding, Persson, Onell, & Kvist, 2003). However, other cut-off points and words to describe the level of fear have also been used. W-DEQ has shown good psychometric qualities; the scores are typically normally distributed, and the internal reliability is generally high (Wijma et al., 1998).

Although widely used, W-DEQ has received some criticism regarding its multidimensional structure (Fenaroli & Saita, 2013; Fenwick, Gamble, Nathan, Bayes, & Hauck, 2009; Garthus-Niegel, Størksen, Torgersen, Von Soest, & Eberhard-Gran, 2011; Johnson & Slade, 2002; Lukasse, Schei, & Ryding on behalf of the Bidens Study Group, 2014; Pallant et al., 2016), limitations in the cultural transferability of some of the items, and the length of the instrument (Haines et al., 2015).

Looking for a unidimensional way of measuring fear of birth, the Fear of Birth Scale (FOBS) was developed by a collaborative effort of Australian and Swedish researchers (Haines, Pallant, Karlström, & Hildingsson, 2011). In FOBS, the question, “How do you feel right now about the approaching birth?” is to be answered using two 100 mm visual analogue scales, with the anchors (a) “calm” and “worried”, and (b) “no fear” and “strong fear”. The two ratings are then combined using the mean, which gives FOBS a range of 0-100.

While W-DEQ measures fear of childbirth in an indirect manner, FOBS is both considerably shorter and more direct in its approach. In a comparison between the two instruments, a correlation of Spearman’s rho = .66, p < 0.001, and high sensitivity of a FOBS cut-point of 54 was found (Haines et al., 2015). However, both a lower cut point of FOBS ≥ 50 (Haines et al., 2011) and a higher cut point of FOBS ≥ 60 (Hildingsson et al., 2017; Ternström, Hildingsson, Haines, & Rubertsson, 2015) have also been used. Although still a relatively
new instrument for measuring fear of birth, FOBS has shown strong internal consistency (Haines et al., 2015; Haines et al., 2011). In a qualitative validation of the scale, pregnant women had no trouble distinguishing the two concepts included or rating their experiences (Ternström, Hildingsson, Haines, & Rubertsson, 2016), indicating good face validity.

Other instruments used for the assessment of fear of birth are, for example, the Childbirth Attitudes Questionnaire (Lowe, 2000), the Fear of Childbirth Questionnaire (Areskog, Kjessler, & Uddenberg, 1982), and the Pregnancy-Related Anxieties Questionnaire - Revised, PRAQ-R (Huizink et al., 2004). The diagnostic code O99.80, which stands for other specified diseases and conditions complicating pregnancy, childbirth and the puerperium in the International Statistical Classification of Diseases and Related Health Problems - Tenth Revision (ICD-10), has also been used (Räisänen et al., 2014). In other studies, fear of birth is measured using a single visual analogue scale (Rouhe, Salmela-Aro, Halmesmaeki, & Saisto, 2009), a few selected items from other scales, or a single item question. Several studies also define their study group based on a referral for counseling due to fear of birth.

### Prevalence of fear of birth

In order to rate the prevalence of a phenomenon, it needs to be conceptualized in categorical terms. Given that fear of birth is a continuous concept that can be defined and measured in numerous ways, estimations of its prevalence are equivocal. In a recent systematic review and meta-analysis, prevalence ratings ranging between 3.7% and 43% were used to calculate a pooled worldwide prevalence of 14% (O’Connell, Leahy-Warren, Khashan, Kenny, & O’Neill, 2017). As can be understood from the wide prevalence range, the results also showed great heterogeneity between studies. Although differences in the pooled prevalence could be seen between primiparous and multiparous women, depending on the time of measurement and the geographic region of the study, the sensitivity analysis could not explain this heterogeneity.

Although not fully explaining the heterogeneity in prevalence, cultural differences in prevalence of fear of birth seem to exist. When combining prevalence ratings using W-DEQ, Nilsson et al. (2018) revealed significant differences among seven European countries included in the study, with the Swedish overall prevalence of 14.3% being among the highest. Great geographical differences were also found in the meta-analysis by O’Connell et al. (2017). In this study, the pooled prevalence of fear of birth was 12% in
the Scandinavian countries, 8% in the rest of Europe, 11% in America, 23% in Australia, and 25% in studies with an Asian origin.

In the few studies measuring fear of birth using FOBS, prevalence ratings also differ depending on the cut-off point being used. Using a cut-off point of FOBS ≥ 50, a prevalence of 30% was found in an Australian sample (Haines et al., 2011), while a cut-off point of FOBS ≥ 60 has indicated a prevalence ranging between 18 and 22% in Swedish samples (Hildingsson et al., 2017; Ternström et al., 2015).

Common fears and worries relating to childbirth

Most commonly, pregnant women describe fears relating to the process of giving birth, e.g. relating to the anticipated experiences during contractions and “pushing”, the duration of the process, and the risk of tearing (Eriksson, Westman, & Hamberg, 2006; Matinnia et al., 2015). Fears relating to specific interventions that might be needed (e.g. vacuum extraction or epidural anesthesia) and fear of pain are also described (Geissbuehler & Eberhard, 2002; Ryding, Wirfelt, Wängborg, Sjögren, & Edman, 2007). Another common theme is fears relating to the life and wellbeing of both the mother and the baby (Eriksson et al., 2006; Geissbuehler & Eberhard, 2002; Matinnia et al., 2015).

Both pregnant women in general, and women with a more pronounced fear of birth, also report fears relating to their own capabilities and reactions during childbirth (Eriksson et al., 2006; Matinnia et al., 2015), fear of losing control (Areskog et al., 1981; Fisher, Hauck, & Fenwick, 2006; Sjögren, 1997), and worries accentuated by the unpredictability of childbirth and the lack of control and guaranties (Fenwick et al., 2009; Fisher et al., 2006). Some are worried about not being properly taken care of by the health care personnel (Matinnia et al., 2015; Melender, 2002; Sjögren, 1997) or not being allowed to influence decisions (Ryding et al., 2007). The partner’s capabilities and reactions during childbirth give rise to worries in some pregnant women (Eriksson et al., 2006; Fenwick et al., 2009), as well as issues relating to parenthood, future partner relationships and sexuality (Matinnia et al., 2015; Melender, 2002; Serçeküş & Okumuş, 2009; Sjögren, 1997; Tsui et al., 2007).

In a recently published meta-synthesis of reported contents of fear, the unpredictability of childbirth was found to be the overarching theme linking all the specific fear elements (Sheen & Slade, 2018).
The role of parity in fear of birth

In research relating to pregnancy and childbirth, the parity of women is always an important factor to consider. Parity refers to the number of times a woman has given birth to a child, live or stillborn (Marshall & Raynor, 2014). Although the parity of a woman can be described in even more specific terms, it is often enough to distinguish between women expecting their first child (nulliparas or primiparas) and women who have given birth before (paras or multiparas). This distinction is also relevant with regard to fear of birth.

In the year 2000, the British Journal of Psychiatry published a paper describing 26 cases of tokophobia, (i.e. fear of birth) written by Kristina Hofberg and Ian Brockington (Hofberg & Brockington, 2000). Among the participants, some were said to have experienced fear of birth for a very long time, while others had developed their fear after a previous birth. Based on these descriptions, the authors stated that two different forms of tokophobia exist: primary tokophobia that predates first pregnancy, and secondary tokophobia, that occurs after a traumatic or distressing childbirth. This distinction was not new (the authors cite, for example, Louis Victor Marcé describing the different fears of primiparous and multiparous women as early as 1858), and it is still generally upheld both in clinical care and research. However, the evidence for a distinction between primary and secondary fear of birth is not always very clear.

Two lines of evidence could be used to support the distinction. In most studies, primiparas report higher mean levels of fear of birth than multiparas (Adams, Eberhard-Gran, & Eskild, 2012; Niimen, Stephansson, & Ryding, 2009; Rouhe et al., 2009; Ternström et al., 2015; Toohill, Fenwick, Gamble, & Creedy, 2014). This can also be seen in the prevalence of fear of birth, where the worldwide pooled prevalence in studies including primiparous women was found to be 16%, while the corresponding prevalence for studies with multiparous women was 12% (O’Connell et al., 2017).

Another argument could be based on results from the validation of W-DEQ, where the authors ranked the ten items with the strongest correlations with the total score of the scale (Wijnma et al., 1998). Of the ten items, seven could be found on the top ten list for both primiparous and multiparous women, but the order of the ranked items differed. The authors interpret this finding as a difference in fears between primiparous and multiparous women. While the fears of primiparous women are described as associated with weakness and uncertainty, the items correlating most strongly with fear of birth among multiparous women are said to more clearly express fear.
However, there are also findings that do not point to a clear distinction between primary and secondary fear of birth. Levels of fear of birth seem to correlate over time. Reports of fear of birth during pregnancy are positively correlated with fear during childbirth (Alehagen, Wijma, & Wijma, 2006; Kjærgaard, Wijma, Dykes, & Alehagen, 2008) and postpartum levels of fear of birth (Alehagen et al., 2006; Fenwick et al., 2009; Nilsson, Lundgren, Karlström, & Hildingsson, 2012; Ryding et al., 2007; Wijma, Ryding, & Wijma, 2002; Zar, Wijma, & Wijma, 2001). Women reporting fear of birth during one pregnancy are also at an increased risk of reporting fear in a second pregnancy, OR = 6.24, 95% CI [4.91, 7.93] (Lukasse, Vangen, Øian, & Schei, 2011).

With regard to potential differences in the content of fear, this question has not received much attention thus far. In a study by Geissbuehler and Eberhard (2002) more than 8,500 pregnant women were asked to indicate if they experienced fear regarding ten specific aspects of childbirth. Although not testing for the significance of differences between the groups, the results are presented for primi-, secundi-, and multiparous women. As suggested by the percentage of women indicating each aspect of fear, there does not seem to be a great difference between the parity groups, other than possibly a general reduction in frequency with increasing parity.

Risk- and protective factors for fear of birth

While stability in partner relations, and support from a partner has been found to contribute to a sense of security or reduced risk for fear of birth (Melender & Lauri, 2002; Poikkeus et al., 2006), lack of partner (Melender, 2002; Räisänen et al., 2014), dissatisfaction with partnership (Saisto, Salmela-Aro, Nurmi, & Halmesmäki, 2001), or dissatisfaction with partner support (Gao, Liu, Fu, & Xie, 2015) have instead been related to increased risks. Comparable results have also been found regarding access to social networks and social support (Laursen, Hedegaard, & Johansen, 2008; Melender & Lauri, 2002; Saisto et al., 2001; Söderquist, Wijma, & Wijma, 2004). Other risk factors suggested in the literature are: belonging to an ethnic minority background (Redshaw & Heikkilä, 2011), being pregnant in another country than your country of birth (Ternström et al., 2015) or living in an urban rather than a rural area (Melender, 2002).

Studies relating fear of birth to other demographic or socioeconomic factors do not show very clear and consistent patterns. For example, both old (Nieminen et al., 2009; Räisänen et al., 2014) and young maternal age (Gao et al., 2015; Laursen et al., 2008) have been found to be risk factors in some studies, while not associated with childbirth-related anxiety in others (Jokić-
Maternal educational level and employment status have not been associated with fear of birth in some studies (Jokić-Begić et al., 2014; Nieminen et al., 2009; Nilsson et al., 2012), while low educational level (Gao et al., 2015), or being unemployed or having an unskilled job have (Laursen et al., 2008; Saisto et al., 2001). However, high socioeconomic status has also been found to be a risk factor for expressing this form of fear or anxiety (Räisänen et al., 2014). Hence, except for the apparent protection offered by access to support from a partner and/or a social network, and the risk factor of belonging to a cultural minority group, the pattern of associations between sociodemographic factors and childbirth-related anxiety shown thus far is irregular and difficult to interpret.

A few studies have investigated whether experiences of violence and abuse might increase the risk for fear or birth. In a Norwegian sample of 86 women requesting a planned cesarean birth and described as having moderate or severe levels of fear of birth, 63% reported having been subjected to violence, threat of violence, sexual abuse, or incest (Nerum, Halvorsen, Soerlie, & Oeian, 2006). Compared to women that have not experienced abuse, higher levels of fear of birth have been found among women reporting physical, sexual or emotional abuse during childhood (Heimstad, Dahloe, Laache, Skogvoll, & Schei, 2006; Lukasse et al., 2010, 2011), but not among women reporting physical or sexual abuse in adult life (Heimstad et al., 2006; Schroll, Tabor, & Kjaergaard, 2012). Therefore, despite the alarming results presented by Nerum et al. (2006), the associations between fear of birth and experiences of abuse or violence still need to be clarified. Experiences of being offended, disrespected, or taken advantage of while visiting health services also need to be considered, since such experiences have been associated with fear of birth among primiparous women (Lukasse et al., 2015).

In multiparous women, the relationship between fear of birth and retrospectively reported previous childbirth experiences has been addressed in several studies, showing somewhat inconsistent results. Studies addressing the relation between fear of birth and previous cesarean sections in general, show significant differences in fear levels between women with a previous cesarean or vaginal birth (Rouhe et al., 2009), a higher frequency of previous cesarean sections among women with severe fear of birth (Ryding et al., 2015), and odds ratios for fear of birth in a second pregnancy ranging between 1.41 and 3.38 if a woman has previously given birth with cesarean section (Lukasse et al., 2011; Nieminen et al., 2009; Räisänen et al., 2014). However, in other
studies, such associations are not supported (Fenwick et al., 2009; Haines et al., 2011; Toohill et al., 2015).

When looking more specifically at different birth modes as risk factors for fear of birth, findings are inconclusive with regard to previous planned cesarean sections (Haines et al., 2011; Nilsson et al., 2012; Toohill, Fenwick, Gamble, & Creedy, 2014; Waldenström, Hildingsson, & Ryding, 2006), and instrumental deliveries (Haines et al., 2011; Lukasse et al., 2011; Nieminen et al., 2009; Nilsson et al., 2012; Rouhe et al., 2009; Toohill, Fenwick, Gamble, & Creedy, 2014). With regard to previous emergency cesarean sections, the findings are more convincing in supporting a relation with fear of birth, with odds ratios for fear of birth in a subsequent pregnancy ranging between 5.0 (Larsson et al., 2015) and 26.9 (Saisto, Ylikorkala, & Halmesmäki, 1999). Also, findings regarding previous negative birth experiences or traumatic births generally support an association with subsequent fear of birth, with relative risks and odds ratios ranging between 4.73 and 8.95 (Lukasse et al., 2010, 2011; Nilsson et al., 2012; Størksen, Garthus-Niegel, Vangen, & Eberhard-Gran, 2013).

The role of obstetric risk factors is investigated, in general, among multiparous women only. However, Gao et al. (2015) found that previous experience of miscarriage was associated with higher levels of fear of birth in a Chinese sample of pregnant women, where 83% of the participants were primiparous. Hence, previous obstetric experiences are likely to be of importance also for primiparous women.

**Fear of birth and emotional disorders**

Fear of birth is typically conceptualized as a phenomenon within the domain of anxiety (Huizink et al., 2004; Wijma et al., 1998), and the associations between this form of fear or anxiety and general measures of both anxiety and depression have been established in several studies. Fear of birth has been found to correlate with anxiety in general (Garthus-Niegel et al., 2011; Laursen et al., 2008; Rubertsson, Hellström, Cross, & Sydsjö, 2014), trait anxiety (Heimstad et al., 2006; Jokić-Begić et al., 2014; Pazzagli et al., 2015; Spice, Jones, Hadjistavropoulos, Kowalyk, & Stewart, 2009), state anxiety (Alipour, Lamyian, Hajizadeh, & Vafaei, 2011; Hall et al., 2009; Heimstad et al., 2006; Pazzagli et al., 2015), and both depressive symptoms and depression (Garthus-Niegel et al., 2011; Laursen et al., 2008; Räisänen et al., 2014; Saisto et al., 2001; Toohill et al., 2015). Associations have also been shown with psychiatric diagnoses, care or medication in general (Nordeng, Hansen, Garthus-Niegel, & Eberhard-Gran, 2012; Rouhe, Salmela-Aro, Gissler,
Halmesmaeki, & Saisto, 2011), and with specific psychiatric syndromes, such as mood and anxiety disorders, posttraumatic stress disorder (PTSD), psychosis, personality disorder, substance abuse, and eating disorder (Rouhe et al., 2011).

Psychological factors relating to fear of birth

There has not been much focus on identifying psychological mechanisms contributing to the development and maintenance of fear of birth. Anxiety sensitivity has been correlated with fear of birth in a few studies (Handelzalts et al., 2015; Jokić-Begić et al., 2014; Spice et al., 2009), with the most evident associations being shown for the physical concerns subscale (Jokić-Begić et al., 2014; Spice et al., 2009).

Furthermore, childbirth specific self-efficacy, with its two sub-constructs outcome expectancy, i.e. the belief that a given behavior could be of help in a given situation, and efficacy expectancy, i.e. the belief in one’s ability to perform certain behaviors that might be helpful in a specific situation (Lowe, 1993), seem to be associated with fear of birth. Negative correlations with fear of birth have been found for childbirth specific self-efficacy in general, as well as for both outcome expectancy and efficacy expectancy, although efficacy expectancy thus far has shown the strongest associations with fear of birth (Beebe, Lee, Carrieri-Kohlman, & Humphreys, 2007; Lowe, 2000; Salomonsson, Gullberg, Alehagen, & Wijma, 2013; Schwartz et al., 2015).

Some studies have assessed the relation between fear of birth and the individual’s appraisal of her adaptive resources to cope with stressful situations, showing significant differences in stress coping ability between women with and without fear of birth (Ryding, Wijma, Wijma, & Rydhström, 1998), and in levels of fear of birth between women with low and high stress coping ability (Söderquist et al., 2004). Still, no consistent pattern has been shown regarding the predictive role of stress coping ability for fear of birth (Söderquist et al., 2004; Wijma et al., 2002).

Pain catastrophizing refers to “an exaggerated negative ‘mental set’ brought to bear during actual or anticipated pain experience” (Sullivan et al., 2001, p. 53). Although fears relating to pain are commonly reported among women fearing birth (Ryding et al., 2007; Sjögren, 1997), the potential role of pain catastrophizing in fear of birth has not been explored. The few studies investigating pain catastrophizing from other perspectives relating to childbirth, have suggested this concept to be of importance for the anticipation of childbirth pain (Flink, Mroczek, Sullivan, & Linton, 2009), fear of being overwhelmed by pain (Van den Bussche, Crombez, Eccleston, &
Sullivan, 2013), cesarean section as the preferred mode of birth (ChoobMasjedi, Hasani, Khorsandi, & Ghobadzadeh, 2012; Dehghani, Sharpe, & Khatibi, 2014), the experience of pain intensity during birth, and poorer physical recovery following childbirth (Flink et al., 2009). Pain catastrophizing has also been found to mediate the relationship between fear of pain and preference for cesarean section (Dehghani et al., 2014).

**Consequences of fear of birth**

As with all forms of fear and anxiety, fear of birth is an aversive emotional experience, impacting on the well-being of whomever may report it. As shown by Hofberg and Brockington (2000), the dread of childbirth may appear as early as during adolescence, hence pre-dating a woman’s first pregnancy. Just as in other forms of anxiety, fear or anxiety relating to childbirth is likely to elicit behaviors functioning to avoid the feared stimulus (in this case childbirth). Although few studies specifically aim to explore fear of birth that predates first pregnancy, pregnant or postpartum women recollect having avoided, postponed or terminated pregnancies due to their fear (Hofberg & Brockington, 2000; Melender, 2002; Tsui et al., 2007). The time between pregnancies has also been found to be longer for women expressing fear of birth when compared to non-fearful women (Saisto et al., 1999; Sydsjö et al., 2013).

This form of fear or anxiety has also been related to negative consequences during childbirth and in the postpartum period. When giving birth, women with fear of birth report more pain (Beebe et al., 2007; Kjærgaard et al., 2008), and have longer birth durations (Adams et al., 2012; Reck et al., 2013; Sydsjö et al., 2013). A higher rate of planned cesarean sections is well documented within this group (Larsson et al., 2015; Ryding et al., 2015; Sydsjö et al., 2013; Waldenstroem et al., 2006), with a considerable proportion of nonmedical indications (Karlström et al., 2010; Ryding et al., 2015). A potential association between fear of birth and emergency cesarean sections has been supported in some studies (Handelzalts et al., 2015; Laursen, Johansen, & Hedegaard, 2009; Sydsjö et al., 2013), while not in others (Jespersen, Heggaard, Schroll, Rosthøj, & Kjærgaard, 2015; Larsson et al., 2015; Waldenstroem et al., 2006). In one study, instrumental birth has been found to correlate with fear of birth (Handelzalts et al., 2015), although other studies have failed to find such an association (Johnson & Slade, 2002; Larsson et al., 2015; Sydsjö et al., 2013).

Since a cesarean section is a surgical procedure, this also brings about additional risks. The risk of maternal bleeding and infections is more than twice as high in women undergoing a cesarean section without medical
indication when compared to women with a spontaneous vaginal birth (Karlström, Lindgren, & Hildingsson, 2013). Breastfeeding complications have been shown to be more than six times as common, and significant increases in both the risk of respiratory complications and hypoglycemia on behalf of the child have also been seen (Karlström et al., 2013). However, the most devastating risk is probably the risk of uterine rupture in a subsequent pregnancy, at worst leading to maternal and/or fetal death (Chibber, El-Saleh, Al Fadhli, Al Jassar, & Al Harmi, 2010).

Irrespective of mode of birth, women experiencing high levels of fear of birth are also more likely to have a negative birth experience (Elvander, Cnattingius, & Kjerulff, 2013; Handelzalts et al., 2015; Larsson et al., 2015). Even when giving birth vaginally without instrumental aids, the risk of having a negative birth experience is five times higher for women with high levels of fear compared to women with low levels. Approximately the same figures have been shown for both planned and unplanned cesarean sections and instrumental vaginal births, when comparing women with the same mode of birth but different levels of fear, in the third trimester of pregnancy (Elvander et al., 2013).

Although fear of birth may complicate childbirth for the mother, direct negative consequences for the expected child (e.g. fetal distress) are generally not shown (Handelzalts et al., 2015; Laursen et al., 2009; Ryding et al., 2015). In fact, a large Finnish cohort study monitoring almost 800,000 singleton births, found fear of birth (identified by the ICD-10 code O99.80) to be associated with lower incidence of low birthweight (< 2500 g), small for gestational age babies, preterm birth, low Apgar scores at 1 minute, stillbirth and early neonatal death (Räisänen et al., 2014).

Fear of birth during pregnancy may also have an impact on the wellbeing of mothers in the postpartum period. It has been shown to predict unfavorable psychological status following childbirth (Sieber, Germann, Barbir, & Ehlert, 2006) and postpartum depression among first time mothers (Pazzagli et al., 2015). In a recent meta-analysis, fear of birth was one of the most important risk factors for postpartum PTSD (Ayers, Bond, Bertullies, & Wijma, 2016). It has also been found to predict traumatic distress symptoms following an emergency cesarean section (Wijma et al., 2002). However, there are also contradictory results, indicating that fear of birth does not predict either depression or PTSD symptoms after birth (Fairbrother & Woody, 2007).

Finally, fear of birth has been associated with increased health care costs. When comparing women with severe and low fear of birth, women in the high fear group had more health care visits due to psychological reasons and
less normal vaginal deliveries. They also had more hours of sick leave during pregnancy, stayed longer on the maternity ward, and had more postpartum visits, both to the maternity clinic and to the antenatal care unit. In all, the mean cost of the perinatal health consumption in this group was 38% higher than the corresponding cost for women with low levels of fear of birth (Nieminen et al., 2017).

Treating fear of birth

A handful of studies have evaluated or compared different intervention models for fear of birth, and in the past two years there have also been efforts made to summarize the findings. This, however, is not an easy task. The number of treatment studies is limited, and there is great diversity in the definitions and measurements of fear of birth, inclusion criteria (e.g. fear sample or general pregnant sample), in the interventions tested, and in the use of control conditions. In the studies that have control conditions, most compare the active treatment with standard care. However, around the globe there are great differences in what standard care means, and as with the Swedish standard care for fear of birth, the exact care offered may also vary across regions or hospitals (Larsson et al., 2016).

In a recent systematic review of psychological treatments for clinical anxiety during the perinatal period (Loughnan et al., 2018), one study relevant to fear of birth was included and described. This study (Nieminen, Andersson, Wijma, Ryding, & Wijma, 2016), that reported findings from a feasibility testing of an Internet-delivered cognitive behavioral program, was not included in any of the two systematic reviews of treatments for fear of birth and pregnancy-specific anxiety published last year (MoghaddamHosseini, Nazarzadeh, & Jahanfar, 2018; Stoll, Swift, Fairbrother, Nethery, & Janssen, 2018). In these reviews, including ten and seven studies respectively, only three studies overlapped. Hence, it is not only difficult to draw conclusions from studies evaluating treatments for fear of birth, differences with regard to study design also raise questions relating to the relevance of published findings.

In trying to summarize previous findings, Stoll et al. (2018) found in their review that five out of seven nonpharmacological intervention studies reported significant changes in fear of birth or pregnancy-specific anxiety. In the meta-analysis conducted by MoghaddamHosseini et al. (2018), the authors report a pooled effect size of Cohen’s $d = -0.46$, 95% CI [-0.93, -0.30] for eight studies evaluating different educational interventions, and $d = 0.22$, 95% CI [-0.34, -0.10] for two studies testing out hypnosis.
Among the specific treatment protocols investigated, some interventions are framed as psycho-educative (Fenwick et al., 2013; Salmela-Aro et al., 2012), while others focus on relaxation training (Rouhe et al., 2013; Saisto, Toivanen, Salmela-Aro, & Halmesmäki, 2006), or physical exercise (Guszkowska, 2014). There are also examples of mindfulness-based childbirth education (Byrne, Hauck, Fisher, Bayes, & Schutze, 2015), haptotherapy (Klabbers, Wijma, Paarlberg, Emons, & Vingerhoets, 2014) and spiritually based mantra interventions (Hunter et al., 2011). A few interventions have a psychodynamic approach (Saisto et al., 2006; Sjögren, 1998) and interventions building on cognitive behavior therapy (CBT) are also starting to emerge (Nieminen et al., 2016).

To date, there is some evidence indicating that different forms of counseling (e.g. psychosomatic support or crisis-oriented counseling), and psycho-educative group sessions with relaxation training, may reduce the wish for cesarean births among women with severe fear of birth (Nerum et al., 2006; Rouhe et al., 2013; Sjögren & Thomassen, 1997). Compared to standard care alone, psycho-educative group sessions with relaxation training have also been found more effective than conventional care in enhancing women’s birth experiences, and reducing levels of postpartum depression (Rouhe et al., 2013; Rouhe et al., 2015). In a similar vein, individual telephone counseling with a midwife has been found to be slightly more effective than standard care in reducing fear of birth (Toohill, Fenwick, Gamble, Creedy, et al., 2014). The effectiveness of cognitive behavior therapy for fear of birth is under investigation. To date, one Internet provided CBT program has been found feasible for treating severe fear of birth in primiparous women (Nieminen et al., 2016). However, the efficacy of the program has not been compared with other interventions.

Despite these results, intervention studies are few, and the treatments evaluated are far from perfect in their effect. With no clear definition of a condition that is to be treated, and even less knowledge regarding the mechanisms underpinning it, the theoretical foundation on which to build interventions is not very stable. In order to deepen our understanding of fear of birth, we need to explore the phenomenon from new angles. Although fear of birth is clearly related to emotional experiences such as fear and anxiety, there is a remarkable lack of psychological theory in the fear of birth literature. Within the field of psychology, decades of research have contributed to a better understanding of emotional processes, such as fear and anxiety. It seems likely, that this knowledge may also be useful in widening our perceptions of fear of birth.
Psychological perspectives on fear and anxiety

Emotion

The concept of emotion has been difficult to define scientifically. Despite a long tradition of intensive research, there is still no consensus on the topic. Over the years, several theoretical frameworks have been developed, and current versions of these are still debated among emotion researchers. While some theorists state that basic human emotions with prototypic expressions are automatically triggered by certain eliciting events, others argue that emotional experiences are constructed based on situational and sociocultural factors, or that the appraisal of an eliciting event with regard to the individual’s well-being and goal achievement has central meaning for the emotional experience (Scherer, 2009). Despite their differences, modern theories of emotion are often integrative in nature, presuming the emotional experience to be dependent on the interaction of neurobiological, cognitive and behavioral response systems (Barlow, 2002).

For most individuals, emotional experiences are natural parts of everyday life. We act, we think, and we feel. As long as our emotional experiences are positive we endorse them, but as soon as they become unpleasant, we commonly wish for the emotion to fade away. This simple distinction between pleasant (appetitive) and unpleasant (aversive) emotions also seems to reflect the basic neural organization of our emotional networks – an organization that has been shaped by thousands of years of evolution (Lang & Bradley, 2010; Lang, Bradley, & Cuthbert, 1998). If approaching emotional experiences from an evolutionary perspective, the general function of emotional responses (both the pleasant and the unpleasant ones) would be to enhance the chances of species survival (Barlow, 2002; Fox, 2008). Although negative emotions can be very unpleasant, they are highly useful in the context of threat. Positive emotions might, instead, be more useful in situations characterized by safety. The usefulness of an emotional response is thus dependent on its context (Nesse, 2009).

Fear and anxiety – similar yet distinctive emotional states

Fear and anxiety are both aversive emotional states, evoked in the presence of stimuli relating to threat (Öhman, 2008). Although some important differences between the concepts are commonly emphasized, the distinction of these emotional states is far from clear-cut and more work is needed in order to clearly distinguish these concepts (LaBar, 2016).
Fear is understood to be a primitive alarm response, elicited in situations of immediate danger, and associated with strong physiological arousal and the defensive actions of fight or flight. Fear is typically conceptualized as the response to a specific, easily identifiable eliciting stimulus, and the intensive fear response generally subsides quickly upon termination of that particular stimulus (Barlow, 2002; LaBar, 2016; Lang, Davis, & Öhman, 2000; Öhman, 2008).

Anxiety has instead been described as a state of unease oriented towards potentially threatening events and negative outcomes in the future (LaBar, 2016). As such, the function of anxious apprehension is rather to make us prepared to detect and avoid possible upcoming negative events (Barlow, 2002). The eliciting (and terminating) stimuli of anxious responses are commonly viewed as less explicit or more generalized than fear stimuli, and the anxious response as a more long lasting, general state of distress (LaBar, 2016; Lang et al., 2000).

So, while fear is the reaction to an acute threat in the present surrounding, the threats giving rise to anxiety are future-oriented, with the outcome often being uncertain, unpredictable, or uncontrollable (Barlow, 2002; Lake & LaBar, 2011). In the words of Öhman (2000, 2008), fear could be described as a “poststimulus” response, while anxiety is something that occurs “prestimulus”. This distinction is also evident in the Research Domain Criteria (RDoC), where fear corresponds to the negative valence system of acute threat, while anxiety corresponds to the negative valence system of potential threat (Morris & Cuthbert, 2012).

While fear and anxiety can be described as emotional processes, the closely linked concept of worry, is held to be a thought process. It has been described as the cognitive component of anxiety, but this definition in turn has been found to be too imprecise to fully capture the concept (Borkovec, 1985; Mathews, 1990). When defined in more detail, worry is said to be a chain of relatively uncontrollable thoughts, that often are associated with negative affect (Borkovec, Robinson, Pruzinsky, & DePree, 1983). These thoughts are predominantly verbal in nature, and function as an attempt to avoid future aversive events (Borkovec, 1994). Even though worry does not always lead to a satisfactory outcome, the action of worrying may still be perceived as helpful, motivating further cognitive activity of this kind. Worry may be positively reinforced by the occasional perception of success in problem solving, and negatively reinforced by the perception of non-occurrence of the feared outcome (Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1994). Worry is also suggested to be negatively reinforced by cognitive avoidance of
the full elaboration of threatening stimuli, and an associated dampening of physiological aspects of fear and anxiety (Borkovec, 1994).

**Clinical manifestations of fear, anxiety, and worry**

Clinical manifestations of fear, anxiety and worry differ from their non-clinical counterparts by their persistency and excessiveness (American Psychiatric Association, 2013; Öhman, 2008). That is, the emotional response of fear or anxiety is excessive or unreasonably intense given the objective danger of the situation, and the individual does not have the capacity to cope with the situation effectively.

No less than ten specific anxiety disorders, and several other disorders with apparent features of fear or anxiety, are presented in DSM-5 (American Psychiatric Association, 2013). The anxiety diagnoses are differentiated by the type of stimuli (objects or situations) that induce anxiety, and the cognitive ideation associated with these stimuli. The presentation of fear and anxiety may be either uniquely associated with a specific stimulus, as in specific phobias, or generalized in character, as in generalized anxiety disorder. Fear and anxiety are also associated with significant distress or impairments in social, occupational or other important areas of functioning (American Psychiatric Association, 2013). Anxiety disorders are highly comorbid. For example, Brown, Campbell, Lehman, Grisham, and Mancill (2001) found that, for patients with a principal anxiety disorder, the current comorbidity with another anxiety or mood disorder ranged between 33% and 65%, and the corresponding lifetime prevalence was 56 - 88%.

Although the clinical diagnoses are framed in terms of anxiety, both worry and fear can be central parts of the presentation. While worry is the main feature of generalized anxiety disorder, it may contribute significantly to the maintenance of anxiety in general, regardless of diagnostic category (Borkovec, 1994). With regard to fear, the terms fear and anxiety are used in combination in the DSM-5 diagnostic criteria, often also including avoidance (which is the most common behavioral manifestation of fear and anxiety). Along with the responses of phobic patients when encountering their phobic stimuli, panic attacks, which may occur in many anxiety disorders as well as in other mental disorders, are held to be the most evident clinical manifestations of fear as a basic emotion (American Psychiatric Association, 2013; Barlow, 2002). However, further theoretical clarification of the relative contribution of fear and anxiety to all of the anxiety disorders has been recommended (LaBar, 2016).
Decades of psychological research have contributed to our knowledge about anxiety disorders. Great efforts have resulted in psychological models attempting to describe the etiology and maintenance of each disorder (Clark, 1986; Clark & Wells, 1995; Dugas, Gagnon, Ladouceur, & Freeston, 1998; Foa & Rothbaum, 1998; Öst, Hellström, & Kåver, 1992). In line with contemporary integrative models of emotion, these psychological models often comprise the interaction of physiological, cognitive and behavioral aspects.

**Etiology of clinical anxiety: the interaction of vulnerabilities and stress**

The etiology of clinical anxiety is commonly described by diathesis-stress models, emphasizing the interaction between vulnerability factors and specific life events (Ingram & Luxton, 2005).

From a vulnerability-stress perspective, “anxiety disorders are believed to be caused by multiple nonspecific and specific biological and psychological vulnerabilities that are in a continuous state of reciprocal interaction both with themselves and with environmental contingencies” (Williams, Reardon, Murray, & Cole, 2005, p. 315). These authors further emphasize the necessity to acknowledge the multiple pathways by which vulnerabilities may lead to the development of anxiety disorders, along with the protective factors relevant for each individual.

In a conceptual model summarizing the collective knowledge of vulnerability factors, Barlow (2002) presents the contribution of three synergistic vulnerabilities in the development of anxiety disorders (and related emotional disorders): generalized biological vulnerability, generalized psychological vulnerability, and specific psychological vulnerability. The first of these constitutes the genetic contribution to emotional disorders. Although some specific features of anxiety (e.g. responding to stress by panic attacks) may be related to unique genetic components, a great deal of the genetic basis of anxiety and related emotional disorders seem to be shared. The second of the three vulnerabilities, generalized psychological vulnerability, relates to early experiences in life – often (but not exclusively) in interactions with caregivers. Early experiences of unpredictability and uncontrollability, are thought to lead to low perceptions of control, which lie at the core of the generalized psychological vulnerability. The third part of the triple vulnerabilities model, is the set of specific psychological vulnerabilities focusing anxiety on some specific event or object. None of the three vulnerability factors is presented as likely to cause clinical anxiety in isolation, but the synergetic effect of two or three of them, may contribute to the development of emotional disorders (Barlow, 2002).
Fear and anxiety as learned responses: pathways of acquisition

Despite the evolutionary importance of fear and anxiety for the survival of the human species, fears do not seem to be congenital, but acquired. Three major pathways to the acquisition of fear have been suggested (Rachman, 1977). The most well-studied of these, classical conditioning, is when fear or anxiety is learned by a direct encounter in which a neutral stimulus is associated with an aversive stimulus. This form of learning can take place both when experiencing an actual threat, and in situations that do not constitute an impeding real life threat or danger, but were spontaneous experiences of intensive fear (Barlow, 2002). It is important to notice that conditioning of this kind does not require conscious processing (Öhman, 2008). Hence, conditioning might have taken place, even if the individual cannot remember or report it. Fear and anxiety acquired through conditioning may also generalize to objects, situations or physiological experiences similar to those that were first conditioned (Bouton, 2007).

Besides the direct acquisition of fear or anxiety through conditioning, fear or anxiety may also be acquired indirectly; either vicariously (by observational learning) or by transmission of information (Bandura, 1977; Rachman, 1977). As Barlow (2002, p. 408) puts it:

“On rare occasions, strong learned (mis)information could be sufficient to trigger a phobia in the context of preexisting biological and psychological vulnerabilities. /.../ Of course, one would expect that the intense anxiety and vigilance of someone repeatedly warned of the dangers of an object or situation will eventually lead to a full-blown alarm or panic when and if the person finally confronts the object or situation. Of course, a sense of unpredictability and uncontrollability of negative events, existing as psychological vulnerability, may set the occasion for the above-described chain of events leading to the development of a phobia.”

In the past decades, Relational Frame Theory (RFT) has offered new insights about learning that occurs in the absence of direct experiences (Hayes, Barnes-Holmes, & Roche, 2001; Torneke, 2010). Human language gives us the opportunity to relate different stimuli to each other, and to derive associations verbally. Such derived relations between stimuli will also affect the meaning we give to these stimuli and how they will affect us. Within RFT, this is called a transformation of stimulus functions (Torneke, 2010), and is understood to be one of the ways in which we might acquire fear or anxiety.
A transdiagnostic perspective on fear and anxiety

During the past 15-20 years, increasing attention has been directed towards the limitations of a disorder focused perspective on mental disorders, as represented, for example, in DSM-5 (American Psychiatric Association, 2013). Common critiques focus on the high comorbidity between disorders, similarities across disorders with regard to etiology and underlying biology, heterogeneity within disorders, and the fact that important patient information will get lost when not fitting into a particular diagnostic category (Meidlinger & Hope, 2017; Watkins, 2015).

As an alternative, a transdiagnostic approach to psychological suffering was first suggested by Harvey, Watkins, Mansell, and Shafran (2004). In the transdiagnostic perspective, the focus is shifted from the categorization of symptoms into diagnostic entities, to mechanisms that are shared across disorders, and that ideally can be related to mental disorders by a causal relationship (Harvey, Murray, Chandler, & Soehner, 2011). These mechanisms, or transdiagnostic processes, refer to aspects of cognition or behavior that may contribute to the maintenance of psychological disorders (Harvey et al., 2004).

A large number of potentially transdiagnostic psychological processes have been suggested, spanning the domains of attention, memory, thinking, reasoning and behavior (Mansell, Harvey, Watkins, & Shafran, 2008). No consensus has been reached regarding which processes should be viewed as transdiagnostic, or whether the processes themselves are distinct or reflect a shared core process (Mansell & McEvoy, 2017). Among the commonly suggested transdiagnostic processes, we find selective attention or vigilance to external and internal stimuli, selective memory, biases in reasoning, repetitive negative thinking, positive and negative metacognitions, overt avoidance, and safety behaviors (Harvey et al., 2004; Mansell et al., 2008; Watkins, 2015). The concepts intolerance of uncertainty (Carleton et al., 2012; Gentes & Ruscio, 2011; McEvoy & Mahoney, 2012) and catastrophizing (Gellaty & Beck, 2016) have also been proposed as transdiagnostic.

Treating fear and anxiety using Cognitive Behavior Therapy

Cognitive behavior therapy (CBT) is a general term, comprising a wide range of interventions aimed at improving mental health. The theories and principles of CBT are based on empirical research, mainly from behavioral and cognitive psychology. Interventions may be more oriented towards cognitive or behavioral approaches but share the perception of an important
interplay between human cognitions, behaviors and emotions. In essence, CBT is based on the assumption that maladaptive behaviors and/or dysfunctional cognitions have a central role in the maintenance of negative emotions and psychological disorders. The choice of specific interventions is guided by an individual analysis of such maintaining factors, building on the idea that clinical symptoms and negative emotional experiences can be reduced by learning and applying more adaptive cognitive and behavioral strategies.

To date, CBT has proven effective in treating a wide range of anxiety disorders (Butler, Chapman, Forman, & Beck, 2006; Hofmann & Smits, 2008; Norton & Price, 2007; Stewart & Chambless, 2009) and it is the treatment of choice for common disorders relating to anxiety, trauma and stress (National Institute for Heath and Care Excellence 2013; 2014a; National Institute for Health and Clinical Excellence, 2005a; 2005b; 2011). CBT is also recommended for treating mental health problems in pregnancy and the postnatal period (National Institute for Health and Care Excellence, 2014b).

Interventions that come under the CBT umbrella are in constant development. During the past two decades, there has been an increasing focus on distributing CBT over the Internet (Andersson, 2018), and the evidence for Internet interventions is rapidly growing. Typically, such interventions could be described as self-help programs, guided and supported online by an identified therapist (Andersson et al., 2008). Guided Internet-delivered self-help programs (guided ICBT) have been found efficacious in treating anxiety disorders (Andersson, Carlbring, Ljótsson, & Hedman, 2013; Spek et al., 2007). Although some still find the evidence inconclusive (Arnberg, Linton, Hultcrantz, Heintz, & Jonsson, 2014), and while more research is needed to conclude equivalence with regard to individual psychiatric and somatic conditions, the overall effect of guided ICBT has been found equivalent with face-to-face CBT for psychiatric and somatic conditions (Andrews et al., 2018; Carlbring, Andersson, Cuijpers, Riper, & Hedman-Lagerlof, 2018). Overall, guided ICBT also seems to be well accepted by patients (Andersson et al., 2013; Andrews et al., 2018), and has been suggested as advantageous with regard to patients’ access to treatment, the amount of therapist time required, and its cost-effectiveness (Andersson & Titov, 2014).

Along with the growing interest in transdiagnostic perspectives on emotional disorders, there has also been an increasing focus on transdiagnostic treatment protocols. A number of different treatment protocols have been developed and tested. These may be described and categorized in different ways (Clark, 2009; Meidlinger & Hope, 2017; Sauer-
Zavala et al., 2017), commonly distinguishing between integrative programs that build on a mix of existing disorder-specific treatment programs, and programs building on the idea of mechanistically transdiagnostic processes. Despite their differences, the core components across most transdiagnostic treatments (and most diagnosis-specific CBT treatments) aim to decrease behavioral and experiential avoidance, and commonly also to introduce and apply emotion-regulation strategies, such as cognitive restructuring or mindfulness (Meidlinger & Hope, 2017). Overall, transdiagnostic CBT treatment protocols have been shown to be as efficacious as diagnosis-specific interventions in treating anxiety disorders (Pearl & Norton, 2017).

One of the most well-known transdiagnostic treatment manuals is the Unified Protocol for Transdiagnostic Treatment of Emotional Disorders (UP; Barlow, 2011; Ellard, Fairholme, Boisseau, Farchione, & Barlow, 2010). This is a broad face-to-face CBT protocol, designed to be applicable to all anxiety and unipolar mood disorders. The UP has performed favorably in initial studies, showing significant reductions in diagnostic-specific outcomes in principal and comorbid anxiety diagnoses, both in open (Ellard et al., 2010; Ornelas Maia, Braga, Nunes, Nardi, & Silva, 2013) and randomized trials (Farchione et al., 2012). Patient credibility ratings of the UP are in line with ratings previously reported for other CBT protocols (Thompson-Hollands, Bentley, Gallagher, Boswell, & Barlow, 2014).

Summary and rationale

For the most part, previous research on fear of birth has had a medical perspective, investigating risk factors and consequences of this form of fear or anxiety. Theory-building research, aiming to investigate possible mechanisms of importance for the development and maintenance of fear of birth is difficult to find. Hence, approaching fear of birth from this perspective has the potential of contributing to a deepened theoretical understanding of this form of fear or anxiety, but may also have immediate clinical bearing on the development of empirically and theoretically grounded methods for assessment and intervention.
2 Aim

The initial aim of this thesis was to develop and evaluate different treatment models for fear of birth. While working on the first study, aiming to evaluate the effect of an Internet-delivered self-help program building on CBT, the overarching aim of the thesis shifted. From then on, the overarching aim has been to explore the role of psychological factors in fear of birth. The idea was to first review existing knowledge from a psychological perspective, and to let the findings in the literature review guide the future direction of the thesis. As it turned out, the general aim of exploring psychological factors in fear of birth, was focused on investigating potential mechanisms contributing to this form or fear of anxiety, and the possibility of heterogeneity among women fearing birth. The specific aims of the four studies are described below.

The specific aim of Study 1 was to evaluate the efficacy of a guided Internet-delivered self-help program based on CBT, compared with standard care, on levels of fear of birth in late pregnancy and one year after birth, in a Swedish sample of primiparous and multiparous women reporting clinically significant levels of fear of birth.

The specific aim of Study 2 was to review the existing scientific literature on fear of birth from a psychological perspective, giving an overview and critical evaluation of the current knowledge regarding the specificity of the syndrome, the pathways of fear acquisition, and the physiological, cognitive, and behavioral aspects of this form of anxiety.

The specific aim of Study 3 was to describe the psychological characteristics of a sample of pregnant women reporting fear of birth, and explore the heterogeneity within the group with regard to: (a) differences between primiparous and multiparous women and, (b) possible subgroups based on the psychological profiles of the included women.

The specific aim of Study 4 was to take a first step in trying to identify psychological mechanisms relevant to the understanding of fear of birth, beginning with investigating the extent to which pain catastrophizing, intolerance of uncertainty, positive beliefs about worry, and cognitive avoidance could predict fear of birth in a general pregnant population.
3 Methods

The four studies in this thesis build on data from three different projects: the U-CARE Pregnancy trial (Ternström et al., 2017), a literature review, and a project called Childbirth Related Fear and Worry During Pregnancy. An overview of the study methods is presented in Table 1.

Table 1: Methodological overview of studies included in the thesis

<table>
<thead>
<tr>
<th>Study</th>
<th>Project</th>
<th>Design</th>
<th>Participants</th>
<th>Data collection</th>
<th>Main analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>U-CARE Pregnancy trial</td>
<td>Randomized controlled trial</td>
<td>258 pregnant women reporting fear of birth</td>
<td>Online and paper questionnaires</td>
<td>Linear mixed model analysis</td>
</tr>
<tr>
<td>2</td>
<td>Literature review</td>
<td>Narrative literature review</td>
<td>89 original research papers</td>
<td>Systematic literature search</td>
<td>Frequencies</td>
</tr>
<tr>
<td>3</td>
<td>U-CARE Pregnancy trial</td>
<td>Cross-sectional observational study</td>
<td>206 pregnant women reporting fear of birth at two occasions</td>
<td>Online questionnaires</td>
<td>Hierarchical and non-hierarchical cluster analysis</td>
</tr>
<tr>
<td>4</td>
<td>Childbirth Related Fear and Worry During Pregnancy</td>
<td>Cross-sectional observational study</td>
<td>499 pregnant women</td>
<td>Paper questionnaire</td>
<td>Linear and logistic regression analysis</td>
</tr>
</tbody>
</table>

The studies in this thesis make use of three different designs; a randomized controlled trial (RCT; Study 1), a narrative literature review (Study 2), and two cross-sectional observational studies (Studies 3 and 4).

Apart from the literature review, all studies were conducted, at least in part, within standard antenatal care. The participants in these studies were all pregnant women, recruited at the ultrasound screening examination in pregnancy week 17-20 or at the first visit to the antenatal midwife following this screening. In all of these studies, an ultrasound screening examination with no reported adverse findings, as well as mastery of the Swedish language, were the first inclusion criteria. In Studies 1 and 3, women also needed to report high levels of fear of birth to be included.

When measuring fear of birth, the Fear of Birth Scale (FOBS) was used (Haines et al., 2011; Hildingsson et al., 2017). This scale has been used both as
a continuous measure of fear levels, and dichotomized to indicate high levels of fear of birth.

All statistical analyses were conducted using IBM SPSS Statistics 24. Due to non-normal distributions, non-parametric tests were used for correlational analyses and comparisons between groups. In all statistical analyses, the significance level was set at $p < .05$.

Study 1

Interdisciplinary research setting

The U-CARE Pregnancy trial was conducted by an interdisciplinary research team. The trial was associated with the Uppsala University Psychosocial Care Program (U-CARE), an eHealth service with the aim of supporting randomized controlled trials on Internet-based interventions aimed at preventing and reducing emotional distress in patients with somatic disease (Sjöström, von Essen, & Grönqvist, 2014).

When I joined the research team, the overall study protocol and timing of the study was set. Initially, my role was to be active in the team of psychologists that planned and developed the Internet-delivered CBT intervention. I was also one of the two psychologists giving therapist support to participants in this treatment arm.

Within the U-CARE Pregnancy trial, large amounts of data were gathered, and decisions on how to best make use of these data were made by the principal investigator and the senior research associates, after discussion with the research team. With the study described below, the intention was to report the primary outcome of the trial, i.e. changes in fear of birth during pregnancy, according to an intention-to-treat principle. Data analyses and drafting of the manuscript was conducted by the first two authors, Elin Ternström and myself, and the study is included in both our theses (see Ternström, 2018).

Study design and setting

Study 1 presents the primary outcome of the U-CARE Pregnancy trial (Ternström et al., 2017), a prospective multi-center RCT, comparing the efficacy of a guided Internet-based self-help program based on cognitive behavior therapy (guided ICBT) and standard care for the treatment of fear of birth. In the trial, recruitment and standard care interventions were conducted within the standard and specialized antenatal care at three study centers - one university hospital and two referral hospitals in Sweden.
Participants and procedures

In the U-CARE Pregnancy trial, we sought to include pregnant women reporting clinically relevant levels of fear of birth. Hence, in this project, the initial step of recruitment was to screen for fear of birth. Since taking part in the intervention demanded access to a computer with Internet connection and a mobile phone, these prerequisites were also necessary for inclusion. In the next step of recruitment, two research midwives telephoned all 864 women (19.2%) who fulfilled the inclusion criteria of clinically relevant levels of fear of birth, in this case defined as a score of 60 or above on the Fear of Birth Scale (FOBS; Haines et al., 2011; Hildingsson et al., 2017; Ternström et al., 2015). The women that fulfilled all inclusion criteria and gave their oral consent to participate, were sent a consent form by mail. When this written consent was returned, each woman was given access to the study specific website, the U-CARE portal, where she completed the online pre-intervention questionnaire and was randomized, to either guided ICBT or standard care for fear of birth. The full CONSORT flow diagram of the U-CARE Pregnancy trial is presented in Figure 1. Since Study 1 was an intention-to-treat study, the participants of this study were all women included in the U-CARE Pregnancy trial (n = 258).

Randomization, data collection and implementation of the guided ICBT intervention, were all carried out using a study specific website, called the U-CARE portal (https://www.u-care.se/). The 1:1 randomization was automatic, with no involvement of the researchers, and resulted in 127 women randomized to guided ICBT and 131 to standard care for fear of birth. In the same process, participants randomized to guided ICBT were also randomized to one of two licensed clinical psychologists guiding them through the self-help program.

Following the screening procedure in pregnancy week 17-20, data were collected at five time points: (1) before randomization (pre-intervention) in pregnancy week 20-25, (2) in pregnancy week 30, (3) in pregnancy week 36, (4) two months after birth, and (5) one year after birth. At all time points, data were collected using the U-CARE portal. Reminders, in the form of e-mails and text messages, were sent to each participant on several occasions after the start of each time point. To optimize the response rate, additional data were gathered over the phone, at two months after birth, and by paper questionnaires at one year after birth. Due to large amounts of missing data (see the CONSORT flow diagram in Figure 1 for details), data from pregnancy week 30 and 36 were combined using last observation carried forward, and data from two months after birth were omitted in Study 1. Participants who
did not respond, both at post-intervention nor follow-up, were defined as lost to follow-up.

**Measurements**

The pre-intervention questionnaire included sociodemographic details (age, civil status, country of birth, education, and occupational status), self-reports of previous or current mental disorders (depression, anxiety, bipolar disorder, eating disorder, and other mental disorder), self-reports relating to obstetric history (e.g., if they had given birth before, including mode of birth and year) and an open-ended question regarding previous negative experiences in health care.

The primary outcome in this study was fear of birth, as measured continuously using the FOBS (Haines et al., 2011; Hildingsson et al., 2017). In this scale, the question “How do you feel right now about the approaching birth?” (or “How do you feel right now when thinking about giving birth again?” if asking after birth), is to be answered using two 100 mm visual analogue scales, with the anchors (a) “calm” and “worried”, and (b) “no fear” and “strong fear”. The two ratings are combined using the mean, giving the scale a range of 0-100, with higher scores indicating higher levels of fear. A FOBS score of 60 or above was used to identify fear of birth at screening (Hildingsson et al., 2017; Ternström et al., 2015). FOBS has previously shown good internal consistency and construct validity, and has been suggested as a valid instrument for measuring fear of birth, both in research and in the clinical context (Haines et al., 2015; Haines et al., 2011; Hildingsson et al., 2017; Ternström et al., 2015). In this study, Cronbach’s alpha was .93 at screening.
Figure 1. CONSORT flow-diagram of Study 1.
**Guided ICBT**

The guided ICBT program was delivered via the U-CARE portal, a secure online platform using double verification for logging in. After being randomized to guided ICBT, the psychologist responsible for each participant sent a brief text message to her phone, asking her to log in to the portal, where she could find a general welcome message. Participants who did not log in to the portal received reminders via mobile phone text messages. The minimum frequency of reminders was at 10 days and 4 weeks after randomization or last login. About halfway through the project, the psychologists started to call each participant randomized to guided ICBT, in order to optimize adherence and motivation. In total, 37 participants talked with their psychologist on the phone, while 15 did not respond despite several calls.

The guided self-help program was based on the principles of CBT, and aimed at helping the participants observe and understand their fear of birth, and find new ways of coping with difficult thoughts and emotions. The intervention was inspired by the Unified Protocol for Transdiagnostic Treatment of Emotional Disorders (Barlow, 2011; Ellard et al., 2010). However, it was adapted for this particular group, and with a defusion perspective (Hayes, Strosahl, & Wilson, 2012) replacing cognitive restructuring.

The self-help material was divided into eight treatment modules during pregnancy, and one module for postpartum follow-up. An overview of the treatment modules is presented in Table 2. The participants were requested to complete one self-help module per week. All modules included short informative texts and examples, as well as one to three exercises. Including the exercises, the text material was presented on 81 downloadable pdf pages. The self-help material also included audio files with recorded exercises and birth-related photographs. The participants reported the exercises online, using the U-CARE portal. On completion of the assignments, participants received personalized written feedback and were given access to the next self-help module. The participants could also contact their psychologist using a text message function within the portal. The psychologists were active in the portal at least three times a week, giving feedback to homework assignments, sending reminders, and answering text messages from the participants.
<table>
<thead>
<tr>
<th>Module</th>
<th>Content and Assignments</th>
</tr>
</thead>
</table>
| 1      | Introduction and motivation enhancement  
- Introduction to the program  
- Understanding fear and anxiety  
- Motivation and behavioral change  
- Assignment: Setting individual treatment goals |
| 2      | Emotion  
- The function of emotion  
- Physiological, cognitive and behavioral aspects of emotion  
- Assignment: Self-monitoring of emotional reactions |
| 3      | Behavior  
- Learned and emotion-driven behaviors  
- Avoidance and negative reinforcement  
- Assignment: Self-monitoring of emotion-driven behaviors and avoidance behaviors |
| 4      | Cognition  
- Automatic appraisals and catastrophizing  
- Viewing cognitions as merely cognitions: working with cognitive defusion  
- Assignment: Identification of childbirth-related catastrophic cognitions  
- Assignment: Cognitive defusion exercises |
| 5      | Mindfulness and Acceptance  
- Nonjudgmental present-moment awareness  
- Acceptance in relation to pregnancy and childbirth  
- Assignment: Guided present-focused awareness  
- Assignment: Anchoring in the present  
- Assignment: Identifying childbirth- or pregnancy-related areas in need of acceptance |
| 6      | Exposure, Part I  
- The purpose and value of exposure-based interventions  
- Different forms of exposure: situational, imaginative and interoceptive  
- Assignment: Generating a personalized avoidance hierarchy for emotional exposure |
| 7      | Exposure, Part II  
- Planning and implementation of exposure-based interventions  
- Assignment: Exposure to images relating to childbirth  
- Assignment: Exposure to avoided situations in accordance with personal hierarchy |
8 Generalization and Maintenance
- Progress and acquired skills: a summary of the program
- Maintenance, relapse prevention and further development
- Assignment: Evaluation of personal progress and acquired skills
- Assignment: Creating a plan for maintenance and future development

9 Postpartum follow-up
- Childbirth in retrospect: the unique experience of each childbirth
- Generalizing acquired skills to other areas of life
- Assignment: Reviewing the birth experience: cognitions, emotions, and strategies
- Assignment: Exposure to images relating to childbirth
- Assignment: How can acquired skills be generalized to other areas of life?

Standard care
In this study, standard care was defined as the Swedish standard care for fear of birth, i.e., midwife-led fear of birth specific counseling as an extension to standard antenatal care. All study centers offered fear of birth specific counseling in line with the guidelines of the Swedish Society of Obstetrics and Gynecology (Björklund et al., 2017). However, the number of sessions and the specific content of these may differ. As described by Larsson et al. (2016), common features of the counseling are: information about the birth process and different birth modes, promise of early pain relief, preparation of a written birth plan, and - when applicable - review of previous birth records. Depending on what study center the participant belonged to, standard care could be offered either directly by her antenatal midwife, or after referral to a counseling midwife or a psychosocial unit hosting midwives, obstetricians and psychologists. Information regarding the exact number of counseling sessions offered could not be obtained. However, the national mean number of sessions has been reported to vary between 2 and 3 (Larsson et al., 2016).

Data analysis
Linear Mixed Models analyses were used to analyze changes in levels of fear of birth over time, and if such changes could be attributed to treatment allocation, parity of the participants, or the interaction of both. In order to compare a series of nested models using the Likelihood Ratio Statistic, the maximum likelihood estimation was used (Gumedze & Dunne, 2011). Linear Mixed Models analysis has the advantage of making use of all available data, and produces unbiased parameter estimates under the assumption of data
being missing at random (Gueorguieva & Krystal, 2004; Lane, 2008; Verbeke & Molenberghs, 2000). Hence, Linear Mixed Models analysis is suitable for intention-to-treat analyses in longitudinal studies.

Between-group comparisons were conducted using the Mann-Whitney U test for continuous data and Pearson’s Chi-Square test for dichotomous data. Between- and within-group effect sizes (Cohen’s d) and their 95% confidence intervals were calculated based on both observed and estimated data. As suggested by Jacobson and Truax (1991), a cut-off point for clinically significant reduction in fear of birth was set at two standard deviations below the pre-intervention mean of the group. Differences in the rate of treatment responders between the intervention groups were compared using Pearson’s chi-square test.

Study 2
Design and setting

Study 2 was a narrative review of the existing literature describing fear of birth. A narrative review aims at summarizing what has previously been published with regard to a specific topic, without the strict requirements of a systematic review (Ferrari, 2015). The narrative literature review allows for a broader scope than a systematic review and is therefore valuable when wishing to link together many studies on different topics. Although not suitable for hypothesis testing, a narrative review may be valuable in attempts to interconnect or reinterpret previous findings, in theory building, and in hypothesis generation (Baumeister & Leary, 1997).

Participants and procedures

In Study 2, relevant articles published between the first of January 2000 and the 12th of August 2015 were identified using a computer-based literature search of the two databases Medline and Psychinfo, with the search string “childbirth AND (fear OR anxiety)” in any field. To be included an article had to be written in English and relate fear of birth to any other factor relevant for the understanding of the concept. Quantitative articles were included if they reported on relations with either antecedents (e.g. obstetric history and other background factors), consequences (e.g. mode of birth and birth outcomes) or correlates of fear (e.g. psychiatric symptoms and psychological traits). Qualitative descriptions of women’s experiences of fear of birth were also included. Of 639 records identified, 116 remained after screening of titles and abstracts, and 20 additional ones were included after screening of the 116
bibliographies. In the next step, 37 articles that did not have the intended focus were excluded, and in the last round of exclusion 10 articles that did not meet our quality criteria were excluded. The process of inclusion and exclusion of articles is presented in Figure 2.

None of the included studies were of experimental design. Seventy-two studies were quantitative (32 longitudinal, 33 cross-sectional, two register studies, and five case-control studies), 14 were qualitative, and three used mixed methods.

Figure 2. The process of inclusion and exclusion in Study 2.
Data analysis

The methodological approach of a narrative review is not restricted or detailed by specific criteria. In this particular study, the findings presented in the included articles were initially summarized inductively in rather narrow sub-categories, (e.g. fear of birth and trait anxiety, fear of birth and state anxiety, fear of birth and anxiety sensitivity, fear of birth and subsequent emergency cesarean section, fear of birth and subsequent planned cesarean section, fear of birth and subsequent negative birth experience etc.). Within these categories, the findings were summarized qualitatively and by reporting the frequency of articles investigating each topic. If possible, the findings were categorized as supporting a specific association or not. In a next step of analysis, these sub-categories were structured in five higher-order categories based on the aims of the study: (1) syndrome specificity, (2) pathways of fear acquisition, (3) physiological aspects, (4) cognitive aspects, and (5) behavioral aspects.

Study 3

Design and setting

Study 3 was part of the U-CARE Pregnancy trial (Ternström et al., 2017), described in Study 1. It was a cross-sectional observational study, using data from the pre-intervention questionnaires only.

Participants and procedures

The participants in this study were women recruited to the U-CARE Pregnancy trial (see Participants and Procedures for Study 1). In Study 3, we limited the sample to those women reporting fear of birth above the inclusion cut-off point (FOBS ≥ 60) not only at screening (pregnancy week 17-20) but also at pre-intervention (pregnancy week 20-25). As a result, 206 women were included in this selected sample.

Measurements

All measures used in this study were collected at pre-intervention (pregnancy weeks 20-25). Since this study was a part of the U-CARE Pregnancy trial, the sociodemographic, psychiatric and obstetric self-reports were the same as in Study 1.

Fear of birth was measured using FOBS (Haines et al., 2011; Hildingsson et al., 2017). For inclusion purposes, a cut-off point of FOBS ≥ 60 was used to
identify women with high levels of fear or birth (Hildingsson et al., 2017; Ternström et al., 2015). Fear of birth as a continuous measure was used as one of the independent variables when comparing the parity groups and for validation of the clusters. In this selected sample, Cronbach’s alpha was only .70.

*Pain catastrophizing* was measured using the Pain Catastrophizing Scale (PCS; Sullivan, Bishop, & Pivik, 1995). In this 13-item scale, the participants are asked to rate the extent to which they experience various thoughts and feelings in relation to actual and anticipated pain (e.g. “When I’m in pain I wonder whether something serious may happen”) on a 5-point Likert scale. In this study, PCS was used as one of the dependent variables when comparing the parity groups, and also included in the cluster variate.

*Performance Based Self-Esteem* (PBSE; Hallsten, Josephson, & Torgén, 2005) is a brief instrument, in which the four items “I think I sometimes try to prove my worth by being competent”, “My self-esteem is far too dependent on my daily achievements.”, “At times, I have to be better than others to be good enough myself.”, and “Occasionally I feel obsessed with accomplishing something of value.” are rated on a 5-point Likert scale. In this study, PBSE was included in the cluster variate, and used as one of the dependent variables when comparing the parity groups.

*Posttraumatic stress symptoms* were assessed using the PTSD Symptom Scale – Self-Report (PSS-SR; Foa, Riggs, Dancu, & Rothbaum, 1993; Hembree, Foa, & Feeny, 2002). This is a 17-item scale in which the frequency of posttraumatic stress symptoms during the past two weeks are rated on a 4-point scale. The items are clustered in three subscales, re-experiencing (e.g. “Having bad dreams or nightmares about the traumatic event”), avoidance (e.g. “Trying not to think or talk about the traumatic event”), and arousal (e.g. “Having trouble concentrating”). In this study, PSS-SR was included in the cluster variate, and used as one of the dependent variables when comparing the parity groups.

*Blood and injection phobic anxiety* was measured using the Injection and Phobia Scale – Anxiety (IPSA) and the Injection and Phobia Scale – Avoidance (IPSAV; Öst et al., 1992). In these scales, anxiety and avoidance of 18 injection situations (e.g. "Giving a blood sample by having a finger pricked." and "Getting a vaccination.") are rated on a 0-4 scale for anxiety (IPSA) and a 0-3 scale for avoidance (IPSAV). In this study, a compound of IPSA and IPSAV was included in the cluster variate, and both variables were used as dependent variables when comparing the parity groups.
Symptoms of anxiety and depression were primarily measured using the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983). The HADS scale has two subscales, one for anxiety (HADS-A), and one for depression (HADS-D). Both subscales consist of seven items (e.g. “I still enjoy the things I used to enjoy” and “Worrying thoughts go through my mind”) that are rated on a 4-point Likert scale. In this study, HADS was used as a dependent variable when comparing the parity groups, and also included in the cluster variate. As an alternative measure of anxiety and depression, the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) was used in the validation of the final cluster solution. The EPDS is a 10-item 4-point Likert scale that was designed to screen for postpartum depression but has been found reliable in detecting depressive symptoms also during pregnancy (Green & Murray, 1994; Rubertsson et al., 2014). Although primarily aimed at screening for depressive symptoms, an anxiety subscale (EPDS-A) consisting of three of the items has been suggested (Matthey, 2008).

Data analysis

Primiparous and multiparous women were compared using the Mann-Whitney U test and Pearson’s Chi-Square test with additional calculations of the Odds Ratio. Potential clusters were investigated using a series of hierarchical (Ward’s method, squared Euclidean distance) and non-hierarchical (K-means) cluster analyses (Hair, Black, Babin, & Anderson, 2014). The final cluster solution was profiled and compared on the clustering variables using the Kruskal-Wallis H test. The stability of the cluster solution was investigated by rerunning the K-means analyses with random seed points, and cross tabulating the assignment of cases to clusters. In a final step of validation, the clusters were compared for external correlates.

Study 4
Design and setting

Study 4 was part of the project Childbirth-Related Fear and Worry During Pregnancy. This was a cross-sectional questionnaire study, with a general sample of pregnant women recruited at antenatal health care units in two Swedish regions; Jämtland/Härjedalen and Örebro County.

Participants and procedures

In this study, the recruitment took place in antenatal health care, at the first visit following the ultrasound screening examination. The inclusion criteria
were no adverse findings at the ultrasound screening examination and mastery of the Swedish language. Of 829 women assessed for eligibility, 764 fulfilled the inclusion criteria and were invited to participate in the questionnaire study. Of these, 701 gave their written consent and 499 returned the questionnaire. Due to the discrepancy between the annual birth rate in one of the regions and the number of exclusions and non-consents reported by the antenatal midwives in this region, we have reason to believe that all eligible women might not have been approached, or that exclusions and non-consents were not reported as intended.

**Measurements**

The questionnaire included pregnancy details (pregnancy week, currently experienced pregnancy complications), sociodemographic details (age, civil status, country of birth, education, and occupational status), self-reports relating to obstetric history (e.g. if they had given birth before, including mode of birth and year) and an open-ended question regarding previous negative experiences in health care.

*Fear of birth*, was measured using FOBS (Haines et al., 2011; Hildingsson et al., 2017). It was used both continuously and as a dichotomous outcome with a FOBS score of 60 or above indicating high levels of fear of birth. In the present study, Cronbach’s alpha was .93.

*Pain catastrophizing* was measured using the Pain Catastrophizing Scale (PCS; Sullivan et al., 1995). In this 13 item scale, the participants are asked to rate the extent to which they experience various thoughts and feelings in relation to actual and anticipated pain (e.g. “When I’m in pain I wonder whether something serious may happen”) on a 5-point Likert scale. In this study, PCS was used as one of the predictors of fear of birth.

*Intolerance of Uncertainty*, or to be more specific, cognitive and behavioral manifestations or consequences of intolerance of uncertainty, was assessed using the Intolerance of Uncertainty Inventory part B (IUI-B; Gosselin et al., 2008). The 30 items of the scale (e.g. “In an uncertain situation, I tend to exaggerate the odds that things will go badly.”) were translated into Swedish from the English version of the scale, and back-translated again. Items were rated on a 5-point Likert scale. IUI-B was used as one of the predictors of fear of birth in this study.

*Positive beliefs about worry* were measured using Why Worry II (WW-II; Freeston et al., 1994; Hebert, Dugas, Tulloch, & Holowka, 2014). The 25 items (e.g. “If I worry, I will be less unhappy when a negative event occurs.”) were rated by the participants on a 5-point Likert scale. Translation was made from
English to Swedish, using back-translation for confirmation. WW-II was used as one of the predictors of fear of birth in this study.

*Cognitive avoidance,* or the tendency to deal with intrusive threatening thoughts by employing cognitive avoidance strategies, was measured using the Cognitive Avoidance Questionnaire (CAQ; Gosselin et al., 2002; Sexton & Dugas, 2008). In this questionnaire, 25 items such as, “I distract myself to avoid thinking about certain disturbing things.” are rated on a 5-point Likert scale. This questionnaire was also translated from English to Swedish, with additional back-translation. CAQ was used as one of the predictors of fear or birth in this study.

**Data analysis**

Between group comparisons were calculated using the Mann-Whitney *U* test, and correlations using Spearman’s rho. Hierarchical linear and logistic regression analyses were used to predict fear of birth both as a continuous and a categorical measure. Both regression models were built in two steps, including primiparity as the only predictor in the first step (using the enter method), and the psychological predictor variables: pain catastrophizing, intolerance of uncertainty, positive worry beliefs and cognitive avoidance in the second step (using a stepwise method). In the logistic regression model, fear of birth was dichotomized using the cut-off point of FOBS ≥ 60 (Hildingsson et al., 2017; Ternström et al., 2015). The psychological predictor variables were also dichotomized, using the 4th quartile of each instrument as the cut-off point.
4 Ethical considerations

All studies were conducted in accordance with the ethical principles for medical research involving human subjects, as stated in the Declaration of Helsinki (World Medical Association, 2013). Both the U-CARE Pregnancy trial (Studies 1 and 3) and the observational Childbirth Related Fear and Worry During Pregnancy (Study 4) were registered at ClinicalTrials.gov (NCT02306434 and NCT03353168) and approved by the Regional Ethical Review Boards in Uppsala (No. 2013/209) and Umeå (No. 2014-372-31Ö).

In both of these projects, participants were given both oral and written information about the study at hand, and had the opportunity to ask questions. They were informed that participation is voluntary, and that they may withdraw their consent to participate at any time without giving a reason, along with information about how to make any such request. They were informed about their right to confidentiality, and about how data would be stored and used within the projects. Finally, all participants in these projects gave their written informed consent to participate.

The U-CARE Pregnancy Trial (Studies 1 and 3) was conducted using a secure website for both data collection and implementation of the guided ICBT. The website used double authentication for login (user name, personal password and unique five digit code sent to the mobile phone at each login), and role-based privileges to access information (Sjöström et al., 2014). In the project Childbirth Related Fear and Worry During Pregnancy (Study 4), questionnaires were coded and separated from the written consent form.

For ethical reasons, women who had received a negative result on the ultrasound screening examination were not approached in either study. All participants in both projects had full access to standard antenatal and maternal health care. Women taking part in other medical or psychological treatments, were not asked to terminate those, and neither study restricted the opportunities to seek additional care.

In the U-CARE Pregnancy trial (Studies 1 and 3) there was no assessment of comorbid disorders and therefore no exclusion of participants based on an established need of specialized psychiatric care. If any participating women were thought to benefit from such care, they were asked to contact ordinary health care services and received guidance as to where to turn.
5 Summary of findings

Study 1

A total of 258 pregnant women were included in the study. Of the women that scored positively for fear of birth at screening, women included in the trial did not differ from the ones not included with regard to their age, pregnancy week, or level of fear of birth. However, nulliparous women were more likely to accept participation than were parous women; 38% of the nulliparous women and 22% of the parous women were included in the final sample, $\chi^2(1) = 25.70, p < .001$.

The participants had a mean age of 29.6 years ($SD$ 4.88). Sixty percent of the participants were primiparous and 40% multiparous, 94% were living with a partner and 87% were born in Sweden. Almost 50% reported a previous or current psychiatric condition. The two intervention groups did not differ in their levels of fear of birth or with regard to any other background characteristic at screening or pre-intervention. Primiparous and multiparous women did not differ with regard to their level of fear of birth at screening or pre-intervention. Although all participants scored positively for fear of birth ($FOBS \geq 60$) at screening, 52 of the participants (20%) scored below this cut-off point at pre-intervention.

Of 127 participants randomized to guided ICBT, 103 (81%) commenced treatment, and 60 (47%) started working with the second treatment module. Only ten percent of the women opened five or more of the treatment modules, and one single woman (less than 1%) finished all treatment modules. Treatment adherence did not differ depending on the parity of women.

With regard to participant non-response, 24 women (18.9%) randomized to guided ICBT and seven women (5.3%) randomized to standard care were lost to follow-up (not responding either to post-intervention or follow-up), $\chi^2(1) = 11.21, p < .001$. Being lost to follow-up was not associated with any pre-intervention characteristic (including parity) or level of fear of birth at screening or pre-intervention.

Observed and estimated means of the primary outcome measure (fear of birth) are plotted in Figure 3. Levels of fear of birth did not differ between the intervention groups at post-intervention. At follow-up one year after birth, participants in the guided ICBT-group showed lower levels of fear of birth, both in observed and estimated data (Cohen’s $d = 0.28$ and $d = 0.29$ respectively). Within-group effect sizes of the decrease in fear of birth ranged between Cohen’s $d = 0.58$ and $d = 1.86$. 
At post-intervention, 29 women (22.1%) allocated to standard care and 11 women (8.7%) in the guided ICBT-group had responded to treatment. This difference was significant, $\chi^2(1) = 8.94$, $p = .003$. The corresponding figures at follow-up were 37 (28.2%) and 44 (34.6%) women, a difference that was not significant.

The Linear Mixed Model analysis showed an overall decrease in fear of birth over time, $F(1,905) = 220.08$, $p < .001$. A significant interaction between treatment allocation and time was found, indicating that the reduction in fear, from screening until one year after birth, was larger in the guided ICBT group, $F(1,192.538) = 4.96$, $p = .027$. No significant interaction was found between parity and time, or between treatment, parity and time. This indicates that there was no difference in the reduction in fear between primiparous and multiparous women, and no difference in the effect of treatment over time with regard to parity.

In conclusion, fear of birth decreased over time in both intervention groups, with similar levels of fear in both groups at post-intervention. Despite very
low adherence to guided ICBT, the reduction in fear of birth was larger in this group when taking the whole study period into consideration. Primiparous and multiparous women did not differ with regard to treatment adherence, levels of fear of birth, reduction in fear over time, or the effect of treatment.

Study 2

Results relating to the specificity of fear of birth were found in 27 studies, in general pointing to positive associations between fear of birth and psychiatric diagnoses, care and medication, as well as between fear of birth and symptoms of both anxiety and depression.

In terms of fear acquisition, both indications of fear conditioning and transmission via information were commonly reported (in 25 and 10 studies respectively), while the role of vicarious experiences was less studied. Possible fear conditioning among primiparas was only found in studies investigating the impact of experiences of abuse or violence. No study of multiparous women was found to investigate fear of birth prior to, or during, previous pregnancies. In line with the suggested distinction between primary and secondary fear of birth, several studies indicating higher mean levels of fear for primiparous women were found. However, results showing positive correlations of fear over time or over pregnancies were also found, introducing the possibility of a vicious cycle of fear as an alternative to a simple dichotomization based on parity. Acknowledging a possible vicious circle of fear, negative consequences of fear of birth were summarized, showing somewhat equivocal results regarding different modes of birth, experience of pain, duration of birth, birth complications and postpartum maternal health.

Physiological manifestations of fear (e.g. sleep disturbance and nightmares, tachycardia, tenseness, restlessness and stomach pains) were briefly mentioned in six studies, while their role in the development and maintenance of fear of birth was not elaborated upon.

Cognitive aspects of fear of birth, were addressed in 15 studies. Fears were commonly found to relate to the process of giving birth, the life and wellbeing of the mother and child, own capabilities and reactions during childbirth, the uncertainty and unpredictability of childbirth, the competence and behavior of health care personnel, and the future role and life after giving birth. Eleven quantitative studies investigated the association between fear of birth and childbirth specific self-efficacy or self-rated coping ability, generally pointing to significant associations. Self-efficacy or perceived stress coping ability were
also addressed in four qualitative studies. The concept of pain catastrophizing was found in one study.

Behavioral aspects of fear of birth were found in four studies investigating avoidance or postponing of pregnancy. Seventeen studies addressed cesarean section as preferred method of birth, and seven studies the relation between fear of birth during pregnancy and subsequent actual mode of birth (e.g. rates of planned cesarean sections). Usage of, or preference for, epidural analgesia was investigated in six studies and cognitive or experiential avoidance (e.g. avoidance of thoughts and memories, not talking about one’s fear, avoidance of situations that might trigger fear or anxiety, or avoidance of information) in three. More subtle strategies to avoid, alleviate or cope with fear (e.g. information seeking, checking of fetal movements, and reassurance seeking) were anecdotally described.

Overall, few studies were found to adopt a clear-cut psychological perspective, so ideas about the psychology of fear of birth often had to be derived from studies with other objectives. Although methodological limitations made conclusions difficult, the results pointed to various pathways of fear acquisition and the possibility of a vicious circle in fear of birth. With regard to the cognitive aspects of fear of birth, a range of fear themes relating to possible threats in the future were identified, along with results pointing to self-efficacy, coping ability, pain catastrophizing, and intolerance of uncertainty as concepts potentially important for the understanding of fear of birth. Both physiological and behavioral factors were found to have been overlooked in the literature. Still, several examples of possible behavioral avoidance were identified. Studies exploring the possibility of heterogeneity among women fearing birth were found to be lacking, and conclusions regarding both the specificity and the cohesiveness of the concept were to be found premature. Three prioritized areas of research were identified: (1) systematic investigations of psychological mechanisms, such as avoidance, reassurance and cognitive biases in fear of childbirth, (2) longitudinal studies exploring possible vicious circles over more than one pregnancy, and (3) within group comparisons of psychological characteristics among women fearing childbirth.

**Study 3**

Of the 206 women in this selected sample, 58% were primiparas and 42% were multiparas. They had a mean age of 29.37 years ($SD$ 4.78), were most often born in Sweden (87%) and lived with a partner (95%). Fifty percent of the women reported current or previous mental disorders, and reports of both
previous negative experiences in health care, and traumatic experiences in
general were common, 51% and 62% respectively. Based on their self-reports,
66% of the women were identified as potential cases of anxiety, and 16% as
potential cases of blood and injection phobia.

No differences in the levels of fear of birth, performance-based self-esteem,
pain catastrophizing, blood and injection phobic anxiety, or symptoms of
anxiety, depression or posttraumatic stress could be found between
primiparous and multiparous women. The only difference found was that
primiparous women reported higher levels of blood and injection phobic
avoidance (\(Mdn\ 2.00\ vs.\ 1.00,\ U=4303.00, \ z=-2.08,\ p=.038,\ r=.14\)).
Primiparous women were also more likely to report clinically relevant levels
of blood and injection phobic anxiety, \(OR = 2.57, 95\%\ CI [1.09, 6.01]\), while
multiparous women more often reported previous experiences of trauma, \(OR = 2.90, 95\%\ CI [1.58, 5.32]\), and negative experiences in health care, \(OR = 1.93, 95\%\ CI [1.09, 3.39]\).

The cluster analyses suggested a five-cluster solution (see Figure 4). Both
primiparous and multiparous women were represented in all five clusters.
The clusters differed significantly on all cluster variables (Kruskal-Wallis \(H(4) = 58.31-108.39,\ p<.001\)).

Cluster 1 identified a group of women (27.7% of the sample) with relatively
high scores on pain catastrophizing and symptoms of anxiety, depression,
and posttraumatic stress, as well as the highest scores of all on performance-
based self-esteem. The women in Cluster 2 (18.8% of the sample) showed
generally low levels of pain catastrophizing, performance-based self-esteem,
posttraumatic stress symptoms, and blood and injection phobic anxiety, while
still relatively high levels of anxiety symptoms. Cluster 3 (30.7% of the sample)
identified a group of women with overall low scores on all cluster variates
and all validation variables, including the lowest mean level of fear of birth,
while the women in Cluster 4 (12.9% of the sample) were identified with
salient symptoms of blood and injection phobia. Cluster 5 (9.9% of the sample)
seemed to identify a group of women with overall high symptom load,
peaking at posttraumatic stress symptoms and pain catastrophizing. Ninety-
five percent of these women reported clinical levels of posttraumatic stress
symptoms, and the occurrence of potential cases of anxiety was just as high.

In conclusion, the results indicate that women reporting fear of birth can
be viewed as a heterogeneous group. While only minor differences were
found between primiparous and multiparous women, heterogeneity with
regard to psychological characteristics could be shown, and possible
subgroups could be identified.
Study 4

In this sample of 499 pregnant women, 19-45 years of age ($M = 30.14; SD = 5.03$), 46% were primiparas and 54% multiparas. Almost all women (99%) lived with a partner and were born in Sweden (95%). One hundred and twenty-two women (24.6%) reported high levels of fear of birth (FOBS ≥ 60). Women with high levels of fear of birth also had higher levels of pain catastrophizing, intolerance of uncertainty, positive worry beliefs, and cognitive avoidance ($p < .001$, $r$ ranging between -.23 and -.39). All of these variables were also positively correlated with fear of birth (Spearman’s rho ranging between .36 and .47).

In the linear regression analysis, the final model explained 28 % of the variance in fear of birth. In this model, fear of birth was predicted by pain...
catastrophizing ($\beta = .35$, $p < .001$), intolerance of uncertainty ($\beta = .16$, $p = .003$), and positive worry beliefs ($\beta = .10$, $p = .023$).

In the logistic regression analysis, pain catastrophizing and intolerance of uncertainty above the 4th quartile of each scale significantly predicted fear of birth above the cut-off point of FOBS $\geq 60$. The odds ratios for fear of birth were $OR = 3.49$, 95% CI [2.17, 5.61] for women with high levels of pain catastrophizing and $OR = 3.25$, 95% CI [2.00, 5.27] for women with high levels of intolerance of uncertainty.

Although nulliparas reported slightly higher levels of fear of birth than multiparas ($Mdn$ 36.50 vs. 28.00, $U = 26824.00$, $z = 2.18$, $p = .029$, $r = -.10$), primiparity was not identified as a significant predictor, either in the linear or in the logistic regression analysis.

Taken together, pain catastrophizing and intolerance of uncertainty were the most evident predictors of fear of birth, although positive worry beliefs and cognitive avoidance were also correlated with fear ratings. Parity did not significantly predict fear of birth in the multivariate logistic analyses.
6 Discussion

Fear of birth or birth-related anxiety?

As summarized in the Introduction, fear is typically described as an intense alarm response to an acute threat. The eliciting stimulus is explicit and present in the moment, the physiological response is intensive but subsides rather quickly on termination of the threat, and the behavioral component is oriented towards fight or flight in order to survive. Anxiety is instead characterized by a long-lasting general state of unease or distress, oriented towards a potential future threat. The stimuli that elicit anxiety in a particular moment, are not always as evident as fear eliciting stimuli, and the behavioral component orients toward avoidance of future threat. Can these descriptions help us in understanding the concept of fear of birth?

The objects of fear found in Study 2 were all future-oriented, rather than associated with an immediate threat in the here-and-now. They related to something that the women feared might happen while giving birth - an anticipation of a potential future threat. Although not published, women participating in the U-CARE Pregnancy trial, gave similar descriptions of their fears relating to childbirth. It thus seems that, more often than not, the threat is perceived to be in the future. As will be discussed in more detail later, not knowing what to expect and the unpredictability of giving birth have been found central themes relating to the experience of fear of birth (Sheen & Slade, 2018), indicating the experience of a potential rather than an absolute threat. From this perspective, much of what we describe as fear of birth, could be conceptualized as an anxious apprehension.

In line with this, many of the behavioral components of fear of birth found in Study 2, seem to orient towards the avoidance of future threat. Postponing of pregnancy, wishing for a cesarean section, giving birth by a planned cesarean section, and wishing to avoid pain all seem to match that description. Another cluster of behaviors described, e.g. avoidance of thoughts and memories, not talking about one’s fear, avoidance of situations that might trigger fear or anxiety, avoidance of information, and reassurance-seeking, seem more focused on the avoidance of aversive emotional experiences or experiential avoidance.

As indicated by the few descriptions of physiological manifestations found in Study 2, strong physiological responses do not seem to be typical for fear of birth. Physiological dimensions such as tenseness, restlessness,
nervousness, and stomach pains seem to be more in line with the general state of distress described to be a part of the anxious response (Lang et al., 2000).

So, fear of birth or birth-related anxiety? The findings in Study 2 imply that in many cases (and from the perspective of emotional theory) it may often be more reasonable to talk about anxiety relating to, rather than fear of, giving birth. Given the overlapping nature of fear and anxiety, and the differences in how these concepts are defined and understood, others may come to another conclusion. It is also important to remember that both fear and anxiety are natural emotional processes, functioning to avoid adverse outcomes and enhance the chances of survival. The usefulness of these responses is completely dependent on its context. Only when the response is unreasonably intensive in relation to the objective danger of the situation, and leads to long-lasting significant distress or functional impairment, is the presentation of fear or anxiety said to be clinical. Hence, reporting fear of birth is not a sign of pathology – some level of fear or anxiety relating to giving birth might well be functional, especially when the context includes possible threats. However, clinical assessment might be appropriate in cases of high levels of long-lasting fear or anxiety, especially when leading to avoidance and significant emotional distress or impairments in important areas of functioning.

Regardless of how we define fear of birth psychologically, this does not necessarily have to correspond perfectly with what we call the phenomenon in everyday communication. In both Swedish and English, the word “fear” is more frequently used and easy to understand than the word “anxiety”. At least in Swedish, the word anxiety gives a hint of pathology, and is thus more likely to be stigmatizing than the word fear. It is also a word that easily can be misinterpreted, and that is often used in a way that does not correspond with the meaning it has been given in psychological theories (i.e. with connotations of shame, guilt, and regret). Hence, although it seems reasonable to conceptualize fear of birth as a form of anxiety, it may still be relevant to label the concept using the word “fear” together with a word pointing to the experience of reference. In my opinion, the terms fear of birth, fear of childbirth, childbirth-related fear, fear of giving birth etc., can be used interchangeably.

Is fear of birth a specific and coherent concept?

During the past 15-20 years, the limitations of a disorder-focused perspective on mental disorders have been increasingly emphasized. Two major lines of critique are the lack of diagnosis specificity, implied by the high correlation between disorders and the considerable amount of overlap with
regard to etiological and biological factors, and the great heterogeneity within different diagnostic categories (Barlow, 2011; Harvey et al., 2011; Meidlinger & Hope, 2017; Watkins, 2015). This critique has been important for the development of new approaches to emotional disorders, e.g. the description of general biological and psychological vulnerability factors (Barlow, 2002), the investigation of transdiagnostic mechanisms (Harvey et al., 2004), and the formulation of the research framework RDoC (Morris & Cuthbert, 2012).

Although fear of birth is not a diagnostic category, the great overlap found across emotional disorders suggest that fear of birth is also likely to share features with other forms of emotional suffering. In Study 1, we found that almost half of our sample of women reporting fear of birth also reported previous or ongoing experiences of emotional disorders. In the even more selected sample in Study 3, the included women clearly showed more signs of emotional strain than generally expected during pregnancy, with considerably higher prevalence of potential cases of blood and injection phobia and anxiety in general. In the literature review presented in Study 2, the majority of articles identified to explore associations between fear of birth and different measures of anxiety and depression, as well as psychiatric diagnoses, care and medication, supported a positive association. Building on such correlational results, fear of birth has been declared an experience or a concept within the domain of anxiety (Johnson & Slade, 2002; Wijma et al., 1998). Hence, in order to be valid, any measure of childbirth-related fear or anxiety should be positively correlated with measures of anxiety symptoms. This does not mean that anxiety symptoms necessarily have a causal role in fear of birth. The causality may just as well be reversed, or correlation accounted for by other variables. For these reasons, we decided not to include symptoms of anxiety and depression among the predictors of fear of birth in Study 4.

While assuming fear of birth to be a concept within the domain of anxiety, correlations with other measures of anxiety have been low enough to distinguish it from general anxiety. Thus, fear of birth has been suggested to be a relatively distinct syndrome (Johnson & Slade, 2002; Wijma et al., 1998). Similar conclusions have been drawn with regard to the related concept of pregnancy anxiety (Huizink et al., 2004). Even if we embrace such a categorical approach to mental disorders, the evidence supporting the specificity of fear of childbirth is somewhat limited. As far as we know, fear of childbirth might not be the same thing as experiencing anxiety symptoms in general, but might be a manifestation of a wide range of mental disorders, their subclinical counterparts, or a range of transdiagnostic mechanisms.
It is also possible that fear of birth is not a cohesive concept. In fact, neither fear of birth (as measured with W-DEQ A) nor pregnancy anxiety (as measured with PRAQ-R) seem to capture coherent constructs (Fenwick et al., 2009; Garthus-Niegel et al., 2011; Huizink et al., 2004; Johnson & Slade, 2002; Lukasse et al., 2014; Pallant et al., 2016). The multidimensionality of W-DEQ A has been taken to indicate deficiencies in the tool of measurement, but also the possibility of subscales capturing different aspects of fear of birth (Pallant et al., 2016).

Even if we could use a tool of measurement that has a unidimensional structure, this does not necessarily mean that fear of birth is a unidimensional construct. There could still be room for heterogeneity among women identified with fear of birth. In Study 2, therefore, we found it too early to state that fear of birth is a distinctive and cohesive phenomenon and decided to investigate this further in Study 3.

Is fear of birth a specific and coherent concept? It is possible that future research might bring us to that conclusion or to a more distinct specification of this form of fear or anxiety. However, to date, I do not believe we have grounds for concluding either the specificity or cohesiveness of fear of birth.

What about primary and secondary fear of birth?

In research relating to pregnancy and childbirth, the parity of women is always an important factor to consider. With regard to fear of birth, many researchers and clinicians distinguish between primary and secondary fear of birth, based on the parity of the woman reporting fear.

In our studies, some differences were found between primiparous and multiparous women. As in previous research, primiparous women in the general pregnant sample in Study 4 reported slightly higher levels of fear of birth than did parous women. This difference was also evident in the screening for Study 1 (results not published), while not in the selected samples included in Studies 1 and 3. In the regression analyses in Study 4, nulliparity was not a significant predictor of fear of birth, either as a continuous or a dichotomous construct. Hence, although the mean levels of fear for the most part are found to be higher among primiparas in general pregnant samples, other variables than parity seem to be more important in predicting fear of birth.

In Study 1, there was no difference between primiparas and multiparas in the effect of the two interventions, or with regard to treatment adherence or participant non-response. It thus seems that none of the treatment alternatives suited either parity group better.
When comparing primiparas and multiparas in Study 3, there was no significant difference with regard to symptoms of anxiety, depression or posttraumatic stress. Levels of pain catastrophizing and performance-based self-esteem did not differ either. The only differences found were that primiparas more often showed signs of blood and injection phobic anxiety, and that parous women more often reported previous traumas or negative experiences in health care. Both primiparous and multiparous women were represented in all five clusters identified in the same study. Hence, multiparous women could be found in the cluster of women presenting with high levels of blood and injection phobic anxiety, and primiparous women could be found in the cluster of women with salient reports of posttraumatic stress symptoms. Although parity may play a role in the likelihood of belonging to a certain subgroup, it does not seem to be the only, or even most central, factor to consider.

In the distinction between primary and secondary fear lays an assumption of differences in fear learning. While the pathways of fear acquisition for primiparous women are typically assumed to be indirect, the fears of multiparas are almost exclusively understood to be acquired through classical conditioning during childbirth. Although these learning pathways may often be at play, we cannot conclude with any certainty that this is always the case. For this reason, one of the aims of Study 2 was to look for descriptions of possible pathways of fear acquisition. With the exception of studies investigating associations between fear of birth and previous experiences of violence and abuse, we could not find any studies that were designed to explore fear of birth as a conditioned (and possibly generalized) response in primiparous women. Regarding fear acquisition in multiparous women, we could not find any studies that investigated the possibility of these women experiencing fear of birth prior to, or during, previous pregnancies. Before assuming that these patterns of fear development do not exist, they need to be investigated. In the light of diathesis-stress models of anxiety (Barlow, 2002; Williams et al., 2005), accepting the current distinction between primary and secondary fear of birth would be to argue for the relative importance of vulnerability factors accounting for fear of birth in primiparous women, and the relative importance of stressors accounting for fear of birth in multiparous women. Do we really have reason to think that primiparous and multiparous are that different, and that the full diathesis-stress model does not apply to fear of birth?

In Study 2 we found several studies showing that levels of fear of birth correlated over time. Based on the hypothesis of a vicious cycle of fear (Wijma
et al., 2002; Zar et al., 2001) we also looked for studies investigating negative consequences during birth and in the postpartum period. The findings were not conclusive, but still suggested that fear of birth during pregnancy might have an impact on birth parameters such as the mode and duration of birth. We also found studies indicating that women expressing fear of birth during pregnancy were more likely to report negative birth experiences and higher levels of labour pain. Taken together these findings give some support to the possibility of a vicious circle, in which fear of birth during pregnancy might influence the experience of future stimuli and the chain of events during birth. Combined with the previously shown association between fear of birth in multiparous women and the self-report of past negative birth experiences (Lukasse et al., 2010, 2011; Nilsson et al., 2012; Størksen et al., 2013), it seems possible that the vicious circle could also extend across pregnancies. This would imply that fear of birth among multiparous women does relate to negative birth experiences, but also may have a more complex etiology. This possibility is well in line with the results found by Størksen et al. (2013). In their study of 1 357 multiparous women, they found that about 60% of the women reporting fear of birth had previously experienced an obstetric complication. Still, only 10% of the women that had experienced an obstetric complication developed fear of birth, and only one fourth of the women that experienced their previous birth as negative, developed fear of birth. Apparently, neither complicated births nor negative birth experiences can explain the development of fear of birth in multiparous women.

So, what about primary and secondary fear of birth? No-one would argue that previous experiences of giving birth (or the lack thereof) are not of importance. However, we might need to acknowledge that if one has given birth before or not is not the only factor of importance. It may be so that parity is not even the most central factor for distinguishing between different types of fear of birth, or for understanding the needs of a woman reporting such fear.

Are women fearing birth a heterogeneous group?

Since the distinction between primary and secondary fear of birth is commonly emphasized, it is surprising to see the total lack of studies investigating other forms of heterogeneity among women fearing birth. Of course, subgroups based purely on the level of fear are compared at times, but not in a way that helps us understand why levels of fear differ. The aim of Study 3 was to address this gap in the literature; not necessarily to conclude what specific subgroups there might be, but rather to explore if this could be an interesting approach to learn more about women reporting fear of birth.
The findings suggest that five seemingly relevant clusters could be found in the sample. Since cluster analysis is a descriptive and non-inferential method, we cannot claim these clusters to be generalizable to other samples, or “true” subgroups in fear of birth. They may, however, give us some ideas about interesting groups to consider in future research. From my point of view, three of the subgroups are especially interesting.

The largest of the groups identified in Study 3, was a cluster of women with relatively low scores on all parameters included. The self-reports of these women were comparable to the self-reports of women in general pregnant samples. As discussed in the paper, the presence of this cluster among women with fear of birth, suggests that these women cannot always be viewed as belonging to a highly distinct and clinical population. Almost 30% of the women in Study 3 belonged to this subgroup. Since almost 20% of the total sample in the U-CARE Pregnancy trial were excluded from this sample due to scoring below the cut-off point for fear of birth at this time of measurement, this low-symptomatic group is likely to be even larger if looking at women reporting high levels of fear on one single occasion.

At the other end of the continuum, we found a group of women presenting with a generally high symptom load, salient symptoms of posttraumatic stress, and frequent self-reports of psychiatric disorders. A third group, with a very distinctive profile, was the group of women with low self-reports on most variables and an evident peak on blood and injection phobic anxiety. The profiles of these three groups of women fearing birth are very different, and they are likely to be in need of completely different interventions. Hence, my answer to the question, *Are women fearing birth a heterogeneous group?* would be yes.

**A transdiagnostic perspective on fear of birth?**

To the best of my knowledge, fear of birth has not been explored from a transdiagnostic perspective before. But since fear of birth repeatedly has been associated with different indicators of anxiety and depression, the possibility of shared processes seems reasonable. With the heterogeneity shown among women fearing birth in Study 3, it also seems possible that different mechanisms might be at play for different women or subgroups. Although the works of this thesis are far from bringing us to a firm conclusion, they may give a hint of possible transdiagnostic perspectives to investigate in the future.

Intolerance of uncertainty has been proposed as a transdiagnostic mechanism across anxiety disorders and depression (Carleton et al., 2012; Gentes & Ruscio, 2011; McEvoy & Mahoney, 2012). In the present work,
intolerance of uncertainty was predictive of fear of birth in Study 4, and fears relating to uncertainty were described in several studies included in Study 2. The importance of uncertainty has been further supported in a recently published meta-synthesis of reported contents of fear, where unpredictability of childbirth was found to be the overarching theme linking all the specific fear elements (Sheen & Slade, 2018). Uncertainty relating to the unpredictability of childbirth was also described as a natural part of the experience of worry during pregnancy, by both primiparous and multiparous women (Ternström, Hildingsson, Haines, & Rubertsson, 2016). Taken together, the unpredictability and uncertainty of childbirth seem to be a key factor to investigate further, preferably in relation to individual tendencies to fear the unknown (Carleton, 2016) or find uncertainty intolerable.

Pain catastrophizing was the strongest predictor of fear of birth in Study 4, and one of the variables differentiating the clusters in Study 3. Although pain catastrophizing has not been described as a transdiagnostic variable, catastrophizing in general has been suggested as one (Gellatly & Beck, 2016). It is possible that the associations between fear of birth and pain catastrophizing could be accounted for partly by a general tendency to engage in catastrophizing cognitions.

Another suggested transdiagnostic feature is positive and negative metacognitive beliefs (Harvey et al., 2004). In Study 4, positive beliefs about worry were associated with fear of birth but could not significantly predict fear of birth in multiple regression. It might be that this process is not central to fear of birth, or that it is so only for a rather small subgroup of women.

Avoidance and safety behaviors are also understood to be of transdiagnostic nature (Harvey et al., 2004; Watkins, 2015). The results of Study 2 suggest that overt avoidance of pregnancy, vaginal birth, pain, and information as well as safety behaviors, such as seeking reassurance and counting fetal movements may be behavioral manifestations of fear of birth. Different subgroups of women experiencing fear of birth might also share more specific patterns of behavioral avoidance. Fear and avoidance of blood and injection phobic stimuli was, for example, evident in one of the subgroups in Study 3.

In addition to the possible mechanisms explored in these works, many other transdiagnostic processes could be of interest in future research. Selective attention or vigilance to external and internal stimuli (Mansell et al., 2008; Watkins, 2015) might be relevant for the understanding of triggers of anxiety during pregnancy, and for bursts of fear during birth. Selective memory processes (Watkins, 2015) might be highly relevant for fear of birth
relating to negative birth experiences, or for responses that could be
generalized from other traumatic experiences. Another transdiagnostic
process likely to be of interest is repetitive (or recurring) negative thinking
(Harvey, 2004), which has been defined as “repetitive thinking about one or
more negative topics that is experienced as difficult to control” (Ehring &
Watkins, 2008, p. 193). Worry is one form of repetitive negative thinking, that
is commonly described with regard to fear of birth. In fact, the words fear,
anxiety and worry are often used interchangeably within this field. In the
psychological literature, worry is described as a chain of relatively
uncontrollable verbal thoughts, often with a negative affect weighting, that
function as an attempt to avoid or cope with potentially aversive events in the
future (Barlow, 2002; Borkovec, 1994; Borkovec et al., 1983). In my view, worry,
per this definition, well matches the cognitive activities in women reporting
high levels of fear of birth.

So, could we apply a transdiagnostic perspective on fear of birth? My current
answer to this question would be that it is likely. By investigating the role of
transdiagnostic mechanisms in fear of birth, we could make use of what has
already been found to be important for other forms of fear and anxiety.

Is (Internet-delivered) CBT effective in treating fear of birth?

Initially, this was the main research question of this thesis, and the
expected answer was “yes”. Now, a few years later, I still hope to say “yes”
one day, and to accompany that “yes” with a description of “how” and “for
whom”.

The findings in Study 1, indicate that treating fear of birth using guided
ICBT is not an easy task. The overall treatment adherence was low, and the
decrease in fear during pregnancy was modest. Even if guided ICBT could be
efficacious for some, it definitively did not suit all participants. We did not
find any difference in effect or treatment adherence between primiparas and
multiparas. Hence, parity does not seem to be the answer to the “for whom”
question. Perhaps we will be able to find some clues to this question when
investigating predictors of change in the guided ICBT group. With regard to
the “how”, we still have a lot of work to do. The overall setting in which CBT
is offered, the treatment format, and every detail in the content and tone of
the material need to be considered.

In Study 1, we saw that fear of birth decreased over time in both groups. At
this point, it is difficult to say if this decrease should be attributed to the
passage of time, comparable effects of two different treatment alternatives, or
the combination of both. The low adherence in guided CBT indicates that time
might indeed be an important factor to consider. Another possibility is that the mean decrease in fear in the guided ICBT-group, covers variability in treatment effect depending on other variables, for example the level of engagement in treatment.

The most surprising result in Study 1 was to find lower levels of fear of birth in the guided ICBT group at follow-up. This finding is difficult to interpret, given the possible impact of factors relating to childbirth and postpartum life (e.g. spontaneous or induced start of labor, use of analgesia, birth modes, complications relating to pregnancy and birth, postpartum emotional reactions etc). Although the modes of birth did not differ between the groups (Larsson et al., 2017), the complex interaction of factors like these is not fully understood, and they may all play a part in our findings, either as mediators, moderators, or confounding variables. It is also possible that this finding is not related to what was going on in the guided ICBT, but what happened in standard care. Might the interventions aiming at reducing fear in an ongoing pregnancy have negative consequences during childbirth (e.g. promises not held, higher rates of induction of labor and conversion to a cesarean section), that affect the women’s level of fear with regard to future births?

Cognitive behavior therapy offers a wide range of therapeutic techniques, and has been successfully used in the treatment of many emotional disorders. In Study 4, we found that pain catastrophizing (or perhaps catastrophizing in general), as well as intolerance of uncertainty and positive beliefs about worry were more or less predictive of fear of birth. All of these concepts are commonly addressed in CBT (e.g. by means of psychoeducation, self-monitoring, cognitive restructuring, behavioral experiments, exposure with or without response prevention, techniques aiming at cognitive defusion and acceptance, and pain management techniques). One could thus argue for the relevance of applying cognitive behavioral principles and techniques like these to target such things as catastrophic cognitions, intolerance of uncertainty or positive beliefs about worry when meeting women reporting high levels of fear of birth.

Considering the heterogeneity shown in Study 3, it is likely that women fearing birth might need different interventions. For many of the women in the large cluster with low overall symptom load, a brief intervention might be enough, while women in the cluster with a generally high symptom load, salient symptoms of posttraumatic stress, and frequent self-reports of psychiatric disorders might need more extensive interventions, at times in collaboration with their ordinary health care providers. While the few studies
evaluating the effects of CBT for antenatal depression show positive results (Nillni, Mehralizade, Mayer, & Milanovic, 2018), there are extremely few studies focusing on treatment of perinatal anxiety and trauma-related disorders, and an urgent need for such studies has been concluded independently in two recent systematic reviews (Loughnan et al., 2018; Nillni et al., 2018). Still, CBT is a recommended intervention for treating both depression and anxiety disorders in the perinatal period (National Institute for Health and Care Excellence, 2014b). One population, for which CBT interventions actually have been studied, are pregnant women diagnosed with blood and injection phobic anxiety. In an open trial, two exposure-focused group sessions showed very promising results in decreasing phobic anxiety and avoidance, as well as general symptoms of anxiety and depression (Lilliecreutz, Josefsson, & Sydsjö, 2010). Although the effect on fear or birth has not been investigated, the women in Study 3 that were identified with apparent symptoms of blood and injection phobic anxiety, could likely benefit from specific interventions like this.

Taken together, although we were not successful in engaging pregnant women reporting high levels of fear of birth in the guided ICBT evaluated in Study 1, this does not mean that all forms of cognitive behavior therapy should be avoided. It means that we need to learn from this experience, refine and improve our methods, and continue the search for possible psychological mechanisms and treatments for fear of birth. **So, is (Internet-delivered) CBT effective in treating fear of birth?** It might be, but not in the setting and format evaluated in Study 1. We are still far from concluding what intervention is effective, in what format, and for whom.
7 Methodological considerations

Measurement issues

In this work, fear of birth has been measured using the Fear of Birth Scale, i.e. FOBS (Haines et al., 2011; Hildingsson et al., 2017). This instrument has the advantage of being easily administered in clinical settings and easy for women to grasp (Ternström et al., 2016). The items are straightforward, asking for ratings of fear and worry relating to the approaching birth, and have shown good internal consistency in general pregnant samples (Haines et al., 2015; Haines et al., 2011). Although scales with few items have practical advantages, the brevity often comes at the price of reduced reliability (DeVellis, 2017; Eisinga, Grotenhuis, & Pelzer, 2013). Despite the fact that Cronbach’s alpha often is underestimated in analyses of two-items scales (Eisinga et al., 2013), the high internal consistency of FOBS was further confirmed in these studies by a Cronbach’s alpha of .93, both in the screening of the U-CARE Pregnancy trial (see the discussion in Paper 3) and in Study 4. Interestingly, Cronbach’s alpha in the selected population of Study 3 was only .70, indicating lower correlations in ratings of fear and worry at the higher end of the FOBS-continuum. Unfortunately, test-rest reliability of FOBS has not yet been investigated. Given that fear of birth seems to fluctuate over time, this form of reliability testing might be challenging. Another difficult issue to handle is how to gather reliable follow-up data on changes in fear of birth, since the implication of fearing birth is likely to change considerably following childbirth. In Study 1, the best solution we could find was to assess postpartum fear of birth by asking the participants to rate fear and worry when thinking about giving birth again.

Single-item scales have also been criticized for low content validity (McIver & Carmindes, 1981). So far, no results have challenged the validity of FOBS. Early validation using known groups showed promising results with more than 85% of women who had received counseling scoring over the original cut-off point of FOBS ≥ 50 (Haines et al., 2011). Qualitative analysis of women’s thoughts when assessing fear of birth using FOBS, has further shown that women have no difficulties in understanding the intention of the scale. They described their ratings easily, and gave examples of worry and fear relating to childbirth. This was taken as further support of the validity of FOBS (Ternström et al., 2016).

Reviewers have argued that the 19% prevalence of fear of birth in Study 1, indicates low specificity of FOBS or that the cut-off point used was too low. It
is true that the cut-off point of 60 or above might lead to a number of false positives, i.e. women scoring above the cut-off point without being particularly fearful. FOBS is primarily a screening instrument that is preferably used as a starting point to talk about fear of birth (Ternström, 2018). With that purpose, sensitivity (i.e. making sure of finding all true positives) would be of greater importance than specificity. As noticed by a reviewer, prevalence estimates of fear of birth are generally higher when using FOBS instead of W-DEQ. Still, FOBS has been validated against W-DEQ, showing good sensitivity (.89), as well as acceptable specificity (.79; Haines et al., 2015). We also need to bear in mind that there is no “true” prevalence of fear of birth to compare with, and that we cannot be conclusive in stating that one instrument gives better prevalence estimates that the other.

Psychometrically, FOBS also has the disadvantage of not being normally distributed, but often positively skewed or with tendencies of bimodality. This non-normality is a common problem using visual analogue scales, where response patterns often are bi- or tri-modal (McCormack, Horne, & Sheather, 1988). While this may be statistically challenging, fear of birth is not necessarily normally distributed in the population.

All variables in these papers rely on participant self-reporting. This may have some disadvantages, especially with regard to medical reports (e.g. modes of birth or comorbid disorders). In psychotherapy research, it is advisable to use diagnostic interviews to establish a reliable diagnosis (Öst, 2016) Since fear of birth is not a diagnosis, this was not an option. Another limitation is the use of questionnaires that have not previously been validated in Swedish. In Study 4, the three questionnaires that were translated into Swedish, were also back-translated into English in order to compare wordings. In the study, reliability testing was limited to calculations of Cronbach’s alpha, which in all cases revealed good internal consistency in the translated versions ($\alpha = .94-.97$).

**Representativeness of the samples**

Representativeness of the sample is of crucial importance for the generalization of findings. In these studies, all participants were recruited in standard antenatal care, i.e. they were typical pregnant women – experiencing more or less fear of birth. For ethical reasons, women who had just had a negative result on the ultrasound screening were not approached. Women who did not speak Swedish were also excluded. Hence, the findings in the current studies cannot be generalized to these groups. In both projects, we also have an unknown group of women who were not asked for participation.
by their antenatal midwife, or for whom the antenatal midwife did not report reasons for exclusion. We also have very limited information on women that declined participation. As a result, the generalizability of the results may be somewhat reduced.

Of the women that scored positively for fear of birth at screening in the U-CARE Pregnancy trial, there was no significant difference between women included in the trial or not, with regard to their age, pregnancy week, or level of fear of birth. Nulliparous women were more likely to accept participation than were parous women; 38% of the nulliparous women and 22% of the parous women were included in the final sample. In this trial, we did not assess or exclude on the basis of comorbid disorders, nor consider differences in the presentation of fear of birth. When also adopting a quite broad definition of fear of birth in terms of symptom severity (i.e. a relatively low cut-off point) the heterogeneity of the sample was obvious. Although sample heterogeneity could indeed threaten the internal validity (Nathan, Stuart, & Dolan, 2000), the heterogeneous sample may well enhance the external validity. When comparing the sample with the general birthing population in Sweden, we found it to be very similar.

Once included in the study, measurement attrition, especially when correlated with treatment assignment, is an important threat to internal validity (Shadish, Cook, & Campbell, 2002). In Study 1, more participants in the guided ICBT group did not respond to post-intervention and follow-up measures. Luckily, this dropout was not associated with any pre-intervention characteristic or level of fear of birth at screening or pre-intervention. In Studies 3 and 4, the amounts of missing data were very low.

**Treatment conditions**

Several different comparative outcomes are commonly used in randomized controlled trials evaluating psychotherapeutic interventions. In their meta-analysis of control conditions in depression trials, Mohr et al. (2014) have classified these into seven categories: no-treatment control, wait-list control, treatment as usual, non-specific factors component control, specific factors component control, evidence-based active comparator, and placebo pill. Among these, wait-list control has been described as most common in early stages of research, although neither this form of control nor treatment as usual are said to be particularly informative (Öst, 2016). Studies with some sort of placebo treatment are rated higher, while comparisons with empirically supported interventions have the highest ranking (Öst, 2016). In Study 1, standard care was most similar to the condition of treatment as usual,
but with some modifications (e.g. direct referral to counseling). The choice of control condition was restricted by practical limitations. Wait-list control would be difficult due to the limited time of pregnancy. Also, since the empirical support for the existing model of care is limited, comparisons with this condition could not be viewed as an active comparator. An alternative design could have been to evaluate guided ICBT as an extension to treatment as usual, using no treatment or a non-specific treatment as control condition.

In the current design, neither equality in treatment hours, nor manualization of the control condition were taken into consideration. There was no control over other forms of treatment, including treatment crossover. Researchers were non-blinded, and there was no monitoring of therapist adherence or analysis of therapist effects.

**Treatment adherence**

Low adherence has been described as one of the fundamental challenges in the evaluation of eHealth applications (Eysenbach, 2005). This was certainly the case in the RCT presented in Study 1, where the remarkably low adherence to treatment in the guided ICBT group is an obvious limitation. Adherence to the full program was less than 1%, which is well below the 50-100% reported in a systematic review of adherence to treatment in Internet interventions for anxiety and depression (Christensen, Griffiths, & Farrer, 2009), and more in line with figures of adherence reported in evaluations of early open access websites (Christensen, Griffiths, Korten, Brittliffe, & Groves, 2004; Farvolden, Denisoff, Selby, Bagby, & Rudy, 2005).

Unfortunately, we know very little about the reasons behind this low adherence. While most participants did not report any reason for not engaging in the program, some reported reduced levels of fear, changes in their life circumstances, having received other forms of treatment, time constraints, or problems when using the online portal. These reasons match the reasons commonly reported in online trials (Christensen et al., 2009). We might further assume the low adherence to be related to characteristics of the treatment provided, characteristics of the individual participants, and characteristics of this population in general. Non-adherence to guided ICBT has previously been reported as being linked to incompatible relationships between aspects of the patient’s situation and how the treatment is perceived (Johansson, Michel, Andersson, & Paxling, 2015). For example, such incompatible relationships could be between lack of time, energy, or capacity and the perception of the content as extensive, difficult or demanding, between personal vulnerabilities and a wish to avoid aversive emotional
experiences, and the perception of negative side effects from the treatment (e.g. treatment exercises that trigger anxiety), or between lack of face-to-face contact while perceiving a need for such (Johansson et al., 2015). All of these might well be the case in our study.

We also have reason to reflect on the specific situation of pregnant women. First, the transient nature of pregnancy, and the fact that most women do not give birth more than 1-3 times, might have implications for the motivation for treatment. Since the aversive experience is expected to stop after giving birth, endurance of fear or anxiety might be viewed as a reasonable option. From a behavior economist perspective, this might be the case when the intervention offered is as demanding as guided ICBT. Second, the wish for a planned cesarean birth, visits to the labour ward, and reassuring promises (e.g. promises of early pain relief, induction of labor or conversion to a cesarean birth if vaginal birth is too demanding) may also favor taking part in standard care rather in guided ICBT. Third, might it be so that these women do not frame their experience as a “psychological problem”, but rather as a natural response to lack of information, structural problems in maternity care, physical limitations of the own body, or limitations in a woman’s right to make decisions concerning her own body? If they do not perceive their fear as a “psychological problem” it seems reasonable not to wish for psychological treatment. Furthermore, if they define their problem as medical rather than psychological, the credibility of psychological interventions is probably restricted. Although the flexibility inherent in Internet-delivered therapy was thought to suit this population, other aspects of the treatment and its format might thus be less suitable, at least for the majority of women experiencing high levels of fear of birth.

The design of the study might also have contributed to the low adherence. Since almost 20% of the participants already scored below the cut-off point used for inclusion at pre-intervention, one could easily argue that we might have over-included participants with fear levels lower than expected. With regard to the content of the treatment, we also have reason to be self-critical with regard to the first modules, in which we did not succeed in motivating the users to work with the program.

Given the low adherence, we cannot claim to evaluate the efficacy of the guided ICBT treatment, since very few of the participants have taken part in the program. If willing to accept that limitation, I would still argue that our results - even the low adherence in itself - can make an important contribution. The findings in Study 1 do not support to the conclusion drawn by Nieminen et al. (2016), i.e. that Internet-delivered CBT has potential in the treatment of
fear of birth. This might of course be entirely due to limitations in our study design and treatment protocol. Nevertheless, the low adherence in Study 1 at least points to the difficulties in implementing guided ICBT in a clinical setting.

We have limited data on the number of women who actually received standard care. Of 131 women randomized to standard care, we have self-report data on 79 (60%). Of these, 3 women (4%) reported not having received any treatment. Data on treatment crossover are just as limited. Four out of 79 responding women in the SC-group (5%) reported additional counseling with a psychologist. Since the format of standard care differs, it is difficult to state the number of women in the guided CBT group who also received that form of care. In their responses to an open-ended question, many women reported having talked to their antenatal midwife about their fear. Five of the 55 responding women in the guided ICBT group (9%) explicitly reported having received the fear of birth-specific midwife counseling that was defined as standard care in this trial.

What can we learn from the experiences of Study 1? Numerous things could have been done differently. We could have had better ways of monitoring treatment adherence in standard care. We could have included measures of motivation for treatment as well as treatment acceptability and credibility. We could have had more stringent criteria for inclusion and exclusion. We could have shortened and simplified the written self-help material and included more videos and auditory material. But above all, I wish we had included pregnant women with fear of birth in the planning of the study and in the development of the intervention. I also wish we had had the time to pilot the treatment before launching the randomized trial.

Outcomes

In this thesis, fear of birth is the main focus; it is an outcome implicitly understood to be of importance in itself. However, one might argue that fear of birth, in itself, does not matter. Since fear and anxiety are normal emotional responses to threat, the implications of such reactions might be of greater importance than the pure existence of the response. Fear of birth could then be viewed as one of many possible predictors of other important outcomes, such as maternal morbidity, reduced quality of life, unnecessary cesarean sections, infant birth outcomes, attachment with the child, child development, or increased societal costs.

Quality of life has emerged as a central health component, and several tools are being used to assess individual ratings of (health-related) quality of
life. Although an association between fear of birth and quality of life during pregnancy seems very likely, this association is not well explored, and there is still a lack of valid and reliable measures of quality of life during pregnancy (Mogos, August, Salinas-Miranda, Sultan, & Salihu, 2013). In an attempt to formulate a pregnancy-specific measure of quality of life, Vachkova, Jezek, Mares, and Moravcová (2013) developed the tool QOL-GRAV, and found its internal consistency and variability satisfactory. One of seven items in QOL-GRAV asks specifically for ratings of the extent to which a pregnant woman fears that she will not manage labor. In another study, 19% of women answered that they feared this very much or to a great extent (Mázuchová, Kelčíková, & Dubovická, 2018). Future initiatives to assess consequences of fear of birth should definitively seek to address its impact on quality of life during pregnancy.

As concluded in the WHO Statement on Cesarean section rates (2015, p. 1), “every effort should be made to provide cesarean sections to women in need”. However, since cesarean sections also can cause significant complications, disability or even death, they should only be performed when medically necessary. With increasing rates of cesarean sections worldwide (Betrán et al., 2016), many times to levels that may not be medically justified, and with increased risks of adverse maternal outcomes if performed in the absence of medical indications (Souza et al., 2010), reducing medically unnecessary caesarian sections is an important healthcare target. This outcome has not been of central importance in this thesis, but both preferred and actual mode of birth were secondary outcomes in the U-CARE Pregnancy trial. During pregnancy, preference for cesarean birth was reduced from 36% to 12% in the guided ICBT group, and from 24% to 20% in the group who received standard care (Larsson et al., 2017). Actual birth modes did not differ between the groups; 65% had a normal vaginal birth, 9% an instrumental vaginal birth, 7.5% a planned cesarean section, and 18.7% an emergency cesarean section. Hence, the overall rate of cesarean sections is definitely higher than the 2016 national mean of 17.6% (Socialstyrelsen, 2018), and the 10% rate associated with obvious decreases in maternal and newborn mortality (WHO, 2015). However, WHO does not suggest that a 10% rate of cesarean sections is optimal. Instead, they open up for the possibility of other important outcomes besides mortality. Hence, if a cesarean section rate higher than 10% could be related to reductions in other important outcomes (e.g. less maternal morbidity, also including psychosocial health, mother-infant relationship etc.) it might still be medically justified. It is still unclear what the natural base rate of medically necessary cesarean sections might be, especially when allowing
a wider definition of outcomes than purely reductions in mortality. It might be that high levels of fear of birth, that for the individual woman cannot be reduced with non-medical interventions, might be viewed as a form of indirect maternal morbidity (Chou et al., 2016), legitimizing a cesarean section. Although this might be the case for some women reporting high levels of fear of birth, there are likely to be subgroups of women for whom interventions, whether targeting fear of birth or other psychosocial factors, are needed to reduce unnecessary medical procedures.

Infant and child outcomes have not been extensively studied with regard to fear of birth, and associations with adverse outcomes generally are not shown, even in largescale cohort studies (Laursen et al., 2009; Räisänen et al., 2014). However, the importance of also assessing child outcomes is indicated by mounting evidence associating perinatal distress in general with a wide range of negative child outcomes, such as preterm birth and low birth weight, gray matter alterations, impairments in cognitive and motor development, difficult temperament, emotional and behavioral problems, and clinical disorders (Entringer, Buss, & Wadhwa, 2015; Glover, 2014; Graignic-Philippe, Dayan, Chokron, Jacquet, & Tordjman, 2014; Stein et al., 2014). In the U-CARE Pregnancy trial, data on child outcomes were not collected.

With regard to additional costs associated with fear of birth, a recent Swedish study has shown 38% higher perinatal costs for the care of women with severe fear of birth, compared to women with low levels of fear (Nieminin et al., 2017). In the U-CARE Pregnancy trial, we considered including cost of treatment as a secondary outcome, although we did not do so.

Altogether, several outcomes are of importance when investigating issues relating to perinatal health and care. Interestingly, the outcome that appeared as most interesting in Study 1 was neither of these, nor our primary outcome fear of birth, but rather treatment adherence as discussed above.

**Statistical issues**

In order to make use of all available data, Linear Mixed Models analysis was the principal analysis of Study 1. Building on a likelihood-based approach, this form of analysis produces unbiased parameter estimates under the assumption of data being missing at random (Gueorguieva & Krystal, 2004; Lane, 2008; Verbeke & Molenberghs, 2000). In Studies 3 and 4, there was a very small proportion of missing data (less than 1%) and data were missing completely at random. Since individual mean imputation produces favorable results when the amount of missing data does not exceed 20% (Shrive, Stuart,
Quan, & Ghali, 2006), it was used for item nonresponses up to 20% of each scale in these studies.

Some important limitations are inherent in the analyses used in Studies 3 and 4. First, cluster analysis is a strictly descriptive or exploratory analysis, that is completely determined by the variables included in the cluster variate. Regardless of whether or not there are apparent clusters within the data, cluster analysis will always generate clusters. It is thus of great importance to examine if the clusters shown are relevant, in this case from a clinical or theoretical point of view. Second, Study 4 is an observational study, in which correlational analyses of cross-sectional data are conducted. Although it may be tempting to draw conclusions of causality based on linear and logistic regression analyses, these analyses do not allow for such inferences – especially when conducted on cross-sectional data only. Both of these studies might have benefitted from using more complex statistical procedures building on Structural Equation Modeling. At this stage of research, our aim was not to establish precise sub-categories of fear of birth or a comprehensive psychological model of the concept, but rather to explore the possibility of within group heterogeneity and possible mechanisms that could be used in future research. Cluster analysis and multiple regression were found to serve these purposes.

Methodological issues in literature reviews

Literature reviews can be categorized in a number of ways, using different labels and criteria (Grant & Booth, 2009). A basic distinction can be made between systematic and narrative literature reviews (Ferrari, 2015; Green, Johnson, & Adams, 2006). According to the Preferred Reporting Items for Systematic reviews and Meta-Analyses, also called the PRISMA guidelines, a systematic review “is a review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyze data from the studies that are included in the review” (Moher, Liberati, Tetzlaff, & Altman, 2009, p. 1). A narrative review also aims at identifying and summarizing previously published findings, but while the topic of a systematic review needs to be very specific, a narrative review allows for a broader perspective (Ferrari, 2015).

Along with the PRISMA guidelines, a 27-item checklist is provided for the reporting of a systematic review (Moher et al., 2009). For narrative reviews, such guidelines have not been presented (Ferrari, 2015). The rigor of a systematic review or meta-analysis is clearly superior when there are several available studies that test the same hypothesis or evaluate similar treatment
alternatives. When that is not the case, narrative reviews can make important contributions in linking many studies on different topics (Baumeister & Leary, 1997). Although systematic procedures are not required for a narrative review, it is of course beneficial to apply an approach that is as systematic as possible.

The objective of Study 2 was not found to be specific enough to conduct a systematic review. Instead, our intention was to explore a large number of studies on fear of birth, all with different research questions and methodologies. We found this objective to be more in line with the concept of a narrative review. Since subjectivity in the inclusion of articles is one of the main weaknesses of narrative reviews (Ferrari, 2015), we used a structured approach for searching and including papers. For this reason, we used a specified search strategy, that was presented in the article. We also specified and reported criteria for the inclusion and exclusion of papers, and showed a flow-diagram with the details of this process.
8 Conclusions and clinical implications

When summarizing the results of this work, women fearing birth do not seem to be a homogenous group. Although some differences were found between primiparous and multiparous, parity did not emerge as a central variable contributing to differences in women’s reports of fear of birth. Neither were the psychological profiles of women reporting high levels of fear of birth particularly different when comparing primiparous and multiparous women. As indicated in Study 3, heterogeneity in the population may instead be related to other variables.

Heterogeneity among women reporting high levels of fear of birth implies that the interventions provided in health care are likely to be more efficient if they are broad or flexible enough to meet a wide range of needs. To date, we know very little about the possibility of grouping women with fear of birth into subgroups based on variations in their psychological characteristics or the presentation of fear or anxiety, and we are far from having a psychological model of fear of birth. Until we know more about these things, individual assessment of the circumstances and needs of each woman may be our best guide to provide interventions that she might find helpful. Such ideographic case formulations have long been used when building interventions on the core principles of CBT, rather than on specific treatment manuals. Taking individual differences into account has also been proposed as an important development in order to personalize transdiagnostic treatment approaches (Craske, 2012; Meidlinger & Hope, 2017). If letting the findings of the empirical Studies 1, 3, and 4, as well as the findings of the literature review in Study 2 guide us, such an assessment might include, for example:

- Repeated assessments of the level of fear of birth, and considerations regarding any changes in the experience
- Asking questions about previous birth experiences, other obstetric experiences (e.g. assisted reproduction, miscarriage, abortion), and health care experiences in general
- Exploration of life situations or life events that may be related to the experience of fear of anxiety (e.g. violence and abuse, lack of support, giving birth in an unfamiliar culture, language difficulties)
- Assessment of symptoms relating to emotional disorders, e.g. post-traumatic stress, depression, or blood and injection phobic anxiety
- Functional analysis of cognitive aspects of fear and anxiety (e.g. catastrophizing cognitions, intolerance of uncertainty, and positive
beliefs about worry) as well as maladaptive behaviors functioning to avoid the feared situation, aspects of the feared situation, or the aversive emotional experience in itself (e.g. avoidance of situations that might trigger fear or anxiety and behaviors used for reassurance or distraction)

- Assessment of the level of functional impairment, and to what extent the women feels capable of handling her fear. Does the women wish for any form of support or treatment, and what kind of support or treatment does she think might be of help to her?

There are still very few studies that evaluate interventions for fear of birth, and in these there is no clear pattern of some interventions outperforming others in their effect. This was also the result shown in Study 1 of this thesis, where fear of birth decreased in a similar way regardless of treatment allocation. In the absence of evidence-based treatment models, an individualized intervention plan, based on the assessment of needs and circumstances of each woman, might be considered for women in this heterogeneous group. If adopting a general treatment approach for all women reporting high levels of fear of birth, one might need to choose an approach that is broad and/or flexible enough to meet the diversity of the group. Models of stepped care or cooperative efforts between midwives, obstetricians and psychologists might be interesting alternatives.

Despite the low adherence of guided ICBT in Study 1, this cannot be taken as proof of the uselessness of CBT for women fearing birth. Before dismissing guided ICBT, or CBT in general, as potential treatment approaches for fear of birth, we must consider the possibility that other variables than the principles of cognitive behavior therapy accounted for the low adherence in Study 1. For example, the format of treatment (a self-help program delivered over the Internet), the specific content and tone of this particular self-help material, or technical and user-oriented aspects of the U-CARE portal may all have played a part. We must also take into consideration factors that can moderate the individual’s motivation for treatment, e.g. the level of symptoms, other forms of support available, and care preferences. Guided ICBT might not attract all women fearing birth and could thus be difficult to implement to the complete population. From my perspective, guided ICBT should not be used to replace other models of care for fear of birth but may perhaps be offered as a complement to other interventions.

Although future research may be seen as a responsibility of the scientific community, psychologists, midwives and obstetricians working with women
fearing birth may well contribute to a deeper understanding of the concept and the development of new treatment models that can be evaluated scientifically. By adopting a scientist practitioner perspective with continuous evaluations of their work, such clinical experiences could be highly valuable.
9 Future directions

Many questions remain to be asked and explored with regard to fear of birth. We still do not have a clear conception of the natural development of fear of birth during pregnancy. Does it generally subside over time without treatment, to what extent, and with what exceptions? We are also still far from having a psychological model of fear of birth, directing our attention to mechanisms that are central for the development and maintenance of fear, worry or anxiety of this kind. One way to move forward in this direction would be to explore the role of transdiagnostic mechanisms such as repetitive negative thinking and selective attention to external and internal threat. Yet another area in need of further exploration is the heterogeneity of women fearing birth. Could there be other potential subgroups in this population? How could their specific needs be described and met? One group that is very sparingly represented in the research literature is women with a fear so intense that they have chosen not to become pregnant. How could we identify and help these women?

With regard to the treatment of fear of birth, it could be interesting to include a partner and/or someone from the personal social network in the assessment and treatment. Social isolation seems to be a risk factor for experiencing fear, and there are studies showing that partners also experience this form of fear or anxiety. With such an approach, the partner and/or support person might also find a new role in supporting the women fearing birth, throughout pregnancy and during childbirth. Above all, I believe in evaluating individually-tailored interventions, that consider the differences among women fearing birth. In my view, models of stepped care or collaborative efforts between antenatal midwives, counseling midwives on the labor ward, obstetricians and psychologists are the most interesting future directions.
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