From Department of Clinical Neuroscience,
Karolinska Institutet, Stockholm, Sweden

AM I MAD, BAD OR DANGEROUS? A NOVEL INTERVENTION APPROACH FOR UNWANTED INTRUSIVE THOUGHTS

Klara Olofsdotter Lauri

Karolinska Institutet

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Am I mad, bad or dangerous? A novel intervention approach for unwanted intrusive thoughts

Thesis for Doctoral Degree (PhD)

By

Klara Olofsdotter Lauri

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Principal Supervisor:
Associate professor Erik Andersson
Karolinska Institutet
Department of Clinical Neuroscience

Co-supervisors:
PhD Kristina Aspvall
Karolinska Institutet
Department of Clinical Neuroscience

Professor David Mataix-Cols
Karolinska Institutet
Department of Clinical Neuroscience

Professor Eva Serlachius
Lund University
Department of Clinical Sciences

Professor Christian Rück
Karolinska Institutet
Department of Clinical Neuroscience

Opponent:
Professor Jonathan Abramowitz
University of North Carolina at Chapel Hill
Department of Psychology

Examination Board:
Professor Maria Tillfors
Karlstad University
Department of Social and
Psychological Studies

Associate professor Monica Buhrman
Uppsala University
Department of Psychology

Associate professor Benjamin Bohman
Karolinska Institutet
Department of Clinical Neuroscience

To David, Frank, Judit and Vibeke.

Question everything. Learn something. Answer nothing.

Euripides (c. 480 – c. 406 BC)

Popular science summary of the thesis

Most of us experience unwanted intrusive thoughts from time to time. The thoughts can include taboo themes, such as harming another person, unwanted or unacceptable sexual conduct, or blasphemy. Even though these unwanted thoughts can be frightening or disturbing, most of us just shrug them off as weird or unimportant. But for some, letting the thoughts just go by is much more difficult. If a person interprets the thoughts as personally significant, dangerous, or immoral, it can lead to excessive levels of anxiety and distress. In their most extreme form, unwanted intrusive thoughts can be so distressing, impairing and time-consuming that the individual fulfils the criteria for obsessive-compulsive disorder (OCD), a psychiatric diagnosis including symptoms such as obsessions and compulsive behaviors.

One group of people who commonly experience high levels of unwanted intrusive thoughts are parents of infants and toddlers. Almost all new parents have thoughts or worries about terrible accidents happening to their baby. Around half of new parents have unwanted thoughts about intentionally harming the child. For example, it can be thoughts about throwing, suffocating, or burning the baby. The thoughts can be so intense and frequent that they affect the person's well-being and even their ability to take care of the child. Importantly, both OCD patients with taboo obsessions and parents with unwanted intrusive thoughts of infant-related harm are often unwilling to tell anyone about their thoughts. They are afraid that they would be judged as dangerous or mad, that they would be hospitalized, or that their child would be removed from their care.

Previous studies have shown that patients who have OCD with taboo obsessions may respond less well to recommended psychological treatments compared to OCD patients who experience other types of obsessions. For parents who suffer from unwanted intrusive thoughts about harming their child, there are no established treatments. Therefore, there is a need for novel intervention approaches for patients with OCD and taboo obsessions, and for individuals suffering from intrusive thoughts.

This thesis includes five research studies with the aim to develop and test a novel online intervention for patients who suffer from OCD with taboo obsessions and for parents of infants and toddlers who experience intrusive thoughts about harming their child. The intervention involves cognitive exercises, and focuses on helping the individual to change the interpretation of the thought from viewing the thought as immoral or personally significant, e.g., "*Thinking that I will hurt my baby means that I could actually be a danger to my child*", to more realistic and functional beliefs, such as *"These are just thoughts, and they don't say anything about me as a person".* By changing the interpretation, the thoughts can weaken or disappear. If the thoughts disappear, the individual's quality of life, well-being and daily function is expected to increase.

Results from the five research studies showed that the cognitive online intervention was effective in reducing OCD symptoms among OCD patients with taboo obsessions and in

reducing intrusive thoughts among parents of infants and toddlers. Importantly, the parents also experienced that their confidence in their ability to care for their child increased following the treatment. The intervention seemed to work by changing the negative appraisals of the thoughts. Both OCD patients with taboo obsessions and parents with unwanted intrusive thoughts were positive towards the online intervention, stated that they found it helpful, and most were able to work with the digital material and complete the intervention.

In conclusion, this novel online intervention could be a possible treatment alternative for OCD patients with taboo obsessions and for parents suffering from unwanted intrusive thoughts, who are reluctant or unable to access treatment, or who do not respond to standard psychological treatments.

Populärvetenskaplig sammanfattning

De flesta upplever då och då oönskade påträngande tankar. Tankarna kan innehålla tabubelagda teman, såsom att skada en annan person, oönskade eller oacceptabla sexuella beteenden eller hädelse. De flesta kan ganska snabbt skaka av sig tankarna och strunta i dom, men för en del personer är det mycket svårare att bara låta tankarna passera. Om en person tolkar tankarna som att de säger något viktigt om deras personlighet eller att tankarna är farliga och omoraliska så kan det leda till överdriven oro och ångest. I sin mest extrema form kan tankarna bli så plågsamma, störande och tidskrävande att personen uppfyller kriterierna för tvångssyndrom (OCD). OCD är en psykiatrisk diagnos som innebär att personen lider av tvångstankar och tvångshandlingar.

En grupp som kan uppleva höga nivåer av påträngande tankar är föräldrar till små barn. Nästan alla nyblivna föräldrar oroar sig över olika olyckor som skulle kunna drabba deras barn och ungefär hälften av alla föräldrar har även tankar om att de själva skulle kunna skada barnet. Det kan till exempel vara tankar om att kasta barnet från en hög höjd, att kväva eller bränna barnet. Tankarna kan vara så intensiva och komma så ofta att de påverkar förälderns välbefinnande och även förälderns förmåga att ta hand om sitt barn. Både OCD-patienter med tabutvångstankar och föräldrar med oönskade tankar om att skada sina barn är i många fall ovilliga att berätta för någon om sina tankar. Det beror på att de är rädda att de skulle bedömas som farliga eller galna, att de skulle utsättas för tvångsvård eller att de skulle förlora vårdnaden om sitt barn.

Tidigare forskning har visat att patienter med OCD och tabutvångstankar kan svara sämre på rekommenderad psykologisk behandling jämfört med OCD-patienter som upplever andra typer av tvångstankar. Det finns inga rekommenderade behandlingar för föräldrar som lider av oönskade tankar om att skada sitt barn. Därför finns det ett behov av nya behandlingsmetoder som kan nå OCD patienter med tabutvångstankar och personer som lider av påträngande tankar.

Den här avhandlingen innehåller fem forskningsstudier som syftar till att utveckla och testa en ny digital intervention för OCD patienter med tabutvångstankar och för föräldrar som lider av påträngande tankar om att skada sitt barn. Interventionen innehåller kognitiva övningar och fokuserar på att hjälpa individen att ändra sin tolkning av tankarna från att uppleva tanken som omoralisk eller farlig, exempelvis *”Att jag får tankar om att skada mitt barn kan betyda att jag faktisk är en fara för mitt barn*”, till en mer realistisk och funktionell tolkning, *”Det här är bara tankar, och de säger ingenting om mig som person.*" Genom att ändra tolkningen av de påträngande tankarna kan tankarna försvagas eller försvinna. Om tankarna försvinner kan personens livskvalitet, mående och funktion förbättras.

Forskningsstudierna som ingår i avhandlingen visar att den kognitiva digitala interventionen kan minska OCD-symtom hos OCD patienter med tabutvångstankar och påträngande tankar bland föräldrar. Interventionen ökade också föräldrarnas upplevda förmåga att ta hand om sitt barn. Interventionen vekar vara effektiv eftersom den förändrade de negativa tolkningarna av tankarna. Både OCD-patienter och föräldrar med påträngande tankar var

positivt inställda till den digitala interventionen och uppgav att de tyckte att den var hjälpsam. De flesta kunde utan problem arbeta med det digitala materialet och slutföra interventionen.

Sammanfattningsvis, den digitala kognitiva interventionen kan vara ett möjligt behandlingsalternativ för både patienter med OCD och tabutvångstankar och för föräldrar som lider av oönskade påträngande tankar, och som är ovilliga att genomgå, inte svarar på eller inte har tillgång till behandling.

Abstract

Background: Unwanted intrusive thoughts (UITs) containing unacceptable and taboo themes is regarded as a common and, for most, transient cognitive phenomenon. However, these thoughts can become so frequent and distressing that the individual's daily functioning and well-being are impaired, even to the extent that the individual fulfils the criteria for obsessive-compulsive disorder (OCD). Among parents of infants and toddlers, distressing and impairing UITs, mainly of infant-related harm, are a very common symptom. Patients who suffer from OCD with taboo obsessions as well as parents with UITs of infant-related harm are reluctant to reveal their thoughts to healthcare personnel, due to the shame or stigma related to the thought content. Some OCD patients with taboo obsessions avoid seeking treatment and may respond less well to standard psychological treatment for OCD. There are no recommended treatment options for the larger population of parents who suffer from UITs. Therefore, there is a need to develop alternative treatments targeting both taboo obsessions among OCD patients and UITs among parents of infants and toddlers.

Aims: The overall aim of this thesis was to develop and evaluate the effect and the mechanism of change of a novel, online intervention approach for OCD patients with taboo obsessions and for parents of infants and toddlers with distressing UITs of infant-related harm.

Method: The online intervention developed and investigated in this thesis was based on the cognitive model of obsessions, and was evaluated among patients with OCD and taboo obsessions and parents of infants and toddlers with distressing UITs of infant-related harm. Study I was a pilot study including 19 patients with OCD, primarily taboo obsessions. The participants received therapist-supported online cognitive therapy (I-CT) for 10 weeks.

Study II was a randomized controlled trial with a mediation analysis including 68 OCD patients with taboo obsessions. Participants were randomized to either the therapist-supported I-CT for eight weeks or control condition containing online general psychological support.

Study III was a cross-sectional survey study including 594 parents of infants and toddlers.

Study IV was a randomized controlled pilot trial with a mediation analysis including 43 parents of infants and toddlers who reported daily distressing UITs about intentionally harming their child. Participants were randomized to either eight-week self-guided I-CT or waiting-list control.

Study V was a qualitative interview study using thematic analysis to investigate parents' experiences of taking part in the self-guided I-CT for parents with excessive levels of UITs.

Results: Results from Study I showed that intervention completion was high and that most participants were satisfied with the I-CT intervention. I-CT was associated with a large reduction in OCD-symptom severity (bootstrapped within-group d = 1.67 [95% CI; 0.67 to 2.66]). The effect was driven mainly by the participants who understood and were able to apply the cognitive model to their own situation. A time-series analysis indicated that the

reduction of OCD-symptom severity was preceded by a reduction in negative appraisals of the taboo obsessions.

In Study II, participants in both the I-CT group and the control condition had a significant reduction of OCD-symptoms from pre- to post-intervention. The reduction of OCD-symptoms was significantly larger in the I-CT group, with a moderate effect size (bootstrapped between-group *d* = 0.69 [95% CI; 0.20 to 1.19]). The mediation analysis revealed that 55% of the treatment effect was mediated by a reduction in negative appraisals.

In Study III, 56% of the parents' reported experiencing or previously having experienced UITs about intentionally harming their child. For around one fifth of the parents the UITs were difficult to control and/or had a negative impact on their relationship or attachment to the child. Positive attitudes toward internet-delivered interventions for UITs were endorsed by 51% of the parents.

Study IV showed that participants randomized to the self-guided I-CT had a significantly larger reduction of UITs compared to participants in the waiting-list control condition (bootstrapped between-group *d* = 0.99 [95% CI; 0.56 to 1.43]). The effect of the intervention was mediated by a reduction in negative appraisals.

The thematic analysis conducted in Study V divided the parents' experiences of the self-guided I-CT into two main themes: (1) Changed perception of the unwanted intrusive thoughts, and (2) Different paths to recovery. Overall, results showed that the parents believed that the intervention was helpful by changing the way they interpreted their thoughts, and they reported experiencing several benefits in their daily life due to the intervention.

Conclusions: I-CT targeting UITs is an acceptable and feasible intervention, both delivered in a therapist-guided format for OCD patients with taboo obsessions and in a self-guided format for parents with UITs of infant-related harm. Results from Studies I, II and VI suggest that the intervention is effective in reducing distressing and impairing taboo obsessions and UITs. The effect appears to be mediated by a change in negative appraisals. The online cognitive intervention is therefore a promising complementary intervention alternative to standard psychological treatments for OCD patients with taboo obsessions, and an easily accessible, scalable intervention for the large population of parents suffering from UITs.

List of scientific papers

I. **Olofsdotter Lauri, K.,** Aspvall, K., Bagøien Hustad, I., Malmqvist, K., Serlachius, E., Mataix-Cols, D., Rück, C., Ivanov, V., & Andersson, E. (2022). Initial evaluation of a therapist-supported online cognitive therapy self-help for patients with taboo obsessions. *British Journal of Clinical Psychology*, *61*(4), 964-982.

II. **Olofsdotter Lauri, K.,** Aspvall, K., Lybert, N., Samuelsson, C., Liliequist, B., Håkansson, E., Serlachius, E., Rück, C., Mataix-Cols, D., & Andersson, E. Efficacy and mediators of online cognitive therapy for taboo obsessions in adults with obsessive-compulsive disorder: Randomized Controlled Trial. *Unpublished manuscript.*

III. **Olofsdotter Lauri, K.,** Aspvall, K., Serlachius, E., Mataix-Cols, D., Rück, C., & Andersson, E. (2022). Perceived need of psychological support for taboo obsessions in new parents: A cross-sectional survey. *Journal of Obsessive-Compulsive and Related Disorders*, *34*, 100733.

IV. **Olofsdotter Lauri, K.,** Aspvall, K., Mataix-Cols, D., Serlachius, E., Rück, C., & Andersson, E. (2023). An online self-guided cognitive intervention for unwanted intrusive thoughts about harming infants in new parents: initial randomised controlled trial with mediation analysis. *Cognitive Behaviour Therapy*, 1-18.

V. **Olofsdotter Lauri, K.,** Bragesjö, M., Aspvall, K., Lybert, N., Samuelsson, C., Serlachius, E., Rück, C., Mataix-Cols, D., & Andersson, E. "I'm not afraid to be alone with the baby now": Parents' experiences of an online self-guided cognitive intervention for unwanted intrusive thoughts about harming their child. *Unpublished manuscript.*

Contents

List of abbreviations

CBT	Cognitive behavioral therapy
CSQ	Client Satisfaction Questionnaire
CT	Cognitive therapy
ERP	Exposure and response prevention
GWAS	Genome-wide association study
I-CT	Online cognitive therapy
OCD	Obsessive-compulsive disorder
OCS	Obsessive-compulsive symptoms
PSS	Personal Significance Scale
PTBC	Parental Thoughts and Behaviors Checklist
RCT	Randomized controlled trial
SMT	Stress management training
SSRI	Selective serotonin reuptake inhibitors
UITs	Unwanted intrusive thoughts
Y-BOCS	Yale–Brown Obsessive–Compulsive Scale

Introduction

Unwanted intrusive thoughts (UITs) are ego-dystonic, spontaneous, and interfering thoughts, mental images, or impulses. In their classic study, Rachman, De Silva [1] were the first to show that UITs are experienced by most individuals, clinical and non-clinical samples alike. Since their study, the notion that obsessions exist in a continuum, from normal, intrusive thoughts to obsessions, has been established as a core component of cognitive treatment models of obsessive-compulsive disorder (OCD) [2-5]. The content of the thoughts seems to be essentially the same, but the frequency of, the ability to control the thoughts, and the distress associated with them differs between individuals. There are competing views, arguing that obsessions are not specifically associated with normally occurring intrusions [6,7], but Rachman and De Silvas original findings have been replicated, showing that non-clinical samples all over the globe experience UITs [8-17].

For more than four decades, cognitive behavioral therapy with exposure and response prevention (CBT/ERP) has been shown to be an effective treatment for OCD [18]. With the development of internet-delivered CBT/ERP as an effective treatment alternative to face-to-face treatment [19,20], the accessibility of evidence-based treatments for OCD has increased. OCD is a heterogenic disorder, including a range of different symptom dimensions, and the efficacy of treatment seems to differ between these dimensions [21-24]. For OCD patients with taboo obsessions, e.g., ego-dystonic, aggressive, sexual, and/or religious obsessions, exposure-based treatment may be less effective and acceptable, by both patients and clinicians [21-25]. Additionally, since obsessions exist on a continuum of normally occurring thoughts, there are individuals who experience high levels of disabling UITs but do not necessarily fulfil the criteria of OCD. For these individuals, and for individuals who are reluctant or unable to access treatment, there is a need for alternative treatments options.

This thesis focuses on developing new intervention approaches, targeting the single symptom of unwanted intrusive thoughts. I hope that it can contribute to broaden the view of how psychological treatments can be utilized, both within the regular healthcare system and in society at large, reaching individuals on a wider part of the continuum of unwanted intrusive thoughts.

Klara Olofsdotter Lauri, Kärrtorp, December 2023

1 Literature review

1.1 Taboo obsessions: A dimension of obsessive-compulsive disorder

1.1.1 Obsessive-compulsive disorder

Obsessive-compulsive disorder (OCD) is a psychiatric disorder characterized by the presence of obsessions and compulsions. Obsessions are intrusive, recurrent, and persistent thoughts, urges, images, or impulses that the individual tries to ignore or suppress by performing compulsions. Compulsions are repetitive overt or covert behaviors, aimed mainly at reducing or preventing the distress caused by the obsessions [26].

The lifetime prevalence of OCD is estimated at 1.3% [27], and if left untreated the disorder tends to follow a chronic course for many individuals [28]. It can be a severely impairing disorder. For example, patients with OCD are 50% less likely to access and finish secondary school [29] and 44% of OCD patients have difficulties in participating in the labor market. The corresponding number in the general population is 16% [30]. Additionally, patients with OCD have a higher mortality risk than the general population [31] and two Swedish population-based studies have shown that OCD was associated with up to a five-fold risk of attempting suicide and a four to 10-fold risk of death by suicide [32,33].

1.1.2 OCD symptom dimensions

OCD is a heterogenous condition, and patients can display a range of different symptom patterns. Several studies have used factor analysis to identify meaningful symptom dimensions of OCD. Baer [24] conducted the first factor-analysis of the Yale-Brown Obsessive-Compulsive Scale symptom checklist (Y-BOCS) [34] in a sample of 107 OCD patients, identifying a three-factor structure: “symmetry/hoarding”, “contamination/cleaning”, and “pure obsessions”. A four-factor structure has later been suggested by several studies, including the symptom categories “symmetry/ordering”, “hoarding”, “contamination/cleaning”, and “obsessions/checking” [35-37] or ”symmetry”, ”forbidden thoughts”, ”cleaning”, and ”hoarding” [38]. Important in this particular context, several studies have provided support for a five-factor model that also includes the symptom category “unacceptable thoughts” or “taboo thoughts”[39-42]. A recent large multinational cohort study including children, adolescents, and adults (*n* = 1,366), found eight symptom dimensions: “disturbing thoughts”, “incompleteness”, “contamination”, “hoarding”, “transformation”, “body focus”, “superstitions”, and “separation/loss”. The disturbing thoughts dimension also included taboo thoughts [43].

1.1.3 The phenomenology of taboo obsessions

Research studies have estimated that around 80-94% of the general population experience unwanted intrusive thoughts (UITs) [1,8,9,11,14]. For some, the thoughts become so frequent and distressing that they fulfill the criteria for OCD. Taboo thoughts or obsessions is a common symptom dimension among OCD patients [44-47]. Taboo obsessions are aggressive, sexual

and/or religious obsessions, containing unacceptable or taboo themes such as incest, pedophilia, blasphemy, or harm thoughts [40,45]. The thoughts are ego-dystonic, i.e., inconsistent with one's self-concept and beliefs. Taboo obsessions have previously been referred to as "pure obsessions", due to the early misconception that individuals suffering from taboo thoughts do not engage in compulsions [24]. Later research has shown that taboo thoughts are in fact accompanied by compulsions, mainly mental compulsions and rituals, as well as reassurance seeking [48,49].

Among patients with OCD, taboo obsessions are associated with higher levels of shame, depression, distress, time spent on obsessions, self-reported anxiety, social anxiety disorder and thought control strategies than other symptom dimensions of OCD [43-45,50-52]. Taboo obsessions have also been associated with higher risk of suicidality [53,54].

1.2 Unwanted intrusive thoughts about infant-related harm among parents

Many parents experience increased levels of worry and anxiety during pregnancy and after their child is born. The prevalence of anxiety disorders among pre- and postpartum women has been shown to be up to 20.5% [55-57], and the occurrence of reported mental health issues among postpartum women has increased from 18.4 to 40.4 per 1,000 women, measured in the USA between the years 2006 and 2015 [58].

The perinatal and postpartum periods have been associated with an elevated risk of developing obsessive-compulsive symptoms (OCS) compared to the general female population [59,60], however, these results are mainly based on retrospective data. Leckman et al. 1999 [61] was the first study to show that new parents experience symptoms closely related to obsessive compulsive symptoms, with mental preoccupation surrounding the newborn. This finding is supported by later research, showing that UITs about accidental or intentional infant-related harm is a frequent symptom experienced in the postpartum period [62-64]. Interestingly, research has estimated that as many as 100% of new parents experience thoughts of accidental harm and around 50% of new parents experience UITs about intentionally harming their infant [65-69]. Approximately 2.5-9% of new parents fulfil the criteria for OCD [57,59,68,70,71]. As previously described, UITs are ego-dystonic and thus exaggerated fears. Hence, there is no increased risk of the parent acting on these intrusive thoughts [65,72]. Some prospective studies have shown that the levels of OCS postpartum seem to persist over time if not treated [68,73].

1.2.1 The phenomenology of UITs among parents

UITs of intentional harm among parents are associated with a higher degree of parental stress than other forms of obsessions (e.g., fear of germs) [74], increased rates of depression [67,75,76], anxiety and impaired self-confidence [68,77], as well as negative impact on quality of life, personal relationships and parental self-efficacy, i.e., the parents' confidence in their ability to care for their infant [78-81]. Impaired parental self-efficacy may in turn lead to mental health problems during parenthood, such as OCD, depression and anxiety [82].

The vast majority of research studies investigating postpartum UITs and postpartum OCD have only included mothers, even though some studies suggest that fathers have comparable rates of UITs related to their child [67,83-85].

1.3 Etiology of OCD and taboo obsessions

1.3.1 Biological correlates

The exact causes of obsessions and compulsions have not yet been determined. OCD is a heritable condition, with about 40-50% of the phenotypic variance attributed to genetic factors [86-90]. Previous research has suggested that OCD is a polygenetic disorder, with several loci (location of a specific gene/genetic marker on the chromosome) contributing to the development of the disorder [91,92]. Two genome-wide association studies (GWAS) and one meta-analysis have attempted to identify specific genetic factors associated with OCS, but no conclusive results have been found due to lack of power [91,93,94]. One ongoing study, including the largest sample to date in a GWAS investigating OCD, 14,140 OCD cases and 562,117 controls, has identified the first significant locus for OCD, explaining 16% of OCD heritability [95]. In addition to common genetic variation, recent research also suggests that large, rare copy number variants also contribute to the disorder [96].

A number of different environmental risk factors have been suggested for OCD. Several perinatal factors, such as pregnancy and the postpartum period, have been associated with the development and exacerbation of OCD symptoms [97], especially in the case of taboo obsessions [98]. However, it is important to keep in mind that no specific environmental factors have been conclusively shown to causally affect the development of OCD. Their identification would be particularly important for prevention efforts, and further research to fully understand how genetic and environmental factors interact has been highlighted [92,99].

Even though all OCD subtypes have common environmental and genetic causes, there is some evidence suggesting that there are specific pathophysiological and etiological factors behind each symptom dimension [100,101]. However, more extensive research is needed to establish which genetic and environmental risk factors are common to all individuals with OCD, and which are symptom dimension-specific. To date, the strongest evidence for an etiologically meaningful subtype is tic-related OCD, which is far more familial than non-tic related OCD [102].

1.3.2 The cognitive model of obsessions

Salkovskis [5] presented the first cognitive conceptualization of OCD, a model that was further developed by Rachman [2,3]. The cognitive model of obsessions assumes that obsessive thoughts are part of a continuum from normal intrusive thoughts to obsessions [1]. The model stipulates that erroneous and catastrophic appraisal of intrusive thoughts are important in the development and maintenance of obsessions. Appraising intrusive thoughts as immoral, dangerous, or personally significant may to lead to elevated anxiety. For example, if a parent interprets an unwanted thought about throwing their infant out of a window as indicative of that he/she is a bad person or that he/she might perform such a behavior in the future, the

thought itself will lead to high levels of distress compared to if the parent considered the thought in the same as any other thought. The elevated distress and anxiety may in turn make the individual motivated to engage in behaviors such as thought suppression, avoidance or excessive checking, behaviors which fuel the obsessions even more [2,3].

The importance of negative appraisals of intrusive thoughts has been highlighted in several studies. Corcoran, Woody [103] indicated that intrusions containing sexual and aggressive themes are apprised as more personally significant and occur more frequently. In this study, negative appraisals of the intrusive thoughts were also correlated with obsessive-compulsive symptoms. In a longitudinal study by Abramowitz, Nelson, Rygwall, Khandker [85], it was shown that erroneous appraisals of otherwise benign intrusive thoughts was the strongest risk factor for elevated levels of obsessions. A mediation analysis was conducted by Woody, Whittal, McLean [104] using data from a previously conducted randomized controlled trial (RCT) study that evaluated the effect of CBT compared to stress management training on obsessions [105]. Results from the mediation analysis suggested that a change in negative appraisals mediated a reduction of obsessions. However, a subsequent time-lagged analysis indicated the opposite relationship, i.e., that a change in obsessions preceded a change in negative appraisals [104]. Conflicting results were found by Andersson [106], showing that an increase in obsessive beliefs seemed to mediate the effect of internet-delivered CBT for patients with OCD. Additionally, higher levels of negative appraisals of intrusive thoughts have also been identified as associated with higher levels of unhelpful behavioral responses to the intrusions, such as avoidance [107].

1.4 Etiology of postpartum OCD

1.4.1 Biological correlates

There are biological theories suggesting that hormonal changes occurring during pregnancy and postpartum may explain a large proportion of the development of OCS during the perinatal period. For example, pregnancy may lead to decreased levels of estrogen and progesterone, which in turn can affect the serotonin regulation, which is a biological marker relevant for the development of OCD [100]. Similarly, oxytocin increases drastically during both pregnancy and postpartum, which in turn have been positively associated with OCD severity [108]. One study observed an association between higher levels of adrenocorticotropic hormone and thoughts about harming the infant among mothers who had given birth within 48 hours, suggesting that the development of taboo thoughts in the postpartum period may be due to a dysregulation of the hypothalamic-pituitary-adrenal axis [109]. All these studies have only included mothers. As mentioned above, fathers seem to develop UITs to a similar extent as mothers during the postpartum period [67,83-85], despite no significant hormonal and physiological changes. The proposed biological markers may therefore not fully explain the etiology of postpartum taboo obsessions.

1.4.2 Psychological model of postpartum OCD

Fairbrother and Abramowitz [110] presented a cognitive-behavioral model specific to the development of postpartum OCD. The model holds many similarities with Rachman's cognitive model of obsessions [2,3], with additional specific aspects of postpartum OCD, such as the rapid onset soon after birth and predominance of taboo obsessions relating to the child and accompanied compulsions. The model proposes that the development of OCS during the perinatal period is because of a sudden and potentially overwhelming responsibility for the infant. The sudden increase in responsibility may in turn increase the risk of negative appraisals of infant-related intrusive thoughts, elevated anxiety, and subsequently overt and covert behaviors in response to the intrusive thoughts. The behaviors are often related to the child, such as avoiding the infant, checking the baby, or suppressing any intrusive thoughts related to the baby.

1.5 Psychological treatment of obsessions and unwanted intrusive thoughts

1.5.1 Cognitive behavioral therapy for OCD

The gold standard treatment for OCD is CBT, which includes exposure and response prevention (ERP), i.e., the patient expose him/herself to the obsessions, and resists engaging in compulsions. ERP for OCD has been shown to be highly efficacious, with 50-65% of patients responding to treatment [111,112].

Previous studies have indicated that taboo thoughts are associated with a higher degree of insight [113] and higher levels of treatment-seeking behaviors compared to other OCD symptom dimensions [114-116]. However, research also highlighted that treatment for patients with taboo obsessions are challenging, both for the patient and the therapist [117]. Patients with taboo obsessions delay or avoid seeking treatment due to shame or stigma associated with their thoughts [51], and they are generally more therapist-demanding [50]. Patients with taboo obsessions may also respond less well to standard psychological treatments, CBT/ERP [18,21-23,42,118] and to pharmacological treatments using selective serotonin reuptake inhibitors (SSRI) [119-121], although not all studies have found this association [122,123]. For example, one study examined the difference in treatment response to ERP in a sample of 132 OCD patients and found that there was no difference in treatment response among patients with unacceptable thoughts [122]. In a pediatric sample, no difference in treatment response was found between children who experienced sexual obsessions and children with other types of obsessions [47]. Studies that have focused specifically on sexual and religious obsessions among adults have indicated that these patients respond less well to CBT/ERP [21,23]. Additionally, one study investigating the long-term course of patients with OCD who were treated with a combination of SSRIs and behavioral therapy also identified sexual and religious obsessions as the foremost predictor of poorer treatment outcome [22].

Previous research investigating healthcare personnel's knowledge about and attitudes towards taboo obsessions have indicated that a majority have difficulties in correctly identifying taboo obsessions and are reluctant to engage in the recommended exposure-

based treatment with this patient group [124-126]. Therefore, there is a need for complementary forms of interventions, at least for patients who do not accept or respond to CBT/ERP.

1.5.2 Barriers for treatment seeking among parents suffering from unwanted intrusive thoughts

Previous research has shown that parents who experience UITs of infant-related harm are unwilling to disclose their thoughts to healthcare personnel, due to shame or stigma, or fears of being hospitalized against their will, being reported to child protection services, or their child being removed from their custody [51,98,127-130]. There are also reports showing high levels of stigma amongst the public toward mothers with a psychiatric diagnosis, indicating that mothers with OCD are perceived as less competent parents, less likable, and a possible risk to the baby. For example, as many as 60% of respondents in a survey study by Schofield, Brown, Siegel, Moss-Racusin [131] reported that they believed that it is necessary to contact social services if a mother has symptoms of OCD.

Challacombe, Wroe [129] argue that there is both a problem with a lack of treatment seeking behavior among parents who experience OCS, and a lack of awareness of OCD among healthcare professionals. This lack of awareness can lead to misdiagnosis and insufficient care, which in turn can lead to unnecessary distress. Speisman, Storch, Abramowitz [62] highlight the importance of parents receiving information to normalize UITs, and, if needed, referring the parent to further treatment. Qualitative data support this argument, showing that women do not receive sufficient information about mental health issues during pregnancy or after birth, and that healthcare personnel are unwilling or not qualified to discuss these issues [132]. This is despite the fact that mothers seem to be positive toward being asked about and receiving information about their mental health status [133].

1.5.3 Cognitive therapy targeting obsessions

Cognitive therapy (CT) for obsessions is based on the cognitive theory of obsessions (see section *Cognitive model of obsessions*). In short, the treatment rationale stipulates that a) obsessions will persist if the negative appraisal of the intrusive thoughts continues, and b) the obsessions will decrease if the appraisals weaken or disappear. The main aim of CT is therefore to change the individual's negative appraisals to more functional and realistic beliefs [4]. In contrast to ERP, CT does not include any explicit focus on exposure exercises or habituation. The treatment instead includes cognitive exercises such as behavioral experiments to help the individual test and re-evaluate their negative appraisals and formulate new, more functional and nuanced beliefs. This is in turn hypothesized to reduce the frequency and intrusiveness of the obsessions, which will also inhibit any excessive control or avoidance behaviors.

Despite a relatively small number of trials, CT for OCD is thought to have a similar effect as ERP, with treatment response rates of around 65%, defined as 7.0 to 14.3 points reduction on the Y-BOCS [112]. CT has been suggested to be a promising treatment alternative for UITs because the treatment addresses dysfunctional beliefs and negative appraisals [117,134]. Only

one RCT has evaluated Rachman's CT specifically targeting obsessions. The effect of CT was compared to waiting-list control and to an active control consisting of stress management training (SMT). Results showed that both CT and SMT was associated with significant effects on OCD symptoms reduction post-treatment, within-group *d* = 1.76 and *d* = 1.49, respectively. The reduction of symptoms in both treatment conditions were significantly greater compared to the waiting-list control [105]. Direct comparisons with ERP and CT are lacking, but one study has compared the effects of an adjusted ERP protocol without cognitive treatment components and a CBT protocol with a specific focus on cognitive treatment components in a sample of 83 patients with OCD. Based on the outcome of treatment completers (*n* = 59), results showed no difference in the effect on OCD-symptom severity between ERP and CBT post-treatment[135].

1.5.4 Need for more scalable cognitive interventions

The main role of the therapist in CT is to engage the patient in a Socratic dialogue and to jointly elaborate on more nuanced interpretations of intrusive thoughts. The therapist is traditionally regarded as very important in CT, and the number of sessions in the published trials on obsessions have ranged from 12 [105] to 24 [136]. This rather high degree of therapist input may hinder implementation of this type of treatment into regular healthcare.

Several studies have developed and tested internet-delivered ERP-based treatments for patients with OCD with overall positive results [137-140]. CT in an online format could not only enable scalability, but possibly also provide a treatment format for individuals who experience distressing taboo thoughts without fulfilling the diagnostic criteria for OCD. Studies have shown that individuals with subthreshold levels of OCD symptoms have comparable functional impairments and psychiatric comorbidity as patients with full-blown OCD [141,142]. A large proportion of parents of infants and toddlers who experience taboo obsessions related to their child do not fulfil the criteria for OCD [65,67,68], and access to evidence-based treatment is currently limited for these parents [143]. Encouragingly, two studies that investigated one short preventive cognitive intervention for postpartum OCS [144] and an intensive 12-hour CBT intervention over two weeks for post-partum OCD [145] both showed promising results. A next step to enable a more scalable intervention to reach this population could be to develop a self-guided internet-delivered intervention specifically targeting UITs. Internet-delivered, self-guided CBT for OCS in general (i.e., not specifically taboo obsessions) have previously been evaluated with promising results [146,147].

1.6 Summary

UITs including taboo themes is a commonly experienced cognitive phenomenon. However, the intrusive thoughts can become increasingly frequent and distressing, and elicit high levels of impairment. In their most extreme form, these thoughts can result in a diagnosis of OCD. Previous studies have indicated that OCD patients with taboo obsessions require a substantial amount of therapist support and may respond less well to standard psychological treatment. Individuals who suffer from sub-threshold symptoms have very limited or no access to treatment. CT has been shown to be effective in reducing frequency and distress from UITs.

However, CT is also a highly resource demanding form of treatment. One way to reach the larger population who struggle with UITs could be to develop and evaluate CT in an internet-delivered format.

2 Research aims

2.1 Overarching aims

The overall aim of this thesis was to develop and evaluate a novel online intervention approach for OCD patients with taboo obsessions and parents of infants and toddlers with distressing UITs of infant-related harm. Specifically, this thesis aimed to (1) evaluate feasibility, acceptability, and efficacy of a therapist-supported online cognitive intervention (I-CT) for OCD patients with taboo obsessions; (2) investigate frequency and impact of UITs, and attitudes toward psychological online interventions among the general population of parents of infants and toddlers in Sweden; (3) evaluate the initial efficacy, feasibility, and acceptability of a self-guided I-CT intervention for parents of infants and toddlers with UITs about harming their child; and (4) evaluate if changes in negative appraisals of the thoughts mediate the intervention effect on OCD symptom severity and UITs, as hypothesized by the cognitive model. Specific aims for each study are presented below.

2.2 Study I: Feasibility study for OCD patients with taboo obsessions

The aim of Study I was to conduct a preliminary feasibility and efficacy investigation of the therapist-supported I-CT intervention for OCD patients with taboo obsessions. Specific aims were to investigate (1) if participants were able to grasp and apply the cognitive theory of obsessions to their own situation; (2) if participants who received I-CT had a clinically meaningful reduction of OCD symptoms; and (3) if a reduction in OCD-symptom severity was mainly driven by reduced negative appraisals.

2.3 Study II: A randomized controlled study for OCD patients with taboo obsessions

The main aim of Study II was to evaluate if therapist-guided I-CT was more effective in reducing OCD symptoms among OCD patients with taboo obsessions than a control condition containing online general psychological support. A secondary aim was to investigate if the effect of the intervention was mediated by a reduction in negative appraisals.

2.4 Study III: Cross-sectional survey study for parents of infants and toddlers

The aims of this cross-sectional survey study were to investigate (1) the frequency and impact of UITs of infant-related harm among the general population of parents of infants and toddlers in Sweden; (2) the relationship between negative appraisals and UITs in this population; and (3) respondents' attitudes towards psychological online intervention targeting UITs.

2.5 Study IV: An initial randomized control study with mediation analysis

This study had two aims: (1) to evaluate the initial efficacy, feasibility, and acceptability of a self-guided I-CT intervention for parents of infants and toddlers with UITs about harming their child, and (2) to investigate if change in negative appraisals mediated the effect of the I-CT intervention.

2.6 Study V: A qualitative analysis study

The aim of this study was to conduct an in-depth investigation of parents' experiences of the self-guided I-CT intervention from Study IV. Results could inform possible adjustments and improvements of the I-CT intervention.

3 The empirical studies

3.1 The online cognitive intervention

The intervention evaluated in the current thesis is based on the intervention manual "The treatment of obsessions" [4]. According to the cognitive model of obsessions, the unwanted intrusive thoughts are maintained by negative or catastrophic interpretations. The focus of the cognitive intervention approaches is therefore to change negative appraisals of the thoughts to more realistic and functional beliefs. The intervention does not include any exposure exercises, but instead consists of common cognitive intervention components, such as cognitive restructuring and behavioral experiments.

The intervention is delivered in two online formats, a therapist-supported format for OCD patients with taboo obsessions and a self-guided format for parents with UITs of infant-related harm. The content of the intervention is essentially the same for both delivery formats, with small adjustments. For example, included case examples in the intervention material varied to better fit the two different populations. Table 1 below includes a condensed description of the content in the two versions of the cognitive online intervention (I-CT). A more detailed description of the intervention content can be found in Olofsdotter Lauri, Aspvall, Bagøien Hustad, Malmqvist, Serlachius, Mataix-Cols, Rück, Ivanov, Andersson [148].

Table 1. Overview of the online cognitive intervention targeting UITs

Therapist-guided treatment		Self-guided intervention	
Delivered online over 8 or 10 weeks. Participants had regular contact with a designated therapist via a messenger system on the intervention platform.		Delivered online over eight weeks. Participants worked independently with the material.	
Module	Module aim	Module	Module aim
1	Psychoeducation about the cognitive model of unwanted intrusive thoughts.	1	Psychoeducation about the cognitive model of unwanted intrusive thoughts.
2	Provide further understanding of the cognitive model and how to apply it to own situation.	2	Provide further understanding of the cognitive model and how to apply it to own situation.
3	Focus on cognitive restructuring to achieve a more nuanced interpretation of the unwanted thoughts.	3	Focus on cognitive restructuring to achieve a more nuanced interpretation of the unwanted thoughts.
4	Focus on the role of attention and why active engagement in intrusive thoughts can increase anxiety.	4	Focus on the role of attention and why active engagement in intrusive thoughts can increase anxiety.
5 & 6	Focus on behavioral experiments and how to test the evidence supporting the interpretation of the thoughts.	5	Focus on behavioral experiments and how to test the evidence supporting the interpretation of the thoughts. Focus on common difficulties when working with I-CT and suggestions on how to solve these.
7	Focus on common difficulties when working with I-CT and suggestions on how to solve these.	6	Make a strategy for how to continue the work with the I-CT intervention.
8	Make a strategy for how to continue the work with the I-CT intervention.		

I-CT, Online cognitive therapy

3.2 Study I

3.2.1 Methods

Study I was a feasibility study including 19 OCD patients with taboo obsessions, female = 14 (74%). Patients were recruited from an OCD clinic (*n* = 14) or via self-referral (*n* = 5). All participants received the I-CT intervention for 10 weeks. The I-CT intervention included a total of eight treatment modules administered via a secure digital treatment platform (Table 1). Feasibility was assessed by general quantitative process data, e.g., number of treatment dropouts, completed treatment modules, number of adverse advents, qualitative data investigating if participants had understood the cognitive framework and experiences collected from the therapists administering the I-CT intervention. Acceptability was assessed by an adapted version of the Patient Satisfaction Questionnaire. The primary outcome measure assessing efficacy was the clinical-rated Yale–Brown Obsessive–Compulsive Scale (Y-BOCS). The Y-BOCS was administered by a clinical psychologist pre- and post-intervention and at the 6-month follow-up. Secondary measures included self-rated questionnaires assessing change in negative appraisals of the taboo obsessions, OCD symptom severity, depression, functional impairments, cognitive biases related to intrusive thoughts, worry, and metacognitive beliefs.

3.2.2 Main results

The I-CT intervention was deemed feasible and acceptable by the participants. Sixty-three percent of the participants completed all eight treatment modules (M = 6.9, SD = 2.1) and 68% were able to understand and apply the cognitive framework to their own situation. The average number of sent messages in the treatment platform from the participant to the therapist was 43.0 (SD = 20.1). Adverse events were mainly assessed to be mild and transient. A large majority of the participants (74%) reported being satisfied or very satisfied with the intervention and that they would recommend the intervention to others. A large within-group effect size on OCD symptom severity was found post-intervention (*d* = 1.67 [95% CI; 0.67 to 2.66]), and the effect was sustained to the 6-month follow-up. Change in OCD-severity measured by the self-rated Y-BOCS are shown in Figure 1. At post-intervention, 63% of the participants were classified as treatment responders and 32% were classified as treatment remitters. A time-lagged analysis showed a unidirectional relationship where a reduction in OCD-symptom severity was preceded by a reduction in negative appraisals. There were significant improvements on all secondary outcome measures, except on depressive symptoms. Additionally, post-hoc analysis showed that the effect of treatment was driven mainly by the participants who were assessed to have understood and been able to apply the cognitive framework to their own situation.

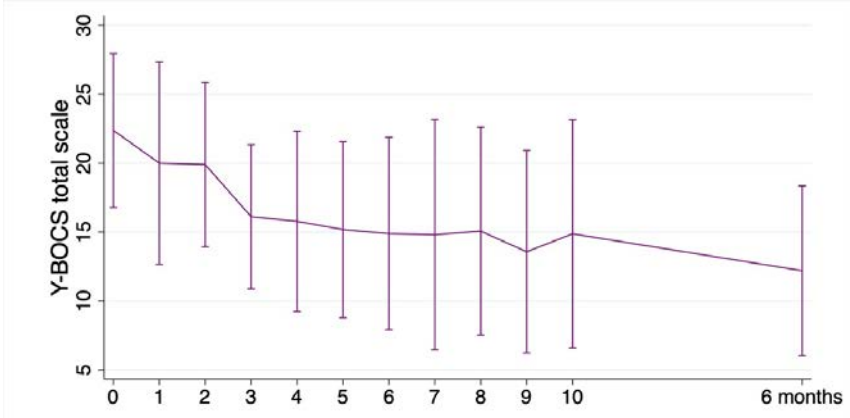

Figure 1. Change in OCD-severity measured by the self-rated Yale–Brown Obsessive–Compulsive Scale (Y-BOCS) with 95% confidence intervals. Scores are shown pre-treatment (week 0), weekly during the intervention (week 1–9), post-treatment (week 10) and at the 6-month follow-up.

3.3 Study II

3.3.1 Methods

Study II was a randomized controlled trial with a mediation analysis including 68 OCD patients with taboo obsessions (female = 42 [62%]). Recruitment was conducted via advertisements posted on the social media platforms, Facebook and Instagram, as well as in print media. Participants were randomized 1:1 to two groups: therapist-supported I-CT or the control condition. The participants in the intervention group received the I-CT intervention for eight weeks, while the participants in the control condition were given access to general psychological support online during the same amount of time. The primary outcome measure was the clinical-rated Y-BOCS assessing change in OCD-symptom severity from pre-intervention to post-intervention (primary endpoint). The post-intervention assessments were conducted by assessors blinded to treatment allocation. Secondary outcomes included self-rated measures assessing change in OCD-symptom severity, negative appraisals of the taboo obsessions, depressive symptoms, daily functioning, and worry. Additionally, clinical-rated assessments were conducted to measure level of change in psychopathology following the intervention.

3.3.2 Main results

Results from Study II showed that the participants, regardless of treatment allocation, had a significant reduction of OCD-symptom severity from pre-intervention to post-intervention measured by the clinical-rated Y-BOCS. The reduction of symptoms was significantly larger in the I-CT group compared to the control group, with a moderate effect size ($p = 0.003$, between-group bootstrapped $d = 0.69$ [95% CI; 0.20 – 1.19]); please see figure 2. The I-CT

group also had significant larger reductions pre- to post-intervention on self-rated OCD symptoms, negative appraisals, depressive symptoms, and a significant larger increase in daily functioning. The effect of treatment was mediated by change in negative appraisals (portion mediated was 55%). The average number of completed treatment modules in the I-CT group was 4.4 (SD = 2.4) and average number of messages sent by the participant to the therapist was 17.7 (SD=16.0).

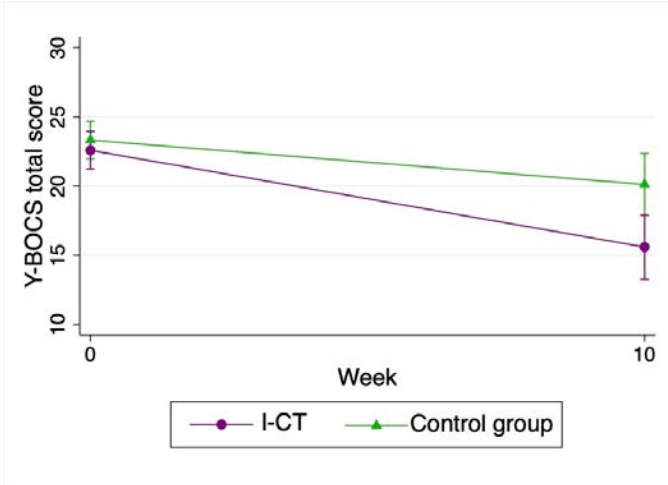

Figure 2. Change in OCD-severity measured by the primary outcome measure the clinical-rated Yale–Brown Obsessive–Compulsive Scale (Y-BOCS) with 95% confidence intervals. Scores are shown at pre-treatment (week 0) and post-treatment (week 10).

3.4 Study III

3.4.1 Methods

Study III was a cross-sectional survey study including 594 (female = 490 [82%]) parents of a minimum of one child aged 0-3 years. Participants were recruited via an advertisement posted on the social media platform Facebook. All participants completed an anonymous online survey, including questions about demographic characteristics, the questionnaire Parental Thoughts and Behaviors Checklist (PTBC) assessing UITs and related behaviors, and a condensed version of the Personal Significance Scale (PSS) assessing negative appraisals. Additionally, the survey included some further questions regarding the impact of the UITs and attitudes towards internet-based psychological interventions for UITs.

3.4.2 Main results

Results showed that 56% of the respondent were experiencing or had previously experienced UITs about intentionally harming their child. Of the respondents who reported experiencing UITs, 54% experienced that the UITs had a negative impact on their self-image, 18% reported

difficulties in controlling the UITs, 19% reported that the UITs had a negative impact on their relationship/attachment to their child, and 12% reported that the UITs had a negative impact on their relationship with their partner, parents, or friends. A moderate to strong correlation (r [320] = 0.54) was found between the severity of UITs and the degree of negative appraisals. Half of the respondents (51%) were positive towards internet-based psychological interventions targeting UITs (Figure 3).

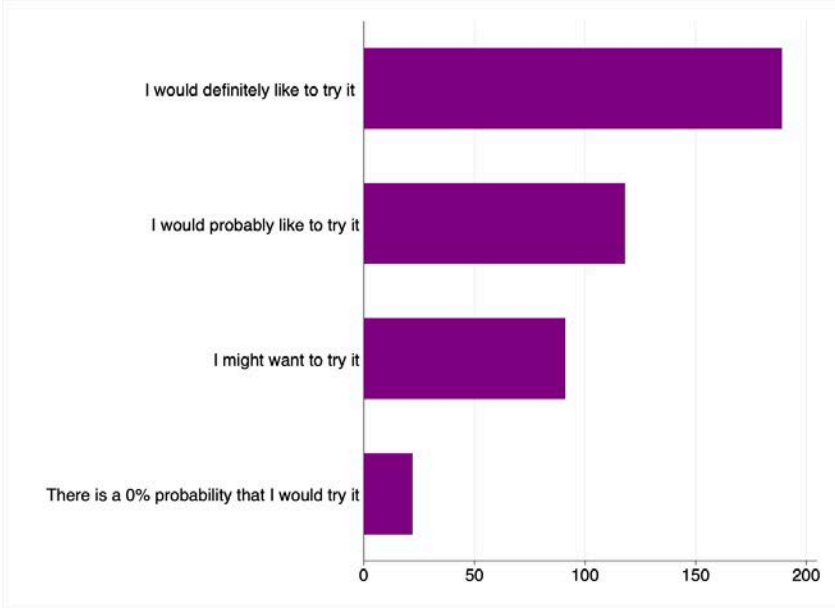

Figure 3. Distribution of participants responses to item: "If you wanted to get treatment for your unwanted thoughts, would you consider trying an internet-delivered psychological intervention?"

3.5 Study IV

3.5.1 Methods

Study IV was an initial RCT including 43 (female = 40 [93%]) parents of children aged 0-3 years who reported daily distressing UITs about intentionally harming their child. Participants were randomized 1:1 to either an eight-week self-guided I-CT intervention or waiting-list control. The treatment comprised six text-based modules (Table 1). The primary outcome measure was the self-rated PTBC, administered pre-intervention (week 0), weekly during the intervention (weeks 1–7), at week 8 (primary endpoint), and at one-month follow-up. Secondary outcome measures included self-rated questionnaires assessing change in negative appraisals of the taboo obsessions, depression, sleep difficulties, functional impairment, and parental function. Feasibility was assessed by the number of completed modules and number of dropouts, as well as by assessing the participants' understanding of

and ability to apply the cognitive framework to their own situation. Acceptability was assessed at week eight using an adapted version of the Client Satisfaction Questionnaire (CSQ).

3.5.2 Main results

The self-guided I-CT intervention was associated with a significantly larger reduction of UITs compared to waiting-list at post-intervention (between-group *d* = 0.99, 95% CI; 0.56 to 1.43). The effect was maintained to the one-month follow-up (Figure 3). Participants in the intervention group also showed a significantly larger reduction in depressive symptoms, sleep impairment, general well-being, and parental function compared to participants in the waiting-list group. A parallel mediation analysis showed that the effect of the intervention was mediated by reductions in negative appraisals. A sensitivity analysis indicated that the model was sensitive to assumptions about mediator-outcome confounding. Half of the participants (n=11) completed four to six modules, and four participants (18%) did not complete any modules at all. Of the total sample, 86% (n=37) completed post-intervention assessment and 81% (n=35) completed the one-month follow-up assessment. Eighteen participants (82%) in the intervention group completed the self-rated assessment post-intervention, and 100% of these participants deemed the intervention as acceptable.

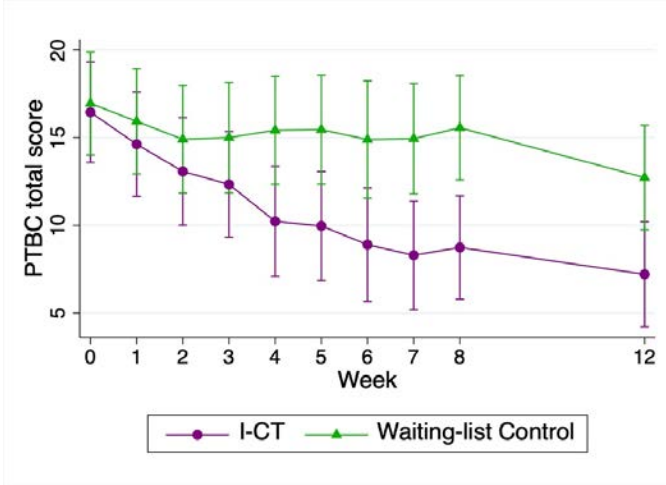

Figure 3. Change in levels of unwanted intrusive thoughts of infant-related harm in the intervention and the control condition measured by the primary outcome measure Parental Thoughts and Behavior Checklist (PTBC) with 95% confidence intervals. Scores are shown pre-treatment (week 0), weekly during the intervention (week 1–7), post-treatment (week 8) and at the one-month follow-up (week 12).

3.6 Study V

3.6.1 Methods

Study V was a qualitative interview study investigating parents' experiences of taking part in the self-guided I-CT. All participants in the intervention group from Study IV were invited to participate in a semi-structured interview one month after completion of the intervention. Eight participants, female = 7 (88%) accepted. All interviews were audio recorded and transcribed verbatim. The transcriptions were analyzed using thematic analysis, and the data were coded and categorized into main themes and sub-themes.

3.6.2 Main results

The thematic analysis revealed two main themes: (1) Changed perception of the unwanted intrusive thoughts, and (2) Different paths to recovery. The first main theme had three sub-themes, which showed that prior to the intervention the parents experienced shame related to the UITs, and that they had not revealed their thoughts to any healthcare personnel. The intervention had been effective in reducing UITs mainly because it normalized the thoughts and helped the parents to interpret their thoughts in new, more functional ways. This had several positive effects on the parents' general well-being and parental function. The second main theme had two sub-themes, which showed that the parents perceived different parts of the intervention content and format as helpful. The flexibility and anonymity of the self-guided online intervention were highlighted as positive. Some parents asked for additional therapist support and commented that the intervention platform should be better adapted to smartphones.

4 Ethical considerations

All studies included in this thesis were approved by the Swedish Ethical Review Authority.

During my work with developing an online intervention for individuals with taboo obsessions or UITs, several ethical issues have arisen. I would like to discuss three main ethical concerns surrounding the studies included in this thesis. These are: (1) concerns about the risk of normalizing UITs, (2) risk involved in including participants who do not experience UITs, and (3) monitoring adverse events. Firstly, I would like to comment on a concern raised by the Swedish Ethical Review Authority during the ethical approval application process for Study III. The concern was that if the UITs are normalized for the participant, there is a potential risk that the participants would act on their UITs. Thus, the Swedish Ethical Review Authority hypothesized that normalization would occur when individuals replied to the anonymous online survey and that this normalization in turn could lead to dangerous behaviors toward oneself or others. The same concern could probably also have been raised with taboo obsessions. This view of UITs and taboo obsessions is highly problematic since there is no scientific support for this notion. On the contrary, evidence-based psychological treatments for individuals with taboo obsessions aims to normalize the thoughts and help the person to interpret the thoughts as nothing threatening, personally significant, or dangerous. Similarly, in the current thesis, one aim was to normalize the taboo themed thoughts, both in the survey conducted as part of Study III and in the intervention evaluated in the other four studies. No previous research has reported that the normalization process or psychological treatment for obsessions increases the risk of violent behaviors [105,144]. The fact that the Swedish Ethical Review Authority raised this concern highlights the importance of increased knowledge about what UITs and taboo obsessions implies, that UITs and taboo obsessions are ego-dystonic, i.e., inconsistent with one's self-concept and beliefs, and that individuals who experience these thoughts do not exhibit violent behaviors to a greater extent than the general public.

Secondly, I would like to discuss the potential risk of wrongfully including participants who suffer from ego-syntonic thoughts or other mental issues in studies evaluating interventions for taboo obsessions and UITs. For example, individuals who do not suffer from obsessions but who instead have a genuine pedophile sexual orientation. We took several steps to limit the risk of this in the studies included in this thesis. In Studies I and II we conducted in-depth clinical assessments with all study applicants before inclusion in the study, limiting the risk of wrongful inclusions. The study procedure in Study IV did not include any clinician assessments during the inclusion procedure. However, the study webpage included detailed information about for whom the intervention was intended, and we called participants if there were any uncertainties about their symptom presentation. Additionally, I would argue that even if an incorrect inclusion had occurred, it would not have increased the risk for these individuals to act on their ego-syntonic thoughts. The I-CT intervention is focused on helping the individual to reflect and nuance their interpretations of intrusive thoughts. There are no exposure-based components in this intervention, thus participants were not asked to approach any feared stimuli or to put themselves in any risk situations. The possible gains of developing an easily

accessible intervention for patients with OCD and taboo obsessions and for parents who suffer from UITs therefore outweigh the possible risks.

Finally, as in all clinical research studies, it is important to monitor possible negative intervention effects and adverse events. Traditionally, this has not been a priority in clinical psychological research, but it is becoming more common to also evaluate possible negative effects following psychological interventions. In the current thesis we collected data on adverse events in Studies I, II and IV via self-rated questionnaires. In Study V, adverse events were investigated in the conducted in-depth interviews. All adverse events reported in the studies were assessed to be mainly mild and transient. In Studies I, II and IV, we also asked the participants to rate their symptom levels every week, and we contacted participants proactively if we noticed a decline in their online ratings. This procedure is beneficial for the included participants as they receive extensive support and care. This also enables important scientific data on risks and benefits of partaking in clinical studies evaluating psychological interventions.

5 Discussion

The overall aim of this thesis was to develop and evaluate the effect and the mechanism of change of a novel, online intervention approach targeting taboo obsessions and UITs of intentional harm. The five included studies are the first to evaluate I-CT targeting taboo obsessions among patients with OCD and among parents with UITs. The results provide initial evidence that the intervention can be effective in reducing potentially impairing symptoms in both these populations. I will discuss the results in relation to the specific aims of the current thesis below.

5.1 Acceptability and feasibility of I-CT targeting taboo obsessions and unwanted intrusive thoughts

Recruitment of participants in the included studies was, for the most part, effective and fast. A majority of the participants (74%) in Study I (the pilot study including OCD patients) were recruited via a specialist clinic for OCD. Our personal experience of recruiting via an OCD clinic was that the interest of an intervention targeting taboo obsessions was high, both among clinicians and patients. Recruitment in the other studies was conducted via advertisements on social media and in print press. This latter form of recruitment strategy has been shown to generate large numbers of applicants to each study, ensuring a speedy process. However, it has been difficult to recruit male participants in all studies. To reach male participants is a common difficulty when recruiting to clinical psychological studies, especially when recruiting via social media [149-151]. To increase the generalizability of the results from research studies, it is important to find new ways to recruit male participants. This may be especially relevant in future research regarding UITs among new parents. Fathers have mostly been overlooked in research studies investigating UITs in the postpartum period, even though they seem to experience comparable rates of UITs [67,85].

With regard to the feasibility of the therapist-guided version of the intervention, the results from the included studies varies. In the feasibility study, the participants completed on average 6.9 treatment modules. In the RCT, the corresponding number was 4.4. Additionally, the number of messages sent in the treatment platform from the participant to the therapist was considerably lower in Study II (M = 17.7) than in Study I (M = 43.0). Possible reasons for the lower completion rates and engagement in intervention could be the shorter duration of intervention (8 instead of 10 weeks) and that the samples differed on other variables due to the different recruitment strategies in the two studies.

Feasibility of the self-rated version of the intervention was evaluated in Study IV (the RCT study including parents). In this study, 37/43 (86%) participants completed the post-intervention assessments, and 35/43 (81%) completed the one-month follow-up assessments. This level of data attrition is relatively minor compared to previously conducted RCTs investigating self-guided digital treatments for OCD, where the assessment completion rates have been 68% and 78% post-treatment [146,147]. Treatment completion rates in Study IV was low, with only 32% completing all treatment modules. This is lower

than has been reported in previous studies investigating self-guided interventions for OCD, showing treatment completion rates of 40% in Wootton, Karin, Titov, Dear [146] and 52% in Wootton, McDonald, Melkonian, Karin, Titov, Dear [147]. Even though treatment completion in the present study was low, the intervention group had a large reduction of UITs. The qualitative analysis in Study V highlighted that several participants experienced an early effect and therefore did not feel motivated to complete the full intervention. This indicates that the current version of the self-guided I-CT intervention may be too extensive for some parents, and a shorter or more condensed version of the intervention could potentially be suitable for some parents.

The acceptability of the intervention was assessed in Studies I and IV. A majority (78%) of the participants included in the two studies reported being satisfied or very satisfied with the intervention. The qualitative analysis conducted in Study IV revealed mainly positive attitudes toward the intervention. Additionally, Study III investigating parents' attitudes toward internet-delivered interventions for UITs showed that half of the parents were positive towards receiving digital interventions.

5.2 Frequency and impact of UITs among parents of infants and toddlers

Study III investigated the frequency and impact of UITs in a sample of Swedish parents to children aged 0–3 years in a cross-sectional survey. Results were in line with previous research. For example, around half of the sample in Study III reported that they experienced UITs of intentional infant-related harm, as shown by Brok, Lok, Oosterbaan, Schene, Tendolkar, van Eijndhoven [69]. Also, as previously found in several studies [65-67], approximately 20% of the sample reported that the thoughts negatively affected their daily function or relationships. In line with findings from Goodman, Tyer-Viola [152] and Smith, Shao, Howell, Wang, Poschman, Yonkers [153], few parents in the survey-study reported seeking (9%) or receiving (5%) treatment for their UITs. Not previously investigated, Study III also showed that a majority of the participants were interested in receiving psychological interventions for UITs, and half of the sample were interested in internet-delivered psychological interventions for their thoughts.

5.3 Efficacy of the online cognitive intervention targeting taboo obsessions and unwanted intrusive thoughts

The results from the studies in this thesis provide initial evidence supporting the efficacy of I-CT targeting taboo obsessions among OCD patients and UITs among parents. Studies I and II evaluated the efficacy of the therapist-guided version of the intervention, showing large within-group effect sizes (d = 1.67 and d = 1.26 respectively), and a moderate between-group effect size compared to an active control (d = 0.69, Study II). The effect of the self-guided intervention was evaluated compared to a waiting-list control in Study IV. A large between-group effect size of d = 0.99 was found. Results are comparable with previous research evaluating therapist-guided digital CBT treatments for OCD (g = 1.14) [20] and self-guided digital CBT treatments for OCD (d = 1.05;) [146].

5.4 Evaluation of the mediation effect of change of negative appraisals

The hypothesized mechanism of change in the cognitive model of obsessions is that change in negative appraisals mediates a reduction of UITs [2,3]. The association between negative appraisals and UITs has been established in previous research [85,103,104]; however, the causality of the association is still unclear [104,106]. In the current thesis, results from a time-lagged analysis in Study I support the hypothesized mechanism of change, showing that a change in negative appraisals preceded a change in UITs. Mediation analyses in Studies II and VI also support this notion, indicating that change in negative appraisals mediates a change in UITs. However, these studies used a parallel mediation design and the causality of the mediation effect could therefore not be established. Additionally, none of the models in these studies were robust to mediator-outcome confounders, and results are therefore preliminary. Qualitative data from Study V investigating the self-guided I-CT for parents with UITs showed that the experience of the participants was that the intervention changed their negative appraisals of the thoughts, and this led to a reduction of UITs. Further research is needed to fully investigate the mediating effects of the digital cognitive intervention.

5.5 Limitations

There are several limitations important to keep in mind when interpreting the results from the studies induced in this thesis. The studies only included relatively small sample sizes (n = 8 – 68), with the exception of the cross-sectional survey study (n = 594), the participants were mainly recruited via social media (e.g., Facebook) and were, to a large majority, female. All this limits the generalization of the findings. Additionally, in the included studies, the participants were not masked to treatment allocation and the effects of the I-CT were not compared to any established treatment for OCD.

5.6 Future directions

There are several steps needed to fully evaluate if I-CT is a valid intervention option for patients with OCD and taboo obsessions, and for parents with UITs of infant-related harm. One suggestion for a future trial to investigate how to utilize I-CT for OCD patients with taboo obsessions could be to include participants who either do not respond to or do not want to engage in standard psychological treatment, e.g., CBT/ERP, and compare I-CT against an active control condition in this population. This approach of providing I-CT to non-responding patients as a second step intervention could potentially lead to improved long-term effects for this this large subgroup of OCD patients.

For parents who struggle with UITs, a possible future study could be a large-scale efficacy trial comparing I-CT with an active control group. This would not only answer the important question of whether or not I-CT is an effective intervention for parents with UITs, but would also provide insights into the mechanisms of change during this intervention. For example, this could allow for an investigation in the causality of the proposed mediator in I-CT, i.e., do

negative appraisals lead to subsequent change in UITs? Further, this large-scale efficacy trial could investigate if change in UITs leads to subsequent improvements in parental self-efficacy and if reductions in UITs and improved parental self-efficacy in turn have a protective effect against developing other mental health problems such as depression. Previous research has shown that lowered parental self-efficacy is a strong predictor of worse mental health outcomes [82], and it is therefore important to investigate if this process can be reversed for at least some individuals who struggle with UITs.

As mentioned above, previous research has shown that healthcare professionals are in need of training to appropriately assess and treat intrusive thoughts as both expected and treatable symptoms in new parents, to reduce the risk of misdiagnosis and insufficient care [129]. One suggestion for future steps could therefore be to develop digital and scalable training material for clinicians who meet new parents in their daily practice. The training program could be developed in collaboration with healthcare clinicians and stepwise be tested in different contexts and for different professionals. The long-term aim of this approach could be to investigate if the training material leads to improved daily clinical management skills of parents with UITs, and if this in turn has other positive effects for the parent, e.g., normalization of the thoughts, reduction of UITs, increased help-seeking behaviors, and faster time to receive adequate care.

6 Conclusions

The overall aim of this thesis was to develop and evaluate the effect and the mechanism of change of a novel online intervention approach for OCD patients with taboo obsessions and parents of infants and toddlers with distressing UITs of infant-related harm. Keeping the limitation of the included studies in mind, e.g., pilot design and small sample sizes, results from the included studies showed:

- The online cognitive intervention is a feasible and acceptable intervention, delivered both in a therapist-guided format for OCD patients with taboo obsessions and in a self-guided format for parents with UITs of infant-related harm.
- Initial evidence of the efficacy of the online cognitive intervention in reducing distressing and impairing UITs.
- The effect of intervention seems to be mediated by a change in negative appraisals, as stipulated by the cognitive model of obsessions.
- The online cognitive intervention can be a promising complementary intervention alternative to standard psychological interventions for patients with OCD and taboo obsessions, and as a possible easy access, scalable intervention for the large population of parents suffering from UITs.

7 Points of perspective

The current thesis is based on the notion that obsessions exist on a continuum from normally occurring UITs to obsessions, and that the UITs become excessively distressing and impairing if the individual appraises the UITs as personally significant or dangerous. This led to the development of the cognitive online intervention targeting UITs, for both the population of patients with OCD and individuals who suffer from UITs without necessarily fulfilling the criteria for an OCD diagnosis.

I will now discuss two questions. First, what are the benefits of viewing a psychiatric disorder or symptom, in this case OCD and obsessions, as a continuum from normal symptoms to illness? To view psychiatric diagnoses as part of a continuum has been associated with less public stigma towards mental illness and better mental health outcomes [154,155]. There is also research showing that stigma is a barrier toward seeking treatment [156]. This has specifically been shown among individuals who experience taboo obsessions and UITs of infant-related harm [51,98,127-130]. Additionally, stigma towards individuals with taboo obsessions or UITs seems to exist not only among the public, but among healthcare providers as well, possibly hindering intervention delivery [124-126]. Hence, it seems to be beneficial to adapt and communicate the continuum view of mental illness to the public to possibly reduce stigma and help individuals access treatment.

Second, should we develop interventions targeting both clinical and sub-clinical populations? One could argue that an intervention targeting sub-clinical populations could pathologize a normal cognitive phenomenon, e.g., UITs, and, by this, lead to unnecessary treatment, increased stigma, and societal costs. However, the proposed intervention in this study focuses on normalizing UITs, and thus reducing the thoughts and related distress and functional impairment. It has been shown that individuals who experience sub-clinical OCD can have similar levels of impairment as individuals with a diagnosis of OCD [142]. The proposed intervention is also delivered online, which both enables scalability and could possibly decrease the cost of delivery by reducing the therapist time compared to standard psychological treatments, which are traditionally provided face-to-face [140]. Finally, to deliver treatments to both clinical and sub-clinical individuals is in line with the view of psychiatric symptoms as existing in a continuum, which, as argued above, can reduce stigma.

Considering this, I believe that there is a need for treatments that can reach both individuals who suffer from OCD with taboo obsessions who cannot or will not engage in standard psychological treatments, and individuals who are not offered any psychological intervention because they do not fulfill the full criteria for a diagnosis but are still experiencing distress and lower functioning relating to UITs. Many individuals experiencing taboo obsessions and UITs could benefit from an easy-access intervention, and we have the technology in digital treatments to reach larger populations. This could possibly not only increase the access of evidence-based psychological treatments, helping patients and individuals suffering from UITs, but also spread the view of psychiatric illness as part of a continuum, and reduce stigma within society at large.

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