

# Treatment of Obsessive-Compulsive Disorder and the Importance of Assessing Clinical Effectiveness

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## Scientific Environment

The professional and academic environment involved the OCD team at Haukeland University Hospital, which is formally part of The Bergen Group for Treatment Research, Department of Clinical Psychology, Faculty of Psychology, University of Bergen



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## Acknowledgements

In the spring of 2012 I moved to Bergen to start as a PhD student at the OCD team at Haukeland University Hospital (Helse Bergen). This marked the beginning of an incredible journey.

During the preceding fall, in September 2011, Professor Gerd Kvale initiated to establish an OCD team in Helse Bergen. The Norwegian Health Authorities had decided that all health regions should establish OCD clinics during 2012, as a result of Associate Professor Bjarne Hansen's tireless work. With the early establishment of the OCD team in Helse Bergen in 2011, the team made a head start, which was made possible thanks to the foresight by Director of Division of Psychiatry in Helse Bergen, Hans Olav Instefjord, who supported and facilitated the establishment of the team.

Since this early beginning, the OCD team has expanded greatly. Our ambition has continuously been to further develop our services for those who need them the most. It is therefore gratifying to observe the emerging fruits of our labor. The present thesis describes the treatment and clinical effectiveness research conducted at the OCD team, and so far the work has been well-received. An especially gratifying recognition of our work was the recent award *Innovation of the Year in Psychological Science*, which was awarded to the team by The Norwegian Society for Psychological Science, for the development of the Concentrated Exposure Treatment (cET) format for OCD.

I am proud to be part of the professional environment at the OCD team in Helse Bergen; an environment which may best be characterized by its creative atmosphere that allows for continuous innovation and expansion. At the foundation of the team's work is the overarching principle we constantly pursue:

*Empirically Supported Treatment + Clinical Effectiveness + Research = True.*

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*The OCD team photographed at Slåtterøy Lighthouse*

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## Abstract

Obsessive-compulsive disorder (OCD) is a debilitating disorder with a typically chronic course without treatment. The current thesis addresses the following research questions: The first aim is to provide an updated review of evidence-based psychological treatment for adult OCD. A traditional meta-analytic approach is combined with a systematic evaluation of the *methodological quality* of the included studies in order to provide recommendations for enhanced methodological stringency and study moderators of treatment outcome. These topics are addressed in Paper I. While randomized controlled trials (RCTs) can be considered the “gold standard” for treatment research, it can be argued that when evaluating a new treatment format, a pilot study followed by an effectiveness study and then a replication study is a preferable approach. The OCD-team in Helse Bergen, which is an out-patient clinic part of the specialist health care, has developed a novel treatment format of exposure based cognitive behavioral therapy where individually tailored and therapist assisted exposure and response prevention is delivered in a group format during four consecutive days. The second research aim was thus to assess to which extent OCD patients accepted the novel format, and to investigate its clinical effectiveness. Specifically changes in OCD symptoms, as well as changes in secondary outcomes like depression and work impairment, were investigated. These questions are addressed in a pilot study (Paper II) and an effectiveness study (Paper III). The third aim was to investigate if the results were replicable, which is addressed in Paper IV.

**Methods:** Paper I includes all randomized controlled trials (RCTs) of cognitive behavioral treatment (CBT) for OCD. The term CBT was defined as treatment with CBT, cognitive therapy (CT) or exposure and response prevention (ERP). Included studies were published between 1993 and 2014 and used the interview-based Yale–Brown Obsessive-compulsive Scale as a primary outcome measure. The paper provides a systematic review and meta-analysis of the included studies, as well as an evaluation of methodological aspects by using the *Psychotherapy outcome study methodology rating form*. Active treatments were compared to active treatment,

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control, or waitlist conditions, and potential moderators were investigated with a subgroup analysis and meta-regression analyses.

Paper II is a pilot study examining six patients undergoing *Concentrated Exposure Treatment* (cET), focusing on patients' acceptance of treatment defined as proportion declining treatment, attrition and patients' satisfaction; as well as clinical changes in OCD symptoms and depressive symptoms. OCD symptoms are assessed with the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) and depressive symptoms with the Beck Depression Inventory (BDI). Acceptability is assessed with clinical interviews.

Paper III is a larger effectiveness study that further investigates patients' acceptance and the feasibility of cET. Treatment outcome on primary assessment of OCD symptoms is assessed with Y-BOCS and secondary assessment of depressive symptoms are assessed with BDI. Work impairment is assessed with clinical interview.

Paper IV provides a replication study of Paper III with the aim to investigate whether a new patient sample undergoing cET would have comparable results as those obtained in Paper III when treatment is delivered by mainly other therapists than the developers of cET. Mixed models analyses and Chi square tests are applied to compare results on Y-BOCS, patient acceptance and occupational functioning.

**Results:** In Paper I the overall effect sizes for comparisons with waiting list (1.31) and placebo conditions (1.33) were very large. Effect sizes for comparisons between individual and group treatment were small and non-significant. CBT was better than medication (0.55), and adding medication to CBT was not more effective than CBT with placebo (0.25). Of treatment moderators, proportion of women, higher age and concurrent SSRI medication were associated with lower effect sizes. Moderators related to larger effect sizes were higher initial symptom severity, using completer analyses as opposed to intent-to-treat-analyses, using passive control (waiting list) as

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opposed to active control conditions, and studies assessing therapist competence. Overall mean methodological score was 23.03 (SD 4.37) in the 37 studies.

The results from Paper II indicated high patient acceptance: None of the patients declined participation, no patients dropped out and the patients expressed a high degree of treatment satisfaction. All patients had marked reductions in symptoms of OCD and depression. Follow-up assessments revealed that the treatment results to a large extent were maintained three and six months after treatment.

In Paper III there was high treatment acceptability. Two patients (5.4%) declined the offer of treatment and one patient (3%) dropped out prematurely. Ninety percent of the patients reported a high degree of treatment satisfaction, indicating that cET is an acceptable format. The sample had significant reductions in obsessive-compulsive symptoms after treatment, with gains maintained at the three- and six-month follow-ups. By analyzing clinically significant changes, 77% of the patients were classified as recovered six months after treatment, which is promising as the majority had long OCD duration and most patients had unsuccessfully tried previous treatment.

The results in Paper IV showed that the patients had high treatment acceptance, as indicated by no patients declining treatment, no treatment dropout and high self-reported treatment satisfaction. Most patients had marked and significant reductions in symptoms of OCD, with long-term gains maintained at three and six months. By comparing the results with those obtained in Paper III, the most important finding was that equal treatment outcome was achieved by different therapists in a new sample of patients.

**Conclusions:** The present thesis shows that CBT is an effective treatment for OCD, however, the methodological quality of the RCTs is characterized by several limitations with considerable room for improvement. Suggestions of enhanced methodological stringency in future efficacy studies are offered. Furthermore, the thesis shows that a concentrated four-day treatment format is well accepted by the patients and that the approach yields promising results. Promising results were also

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obtained in terms of the replicability of the format, and it was concluded that Paper IV offered a successful replication of Paper III, also when treatment was delivered by mainly different therapists.

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### Abbreviations

BDI	Beck Depression Inventory
BT	Behavior Therapy
CBT	Cognitive Behavioral Therapy
cET	Concentrated Exposure Treatment
CSQ	Client Satisfaction Questionnaire
CT	Cognitive Therapy
DSM-5	Diagnostic and Statistical Manual of Mental Disorders (5th ed.)
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders (4th ed.)
ERP	Exposure and Response Prevention
ES	Effect Size
FIML	Full Information Maximum Likelihood
GAD	Generalized Anxiety Disorder
ICD-10	International Statistical Classification of Diseases and Related Health Problems (10th ed.)
ITT	Intent to Treat
M.I.N.I.	The Mini-International Neuropsychiatric Interview
OCD	Obsessive-compulsive Disorder
OST	One-Session Treatment
PD	Panic Disorder
PSTD	Post-Traumatic Stress Disorder
RCT	Randomized Controlled Trial
SCID-I	Structured Clinical Interview for DSM IV Axis I-Disorders
SCID-II	Structured Clinical Interview for DSM IV Axis II-Disorders
SP	Social Phobia
SPSS	Statistical Package for the Social Sciences
SRI	Serotonin Reuptake Inhibitor
TAU	Treatment as Usual
WHO	World Health Organization



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WLC	Waitlist Control
Y-BOCS	Yale–Brown Obsessive-compulsive Scale

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# 1. Introduction

## 1.1 What is OCD?

Obsessive-compulsive disorder (OCD), as defined in the *Diagnostic and Statistical Manual of Mental Disorders 4th edition* (DSM-IV; American Psychiatric Association, 1994), is characterized by recurrent obsessions or compulsions that are time consuming and cause marked distress or impairment (Table 1)<sup>1</sup>. Obsessions are recurrent and persistent thoughts, urges, or images that are experienced as intrusive and unwanted. The affected individual tries to ignore or suppress these thoughts, urges or images, or tries to neutralize them by performing a compulsion. Typical obsessions are fear of contamination, thoughts about excessive responsibility (like fear of causing fire), or inappropriate thoughts with sexual or aggressive content. Obsessions are experienced as ego-dystonic, which means that they are inconsistent with the person's beliefs, attitudes and desires. Compulsions are physical or mental actions that are performed in response to obsessions in order to prevent a feared catastrophic outcome or to reduce anxiety and discomfort. In order to be diagnosed with OCD, the patient must, at some point, experience the obsessions as excessive or unwanted. OCD causes significant functional impairment, as well as difficulties with social and family functioning. Without treatment, the disorder typically has a chronic course (American Psychiatric Association, 1994). The World Health Organization has ranked OCD as one of the ten most debilitating disorders in terms of lost income and impaired quality of life (Murray & Lopez, 1996).

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<sup>1</sup> In the present thesis, the DSM-IV criteria for OCD are applied, as the DSM-5 (American Psychiatric Association, 2013) was not yet published at the time during which the project presented in this thesis was initiated.

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Table 1. Diagnostic criteria for obsessive-compulsive disorder (American Psychiatric Association, 1994)

***A. Either obsessions or compulsions:***

***Obsessions as defined by (1), (2), (3), and (4):***

- (1) recurrent and persistent thoughts, impulses, or images that are experienced, at some time during the disturbance, as intrusive and inappropriate and that cause marked anxiety or distress
- (2) the thoughts, impulses, or images are not simply excessive worries about real-life problems
- (3) the person attempts to ignore or suppress such thoughts, impulses, or images, or to neutralize them with some other thought or action
- (4) the person recognizes that the obsessional thoughts, impulses, or images are a product of his or her own mind (not imposed from without as in thought insertion)

***Compulsions as defined by (1) and (2):***

- (1) repetitive behaviors (e.g., hand washing, ordering, checking) or mental acts (e.g., praying, counting, repeating words silently) that the person feels driven to perform in response to an obsession, or according to rules that must be applied rigidly
- (2) the behaviors or mental acts are aimed at preventing or reducing distress or preventing some dreaded event or situation; however, these behaviors or mental acts either are not connected in a realistic way with what they are designed to neutralize or prevent or are clearly excessive

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- A. At some point during the course of the disorder, the person has recognized that the obsessions or compulsions are excessive or unreasonable. **Note:** This does not apply to children.
- B. The obsessions or compulsions cause marked distress, are time consuming (take more than 1 hour a day), or significantly interfere with the person's normal routine, occupational (or academic) functioning, or usual social activities or relationships.
- C. If another Axis I disorder is present, the content of the obsessions or compulsions is not restricted to it (e.g., preoccupation with food in the presence of an Eating Disorders; hair pulling in the presence of Trichotillomania; concern with appearance in the presence of Body Dysmorphic Disorder; preoccupation with drugs in the presence of a Substance Use Disorder; preoccupation with having a serious illness in the presence of Hypochondriasis; preoccupation with sexual urges or fantasies in the presence of a Paraphilia; or guilty ruminations in the presence of Major Depressive Disorder).
- E. The disturbance is not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition.

## 1.2 Prevalence

OCD was once believed to be a rare condition, with early estimates reporting that only 0.05% of the population was affected (Woodruff & Pitts, 1964). Although it is now recognized that OCD is more common than noted in these early reports, the prevalence estimates varies considerably between studies. One proposed cause is that many epidemiological studies used lay interviewers who may not be

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sufficiently skilled to, on the one hand, recognize OCD, and, on the other, differentiate OCD from other anxiety disorders, for example, differentiating obsessions from worry or rumination (Stein, Forde, Anderson, & Walker, 1997). Estimates based on clinically recognized OCD indicate a prevalence rate of less than 1% (Fireman, Koran, Leventhal, & Jacobson, 2001), whereas a Norwegian study applying DSM-III-R criteria for OCD reported a lifetime prevalence of 1.6% in the capital city, with a lower rate of 0.6% in rural areas, following the administration of diagnostic interviews using 1,080 subjects drawn from a random sample of 107,738 Norwegian residents (Kringlen, Torgersen, & Cramer, 2006). A higher prevalence rate was reported in an early epidemiological study, which found a 12-month prevalence of 1–2% and a lifetime prevalence of 2–3% (Karno, Golding, Sorenson, & Burnam, 1988), which were very similar to recent prevalence rates estimated by the National Institute of Mental Health (NIMH). Based on a nationally representative survey of U.S. adults, a lifetime prevalence rate of 2.3% and a 12-month prevalence rate of 1.2% were reported using clinician-administered interviews (Kessler, Berglund, et al., 2005; Kessler, Chiu, Demler, & Walters, 2005; Ruscio, Stein, Chiu, & Kessler, 2010). In summary, recent studies seem to indicate that OCD is more prevalent than previously believed and a more correct estimate of prevalence may be that 1% of the population has OCD at any point in time, with a lifetime prevalence of about 2%.

### **1.3 Onset**

The typical age of onset for OCD is somewhat unclear as studies of the pediatric and the adult patient populations have reported different findings. Whereas studies of children with OCD report a peak age of onset of about ten years (Flament et al., 1988; Geller, Biederman, Jones, Shapiro, et al., 1998), adult studies show that only between 30–50% of adults with OCD report that the disorder developed in childhood (Pauls, Alsobrook, Goodman, Rasmussen, & Leckman, 1995; Rasmussen & Eisen, 1990). These results may suggest that for some pediatric patients, obsessive-compulsive symptoms will decrease in severity over time. For adults, a mean age of

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onset of 20–21 years was reported and based on this observation, it was suggested that early and late age of onset be distinguished as distinct subtypes of OCD (Anholt et al., 2014; Karno et al., 1988).

OCD appears to affect both female and male patients with equal frequency in adult samples (Karno et al., 1988). For juvenile samples of OCD patients, a higher prevalence in males has been reported (Geller, Biederman, Jones, Park, et al., 1998; Hanna, 1995). In addition, there are data to suggest gender related clinical differences in children with OCD, with studies showing more incidences of early-onset in males (Mathis et al., 2011; Ruscio et al., 2010). It has been suggested that early-onset may be a distinct subtype of OCD characterized by higher symptom severity and higher prevalence of OCD in family members, as well as a higher prevalence of comorbid OCD-spectrum disorders, although not necessarily related to treatment outcome (Taylor, 2011). A recent study (Torp et al., 2015) investigating 20 potential treatment predictors in a large sample of 269 pediatric participants in The Nordic Long-term OCD Treatment Study (NordLOTS; Thomsen et al., 2013), found only age to be a predictor of treatment outcome, with younger children improving more compared to older children. Symptoms of OCD typically increase and decrease over time, often in response to stress (Mataix-Cols, Marks, Greist, Kobak, & Baer, 2002). Without treatment, OCD appears chronic, at least in the short term. However, some reports also indicate that in the longer term OCD may have a fluctuation course, with remission or at least symptom reduction over time (Marcks, Weisberg, Dyck, & Keller, 2011; Skoog & Skoog, 1999).

There is no consensus regarding subtypes of OCD, but based on factor analytical procedures to the content of typical obsessions, four subtypes have been suggested: “Contamination”, “responsibility”, “unacceptable thoughts” and “symmetry”. The typical compulsions for these obsessions are washing, checking, neutralizing thoughts and ordering (Abramowitz et al., 2010). In the DSM-IV, hoarding was listed as a criterion for OCD, but this classification was controversial, with researchers arguing that the clinical features of hoarding differed from other

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subtypes of OCD (Mataix-Cols et al., 2010). As a consequence, hoarding disorder was established as a separate disorder in the DSM-5, and included in a new category called obsessive-compulsive and related disorders (American Psychiatric Association, 2013).

The experience of thoughts with comparable content as typical obsessions is a rather normal phenomenon in the general population. A study showed that 90% of responders reported intrusive thoughts with close resemblance to the those reported by obsessional patients (Rachman & de Silva, 1978). Salkovskis and Harrison (1984) later carried out a replication study with comparable results.

#### **1.4 Comorbidity**

Comorbid conditions are frequently reported in patients with OCD, and Ruscio et al. (2010), using data from 2073 respondents diagnosed with lifetime OCD from the National Comorbidity Survey Replication, reported a comorbidity rate of 90%. The most common comorbid psychiatric conditions were anxiety disorders (75.8%) and mood disorders (63.3%). Clinical studies have reported that 50% had at least one additional comorbid disorder (Eddy, Dutra, Bradley, & Westen, 2004). Studies have also been conducted to investigate the incidence of comorbid Axis II disorders in patients with OCD; nevertheless, due to the large variability in the reported prevalence, the exact Axis II comorbidity rate is unclear. Crino and Andrews (1996b) assessed 258 patients with anxiety disorder, 80 of whom were diagnosed with OCD, and by applying the clinician administered Personality Disorder Examination (Loranger, 1988), the prevalence rate for personality disorders was found to be 9%. However, this is a much lower incidence rate than that reported in other studies. Vogel, Stiles, and Götestam (2004) reported that 66% of a sample 35 treatment seeking OCD patients had at least one comorbid personality disorder, according to the administration of the Structured Clinical Interview for DSM-III-R Personality Disorders (SCID-II; Spitzer, Williams, Gibbon, & First, 1990). Black, Noyes, Pfohl, Goldstein, and Blum (1993), also applying SCID-II (Spitzer et al., 1990), reported a

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prevalence rate of 87% Axis II disorders in a sample of 32 OCD patients. Despite these differences in reported prevalence rates of comorbid disorders in samples of OCD patients, it appears safe to conclude that a majority of patients with OCD experience comorbid conditions and that comorbidity in general seems to be the rule rather than the exception. Moreover, comorbidity appears to be a major factor in poorer quality of life in OCD patients, as this has been found to be largely influenced by comorbid depression (Huppert, Simpson, Nissenson, Liebowitz, & Foa, 2009). With the additional findings that OCD patients in general have impaired occupational functioning (Mancebo et al., 2008) it is clear that untreated, this group of patients experience a high degree of suffering.

## **1.5 A Brief Overview of Treatment for OCD**

### *1.5.1 The emergence of Exposure and response prevention*

Until the mid-1960s, OCD was considered a treatment-resistant disorder (Franklin & Foa, 2007). Prior to this, the main therapeutic effort was psychodynamic therapy, although this approach was not empirically supported (Abramowitz, 2006). The 1950s and 1960s marked progress in the field of treatment of anxiety in general with the development of behavior therapy. For example, Wolpe (1968) developed systematic desensitization, which proved effective for patients with anxiety, especially for the (then-called) simple phobias. The treatment approach involved a stepwise and systematic confrontation with fear-inducing stimuli following a pre-defined hierarchy and conducted while the patient was in a relaxed state. Although the method represented major progress in the treatment of anxiety, patients with OCD did not improve using this approach (Foa, 2010).

Meyer (1966) was the first to describe successful treatment of OCD. Meyer developed the treatment method later named exposure and response prevention (ERP). In what can be termed as a pilot case study, he demonstrated how patients who had not benefited from extensive previous therapy were helped by a new method that involved



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confronting anxiety provoking situations without engaging in anxiety reducing behavior. The treatment was conducted while patients were hospitalized and involved daily two-hour exposure sessions while patients were simultaneously encouraged not to engage in ritualistic behavior. In the initial description of the treatment, Meyer (1966) presented two cases of patients who were hospitalized for 12 weeks and nine weeks, respectively. One patient had a fear of contamination and excessive hand washing as primary OCD symptoms and during treatment, the patient was exposed to various objects and situations. In order to prevent compulsions from being performed, Meyer (1966) described that “Persuasion, reassurance and encouragement were used” (p. 277); in addition, water taps in the patient’s room were turned off. The paper also describes that after the residential treatment, patients were given outpatient follow-up sessions lasting over one year for the first patient and almost two years for the second. In a later effectiveness study, Meyer et al. (1974) found that of 15 patients receiving treatment, ten had significant improvement that was maintained five years after treatment for the majority of patients, pointing to promising long term treatment gains using ERP. Although Meyer first demonstrated the effectiveness of ERP in a residential unit, he also later showed that the treatment could be successfully conducted in the patient’s home environment (Meyer, Robertson, & Tatlow, 1975), which was an early demonstration of the potential for dissemination inherent in the treatment principles.

Interestingly, Meyer et al. (1974) results showing two thirds of patients improving considerably, are basically comparable to the reported treatment outcome across many later treatment studies of ERP. In addition, Fisher and Wells (2005) review showed that statistically reliable improvement was obtained by 75% of patients treated with ERP. Obviously, this also opens the doors for a gloomier interpretation, as these findings imply that treatment of OCD has not improved much since ERP was first developed. It may also be remarked that Meyer’s initial pilot study (Meyer, 1966) and the later effectiveness study (Meyer et al., 1974) represent a stepwise research progress in which a novel treatment approach was first described in a case study with

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descriptions both of the treatment content and the patients' response to the treatment. A larger effectiveness trial followed this. When these two initial studies were shown to have an effect, this laid the foundation for later randomized controlled studies.

In the 1970s, ERP was further evaluated and included in controlled studies (e.g. Boersma, Den Hengst, Dekker, & Emmelkamp, 1976; Emmelkamp & Kraanen, 1977; Foa & Goldstein, 1978). By the end of the decade, the evidence base strongly favored ERP as an effective treatment for OCD. Dismantling research was conducted in an attempt to identify which components of the treatment were responsible for the treatment effect. For example Foa and colleagues (Foa, Steketee, Grayson, Turner, & Latimer, 1984; Foa, Steketee, & Milby, 1980) examined separately the effect of exposure alone, response prevention alone, and the combination, with combined treatment showing superior effects over each of the individual components alone.

Later studies demonstrated that ERP was transportable to clinical outpatient settings as a treatment format with 15 daily two-hour sessions delivered over three weeks (Foa et al., 1984; Foa et al., 1980). The optimal frequency of sessions was also investigated and Emmelkamp, van den Heuvel, Rüphan, and Sanderman (1989) found no difference between short and long intervals between treatment sessions. In a later study, Abramowitz, Foa, and Franklin (2003) compared intensive ERP and twice-weekly ERP. The results showed that a protocol of eight weeks duration with twice-weekly sessions was as effective as intensive treatment with daily sessions for three weeks. These outpatient treatment studies were important as they demonstrated that ERP could be disseminated from the initial inpatient treatment studies to regular outpatient clinics.

### *1.5.2 Cognitive behavioral therapy*

Despite initial optimism due to the promising treatment effects of ERP, in the years following it was consistently established that a substantial proportion of patients receiving the treatment do not improve (Fisher & Wells, 2005). After cognitive therapy (CT) was demonstrated to be effective for anxiety disorders in the 1980s, ERP

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and CT were combined in the treatment of OCD in order to investigate if treatment effects were enhanced. The combination of CT and ERP has typically been termed cognitive behavioral therapy (CBT).

A relevant question is if and to what extent combined therapy gives enhanced effect compared to the individual treatment alone. With respect to answering whether treatment is improved by combining the two treatment approaches, the empirical findings are mixed (Abramowitz, Taylor, & McKay, 2005). For instance, in a group treatment study of OCD where McLean et al. (2001) compared ERP and CBT, the results showed that at post-treatment and at the three-month follow-up, the ERP condition was associated with marginally higher levels of symptom reduction, whereas for a clinically significant change, more patients in the ERP condition were recovered at the three-month follow-up.

Yet other studies have demonstrated equal results of ERP and CBT. Vogel et al. (2004) study compared the combination of ERP and CT to ERP and a psychological placebo, finding that adding cognitive therapy to ERP did not improve the ERP treatment, although patients who received additional cognitive therapy were significantly less likely to drop out. Whittal, Thordarson, and McLean (2005) randomized patients to 12 weeks of CBT or 12 weeks of ERP and the results showed that the groups did not differ significantly in terms of clinically significant change, although there were somewhat more recovered patients in the CBT condition, relative to the patients receiving ERP.

## **1.6 Treatment Formats of OCD**

Since Meyer (1966) first demonstrated that OCD can be treated with ERP, there has been an interesting development in the way treatment is delivered. The initial treatment results were based on inpatient treatment, whereas outpatient treatment now is most commonly delivered (NICE, 2006). CBT/ERP has been demonstrated as a robust approach that can be delivered in many different formats. These formats can be

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categorized according to a diversity of characteristics, e.g. whether the treatment is delivered individually, in a group or family; yet other characteristics may be related to treatment duration, frequency of sessions and number of sessions. Below is a brief presentation of some different treatment formats of OCD.

### *1.6.1 Individual treatment*

While CBT has been delivered in different formats, individual treatment is the most common format of treatment delivery, for example Rosa-Alcázar, Sánchez-Meca, Gómez-Conesa, and Marín-Martínez (2008) found 14 study comparisons with individual treatment compared to six study comparisons with group CBT. Studies have investigated different frequencies of treatment delivery, for example daily sessions over three weeks (Franklin, Abramowitz, Kozak, Levitt, & Foa, 2000) and twice-weekly sessions over eight weeks (Abramowitz et al., 2003). Duration of sessions also vary between studies, with some studies applying sessions of 45 minutes (e.g. van Balkom et al., 1998), while others have applied longer sessions lasting two hours (e.g. Vogel et al., 2004). In the NICE (2006) clinical guideline it is recommended that patients with OCD initially are offered brief treatment courses of up to 10 hours, which may be extended if treatment response is not seen after 10 hours. It is however a challenge to summarize the different approaches as there is a striking lack of replications of the different variations. Many studies have investigated different variants of ERP, varying both in terms of duration, frequency and length of sessions. Although the guidelines have direct suggestions for number of hours needed in the treatment of OCD, it is unclear how much therapy is sufficient. For example as indicated by Rosa-Alcázar et al. (2008) who found that treatment duration in weeks, number of hours per week and total number of hours were unrelated to treatment outcome. However, a methodological aspect which was not addressed by Rosa-Alcázar et al. (2008) is if the amount of therapy hours differed between treatment and control, which may also be a relevant aspect to investigate.

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### *1.6.2 Group treatment*

Group treatment for OCD is suggested as a cost-effective approach to the treatment of OCD. Jónsson and Hougaard (2009) systematically reviewed and meta-analyzed 13 group treatment studies for OCD. Effect sizes from group therapy and individual therapy did not differ significantly, but the meta-analysis included only one study that directly compared group to individual treatment formats. The authors, therefore, cautioned that there was insufficient data to draw conclusions on the relative effectiveness of group treatment and individual treatment. A literature search reveals that there are at least five RCTs using clinician administered Y-BOCS to compare individual and group treatment, of which only one (Anderson & Rees, 2007) was included in Jónsson and Hougaard (2009) meta-analysis. Thus, the relative effect of group and individual therapy should be investigated in future studies and meta-analyses.

### *1.6.3 Family treatment*

Given that family members often become involved in a patient's ritualistic behavior (Lebowitz, Panza, Su, & Bloch, 2012), family based treatments have been developed that specifically aim at targeting dysfunctional family accommodations. Emmelkamp, de Haan, and Hoogduin (1990) study showed equal results between conditions with and without family involvement. This study was conducted one year after the Y-BOCS was published and therefore did not use this measure that later became the "gold standard" for assessment of OCD symptoms (Frost, Steketee, Krause, & Trepanier, 1995). This makes it difficult to compare this study to later studies in terms of treatment outcome. Franklin and Foa (2007) summarized the results as only presenting modest symptom reduction, suggesting that the lack of therapist-assisted exposure and only twice-weekly home assignments of self-exposure might explain these limited treatment gains.

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Grunes, Neziroglu, and McKay (2001) described a family treatment approach with an eight-week family intervention group and compared results with patients who received individual treatment. The results showed that the family intervention group had a 26% symptom reduction, which was larger than were the results of the individual treatment group. It should be noted that the patients treated individually had only a 9% reduction in Y-BOCS assessed symptom severity. This is markedly lower than was the percentage of symptom reduction typically reported in individual treatment studies (Farris, McLean, Van Meter, Simpson, & Foa, 2013; Franklin et al., 2000). Also, at follow-up, the family group had a mean Y-BOCS score greater than 19, which is higher than the >16 Y-BOCS score often used as inclusion criteria in treatment studies (Farris et al., 2013).

In a recent meta-analysis of 29 studies of family involvement in the treatment of OCD, it was found that “family-inclusive treatment” yielded an overall large effect size of 1.68 (Thompson-Hollands, Edson, Tompson, & Comer, 2014). However, only nine of the studies were randomized controlled trials, and of these, four had waitlist or placebo as the control condition. With only five RCTs, the relative effect of family involvement compared to other treatment variants is yet to be established. Thus more well-controlled studies on the potential augmenting effect of adding family involvement in the treatment of OCD are warranted.

#### *1.6.4 Remote treatment*

Recently, there have been advances in the application of electronic solutions in the remote treatment of OCD. Among several remote modes of treatment, Internet and teleconference treatment approaches have been developed. Several studies have evaluated Internet delivered treatment (Andersson et al., 2012; Wootton, Dear, Johnston, Terides, & Titov, 2013). Wootton et al. (2013) randomized 56 patients to bibliotherapy, Internet CBT or waiting list groups. There were no significant differences between the bibliotherapy group and the Internet CBT group. That the bibliotherapy group had large symptom reduction is an interesting and unexpected

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finding. Also, studies using teleconference-based treatment have showed promising results. In a pilot study, Vogel et al. (2014) randomized patients to videoconference treatment, bibliotherapy and waiting list, and found that six of ten patients receiving treatment via videoconference were classified as recovered, using the Jacobson and Truax (1991) criteria for clinically significant change. It is worth noting that the patients in the bibliotherapy group, who were provided with a self-help book, had no treatment gains, in contrast with Wootton et al. (2013) treatment outcomes.

Wootton (in press) recently reviewed the literature on various remote treatments. The meta-analysis showed that remote treatment is associated with large effect sizes. However, there were several methodological limitations in the included studies and consequently the conclusions must be considered preliminary. Some studies did not conduct an assessment of diagnosis using structured interviews, which threatens the reliability of the OCD diagnosis. Both randomized and uncontrolled studies were analyzed together, and of the controlled studies waitlist controls were frequently applied, which is unfortunate given that uncontrolled studies may yield larger effect sizes than controlled studies, and wait-list control may give larger effect sizes than active control comparison. In addition both pediatric and adult samples were analyzed together. The empirical status for remote treatment is thus still unclear.

#### *1.6.5 Inpatient treatment*

The NICE (2006) guidelines suggested inpatient treatment with specific OCD expertise as the highest level of care that should be offered to a small proportion of patients who have not responded to previous pharmacological or psychological treatment trials over long periods of time. An important issue, thus, is the evidence base for inpatient treatment as an option for treatment refractory patients.

A recent meta-analysis investigated the empirical status of inpatient, day patient and residential unit OCD treatment for adults (Veale et al., 2016). Nineteen studies were identified, of which three were randomized controlled trials. Mean length

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of stay was 10.4 weeks, ranging from five weeks to 19.3 weeks. Between admission and discharge, the mean decrease in Y-BOCS score was 10.7 points, which equaled an overall effect size of 1.87. Length of stay was unrelated to treatment outcome.

Unfortunately, the studies reviewed by Veale et al. (2016) were characterized by methodological limitations. For example, not all studies conducted an assessment of diagnosis with structured clinical interviews, assessment of the adequacy of previous pharmacological and psychological treatment trials was not systematically reported, and few studies included follow-up assessment in order to evaluate the long term treatment outcome after the patients were discharged. Due to these methodological considerations of the studies analyzed by Veale et al. (2016) there is need for more research with increased methodological quality on inpatient treatment in order to establish if this is the right level of treatment for patients with high symptom severity and previous unsuccessful treatment attempts.

#### *1.6.6 Summary*

A range of different formats has been evaluated in the treatment of OCD. Even though a substantial number of controlled studies have been conducted, the lack of replication studies is maybe one of the most striking aspects of the treatment literature. Replication studies are a fundamental component for science to progress (Jasny, Chin, Chong, & Vignieri, 2011), still, replication studies are rarely conducted in the clinical psychological literature (Makel, Plucker, & Hegarty, 2012). Moreover, a recent study showed that of 100 psychology studies that were aimed to be replicated, only 36% of the original findings were replicated with statistically significant results. And in those cases where the original results were replicated, the replication studies had lower effect sizes than the original study (Open Science Collaboration, 2015). That replication studies are conducted so rarely is surprising, given that an important reason for the methods section in journals is to allow for the study to be replicated.



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## 1.7 Meta-analyses on Treatment of OCD – Why the Need for Another?

CBT has extensive empirical support in the treatment of OCD, as evident from a number of systematic reviews and meta-analyses investigating both efficacy and effectiveness (Abramowitz, 1996, 1997, 1998; Abramowitz, Franklin, & Foa, 2002; Eddy et al., 2004; Kobak, Greist, Jefferson, Katzelnick, & Henk, 1998; Olatunji, Davis, Powers, & Smits, 2013; Rosa-Alcázar et al., 2008; van Balkom et al., 1994).

Despite the relatively large number of previous meta-analyses on treatment of OCD it can be argued that there are several reasons that warrant an updated meta-analysis. Firstly, the most recent meta-analysis on CBT for OCD was conducted by Olatunji et al. (2013). As the main aim of that meta-analysis was to examine the efficacy of CBT in studies comparing CBT to placebo or passive control conditions, only 16 studies published between 1993 and 2010 were included; of these, three were pediatric studies and 13 were adult studies. Due to the strict inclusion and exclusion criteria, 21 relevant studies comparing active treatments were excluded. This meta-analysis is thus characterized by a low number of adult treatment studies analyzed.

Secondly; prior to Olatunji et al. (2013), Rosa-Alcázar et al. (2008) conducted a meta-analysis of psychological treatment of OCD. Since this meta-analysis more than 20 RCTs have been published. Thus, a large number of treatment studies have yet to be meta-analytically reviewed, which warrants an updated meta-analysis on the treatment literature.

A third reason for an updated meta-analysis is related to methodological issues. As mentioned previously, many treatment studies of OCD are characterized by limitations with respect to the methodological quality. This issue should be investigated systematically, which has not been performed in previous meta-analyses (see Table 2 and below).

Fourthly; of the previous meta-analyses published, the outcome measured in the included studies varied. This is due to several reasons, the most obvious being that

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many different outcome measures for OCD have been developed. Since it was presented, the Y-BOCS has reached wide application and an extensive number of studies have used this scale to assess OCD severity. A meta-analysis including only studies using this scale will have advantages, like avoiding having to standardize scores across different measures, which may bias the results. A related issue concerns assessment of treatment response. Many previous meta-analyses only calculated effect sizes as the overall measure of treatment outcome and only two studies reported proportion of remitted patients (see Table 2). Effect sizes can be criticized for not reflecting clinically significant change, as opposed to e.g. the criteria proposed by Jacobson and Truax (1991). An updated meta-analysis in which response rates are calculated based on one outcome scale should thus be preferred.

A fifth argument in favor of an updated meta-analysis on OCD concerns the notion that CBT is a challenging treatment. This has been suggested to explain an often-cited attrition and refusal rate of 25-30 % (Franklin & Foa, 1998). These rates should be critically analyzed across studies in order to establish if they are generally representable for CBT of OCD. Lastly, as mentioned briefly above, treatment of OCD has been developed across multiple formats. To what extent the mode of treatment is related to treatment outcome should be analyzed meta-analytically, given the large number of studies published since the last updated meta-analysis of OCD.

## **1.8 Recent Meta-analyses on OCD**

The two most recent meta-analyses on psychological treatment of OCD were conducted by Olatunji et al. (2013) and Rosa-Alcázar et al. (2008). Of the 16 included studies in Olatunji et al. (2013), five studies were published after the meta-analysis by Rosa-Alcázar et al. (2008). The inclusion of only studies with passive control conditions in Olatunji et al. (2013) should be noted, as it is well established that OCD has a chronic course over the short term (Marcks et al., 2011), consequently, patients in passive control conditions are not expected to improve as there is no evidence to suggest that symptoms decrease over shorter periods of time. Comparisons between

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CBT and waitlist controls will thus be expected to yield large and significant differences between the groups in favor of the active condition. Comparisons with waiting list controls and placebos may yield inflated effect sizes, evident from research consistently showing larger effect sizes for comparisons between treatment and passive control compared to studies showing differences between treatment and active control conditions (Baskin, Tierney, Minami, & Wampold, 2003; Furukawa et al., 2014; Sundell & Ferrer-Wreder, 2014). To avoid biased large effect sizes, active control conditions should be preferred.

A finding worth noting in Olatunji et al. (2013) is that five of the six studies that utilized placebos used psychological placebos (e.g. anxiety management or relaxation) and the results showed that effect size for CBT vs. placebo was smaller compared to CBT vs. waiting list. However, although psychological placebo is not an effective treatment for OCD, there was some change in patients in this group, implying that any therapist's attention may lead to some limited symptom reduction. Also, it is possible that psychological placebos (e.g. anxiety management) may incorporate some psychoeducation, which may encourage the patient to confront anxiety-evoking situations and reduce safety behaviors. Thus, the contents of psychological placebos should be controlled in treatment studies and be evaluated in meta-analytic reviews in order to avoid potential confounding therapy elements in the control condition.

Rosa-Alcázar et al. (2008) included studies with placebos or waiting list controls, in addition to studies with active control conditions. The inclusion of 19 adult studies published between 1980 and 2006 makes this the most recent and largest meta-analysis up until now of the adult treatment literature on OCD. The inclusion period ended in 2006, which means that studies published within the last nine years of the present date have yet to be reviewed using meta-analytic procedures. There is, therefore, a need for an updated meta-analysis covering the time period following the inclusion period in the meta-analysis by Rosa-Alcázar et al. (2008).

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Previous meta-analyses have aimed at investigating if ERP can be augmented by adding cognitive therapy. Rosa-Alcázar et al. (2008) meta-analysis reported very similar effect sizes of ERP alone ( $d = 1.127$ ), CT alone ( $d = 1.090$ ) and ERP with CT ( $d = 0.998$ ). Cohen (1992) has defined effect sizes of 0.20–0.49 as small, 0.50–0.79 as medium, and  $\geq 0.80$  as large, and accordingly, all the reported effect sizes were very large. Although these reported effects are not statistically different, it is an interesting finding that the mean effect of the combined ERP and CT treatment was somewhat lower compared to ERP and CT alone. The authors urge caution when interpreting these results due to variation in the number of studies in each type of treatment (13 groups with ERP, eight groups combining ERP and CT and only three groups of CT alone); however, if treatment is not enhanced by adding additional therapy elements to ERP, this means that there is no need for including additional cognitive interventions. Still, the large proportions of treatment participants who do not improve from ERP represent an important group of patients for which it is of uttermost importance to develop improved treatment strategies. This area should be further investigated both in treatment studies and using meta-analytic procedures.

Comorbidity is common in OCD patients. To what extent, if any, comorbid conditions influence the outcome of treatment for OCD has been meta-analytically investigated. Olatunji et al. (2013) analyzed moderators of treatment outcome for OCD and found no significant relationship between percentage of comorbid disorders and effect size. Pre-treatment levels of depression were also unrelated to treatment outcome. The authors concluded that the results were consistent with a previous meta-analysis that found that overall comorbidity did not influence the treatment outcome of CBT for anxiety disorders. Olatunji et al. (2013) analysis is limited due to the low number of included studies, as only 16 efficacy trials were analyzed, and three of these were pediatric studies. The authors, therefore, stated that more research on predictors of treatment outcome are needed. The findings from this meta-analysis contradicted Rosa-Alcázar et al. (2008) previous and larger meta-analysis using dichotomous variables for comorbidity (presence vs. absence of high comorbidity) to investigate

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comorbidity as a treatment predictor. The initial results showed a significantly higher effect size for studies with high comorbidity. However, when the study with the highest attrition rate (Vogel et al., 2004) was removed from the analysis, as the authors suggested that patients with high comorbidity may be more likely to drop out of treatment prematurely, the difference was no longer statistically significant. In summary, although one may suspect that OCD patients with comorbidity would profit less from CBT, this hypothesis is not supported by the results from the most updated meta-analyses. In the treatment of anxiety disorders (panic disorder, agoraphobia and PTSD), a positive effect of comorbidity on treatment outcome was found (Olatunji, Cisler, & Tolin, 2010). This issue should receive more empirical investigation, as concluded in Olatunji et al. (2013) recent meta-analysis.

### **1.9 Methodological Quality in Previous Meta-analyses**

Even though there have been numerous evaluations of treatment efficacy and the effectiveness of OCD treatment studies, the methodological quality of the treatment literature has not received the same amount of focus in the systematic reviews. The previous relevant meta-analyses that investigated the effect of psychological treatment for OCD (Abramowitz, 1996, 1998; Abramowitz et al., 2002; Olatunji et al., 2013; Rosa-Alcázar et al., 2008) and four meta-analyses that evaluated both pharmacological and psychological treatments (Abramowitz, 1997; Eddy et al., 2004; Kobak et al., 1998; van Balkom et al., 1994) did not include a systematic methodological evaluation of the reviewed studies. Specifically, the following methodological aspects were not systematically assessed (from Öst, 2008): statistical power, reliably diagnosing participants, reliability of primary outcome measures, number of therapists, adherence and competence, credibility rating, control of drug treatment, assessment of response and remission, independence and blindness of raters, and rating of methodological quality (Table 2).

Of the nine previous meta-analyses reviewed, only four provided some form of overall rating of methodological quality (Kobak et al., 1998; Olatunji et al., 2013;

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Rosa-Alcázar et al., 2008; van Balkom et al., 1994). Two meta-analyses (Eddy et al., 2004; Rosa-Alcázar et al., 2008) evaluated whether or not participants were diagnosed according to standardized clinical interview. These two meta-analyses and van Balkom et al. (1994) study were alone in assessing control of concomitant drug treatment. Olatunji et al. (2013) and van Balkom et al. (1994) assessed adherence to the treatment manual. Olatunji et al. (2013) and Eddy et al. (2004) evaluated blindness of raters. Three analyses (Olatunji et al., 2013; Rosa-Alcázar et al., 2008; van Balkom et al., 1994) rated risk of bias; however, two of these only applied the fail-safe N, which is not regarded as sensitive enough for the detection of publication bias, as pointed out in Paper I. Reliability of the outcome measure was ensured in six of the nine meta-analyses, although the primary outcome measure varied between the studies.

All meta-analyses compared the included studies according to the primary outcome, as would be expected in a meta-analysis. By standardizing treatment outcome in terms of effect size, the treatment effects across studies and measurement can be compared. However, to standardize treatment outcome and calculate effect sizes represent a methodological issue. Although effect size indices are based on standardized mean differences, there are several ways of defining what differences to use. There may be differences in the way treatment studies have calculated effect sizes due to various research designs, and these differences must be taken into consideration when aggregating effect sizes across studies when a meta-analysis is conducted (Morris & DeShon, 2002). The between-group effect size can be

Table 2. Review of previous meta-analyses on OCD

	Olatunji (2013)	Rosa-Alcizar (2008)	Eddy (2004)	Abramowitz (2002)	Kobak (1998)	Abramowitz (1998)	Abramowitz (1997)	Abramowitz (1996)	van Balkom (1994)
Background data	+	+	+	+	+	+	+	+	+
Treatment data	+	+	+	+	+	+	+	+	+
<u>Review of methodological issues</u>									
Statistical power	-	-	-	-	-	-	-	-	-
Reliably diagnosing patients	-	+	+	-	-	-	-	-	-
Reliability of primary outcome measure	-	+	+	+	-	+	+	+	-
Number of therapists in the study	-	-	-	-	-	-	-	-	-
Adherence and competence ratings	+	-	-	-	-	-	-	-	+
Credibility ratings	-	-	-	-	-	-	-	-	-
Control of drug treatment	-	+	+	-	-	-	-	-	+
Assessment of response and remission	-	-	+	-	+	+	-	-	-
Independence and blindness of raters	+	-	+	-	-	-	-	-	-
Rating of methodological quality	+	+	-	-	+	-	-	-	+
Rating risk of bias	+	+	-	-	-	-	-	-	+
<u>Outcome data</u>									
Primary measure	+	+	+	+	+	+	+	+	+
Response	-	-	+	-	+	+	-	-	-
Remission	-	-	+	-	-	+	-	-	-
Within-group effect size	+	+	+	-	+	-	-	+	+
Comparison of type of CBT	+	+	+	+	+	+	+	+	+

Note: All items are rated on dichotomous variables (presence or absence). (2) *Review of methodological issues* is based on whether the issue was addressed in the meta-analysis. (3) *Rating of methodological quality scores* was indicated if a specific methodological rating scale was applied.

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calculated as  $(M_{\text{active treatment}} - M_{\text{comparison}}) / SD_{\text{pooled}}$ , based on the difference between the treated group and the control group in the post-test (Abramowitz, 1997; Abramowitz et al., 2002). The within-group effect size is the difference between the pre- and post-treatment measurements and can be calculated as  $(M_{\text{pre}} - M_{\text{post}}) / SD_{\text{pre}}$  (Abramowitz, 1996; Eddy et al., 2004; Olatunji et al., 2013; Rosa-Alcázar et al., 2008; van Balkom et al., 1994). It is a well-established statistical finding that within-group effect sizes tend to be larger than are between-groups effect sizes (Lakens, 2013), thus it is perhaps problematic that one meta-analysis calculated effect sizes by combining the pre–post change and between-groups comparison (Kobak et al., 1998). In any case, it is preferable that meta-analyses provide both between-groups and within-groups effect sizes as these different indices of effect size are not directly comparable (Morris & DeShon, 2002). Unfortunately, this can be hard to achieve; for instance, Eddy et al. (2004) were able to retrieve sufficient data only from three studies for calculation of the pooled between-group effect size across the psychological treatments, compared to 13 studies for the pre–post effect size. Obviously, this is problematic, as similar to in this meta-analysis, the pre–post effect sizes were larger than were those from comparisons between treatment and control.

Treatment response was addressed in three of the meta-analyses and only two addressed proportion of remitted patients. Treatment response is a central aspect when evaluating treatment outcome, however, the way of defining treatment response varies between studies, generally in CBT treatment for anxiety disorders (Loerinc et al., 2015). Although effect sizes demonstrate the statistically significant change after treatment, Jacobson and Truax (1991) argued that this is not informative with respect to clinically significant change. To assess clinical improvement, they suggested that criteria for change should reflect whether a patient had reliable symptom reduction (reliable change index; RCI) and is in the non-dysfunctional range after treatment. Patients can then be classified as recovered, improved, unchanged and deteriorated accordingly. To be recovered, a patient must have a) a symptom change that exceeds the measurement error (RCI) from pre- to post-treatment and b) be in the non-clinical



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population after treatment. Fisher and Wells (2005) recommended a cut-off score on the Y-BOCS of 14 based on review studies.

van Balkom et al. (1994), in an early meta-analysis of behavior, cognitive and pharmacological therapies, evaluated certain quality variables. For behavior therapy studies, the quality variables *duration of treatment*, *therapist contact*, *treatment integrity*, and *control of concomitant drug treatment* were assessed. One of the quality variables, *duration of treatment*, was related to treatment outcome, with longer treatment duration being associated with higher effect size. Even so, it may be debated if duration of treatment really represents an aspect of methodological quality, as this variable could be coded as a treatment characteristic.

Kobak et al. (1998) meta-analysis of pharmacological and behavioral treatment of OCD examined the relationship between methodological variables and effect sizes. Five methodological characteristics of the included studies were coded: effect size method (between subjects change scores vs. between subjects endpoint scores vs. within-subjects pre–post treatment), control group (presence vs. absence), random assignment (random vs. non-random) publication form (refereed journal vs. other source), and type of outcome measure (observer rated vs. self-rated vs. pooled). The analysis showed that the effect size for ERP was significantly larger compared to with serotonin reuptake inhibitors (SRI), but this effect was no longer significant when the methodological variables were controlled for, indicating a relationship between methodological quality and treatment outcome. These results must be treated with caution. As evident from the methodological aspects that were evaluated, this meta-analysis also included non-randomized studies, studies published in non-peer-reviewed journals and pediatric treatment studies. In such heterogeneous samples that include non-randomized samples with less methodological stringency, the implications and generalizability of the results will be somewhat unclear.

In a large meta-analysis covering both pharmacological and psychological treatment of OCD, Eddy et al. (2004) discussed methodological aspects of the included

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treatments, for example, the application of ITT statistics, reporting of proportions of improved and recovered patients, and reporting of comorbidity based on a diagnostic screening. The methodological quality was only assessed in a descriptive manner and the relationship between methodological aspects and treatment outcome was not tested. Based on the review of the methodological aspects and inherent weaknesses of the included studies, Eddy et al. (2004) suggested some welcomed advice for improved methodological quality in treatment research. Especially relevant for the present thesis were the methodological suggestions that resemble items from Öst's (2008) scale, for instance reporting comorbidity, conducting ITT analyses and reporting proportions of improved and recovered patients.

In Rosa-Alcázar et al. (2008) more recent meta-analysis, the authors also investigated if methodological characteristics moderated treatment outcome. The methodological characteristics studied were type of design, type of control group, control of concomitant treatment, attrition, and the  $d$  index in the pretest. These aspects were all coded as dichotomous variables. In addition, the overall methodological quality was rated on a zero-to-five scale. The application of dichotomous variables and the small range of the overall zero-to-five methodological quality scale give a restricted range of scores, which makes it difficult to analyze the relationship with effect size. The only detected relationship between methodological aspects and outcome in Rosa-Alcázar et al. (2008) study was attrition, with the results showing that attrition in the control group was related to effect size, i.e. the higher the attrition the larger the effect size. When the study with the highest attrition rate (Vogel et al., 2014) was removed from the analysis, this relationship was no longer statistically significant.

If the comparison between two treatments yields non-significant differences, one cannot conclude that the treatments are equally effective. For this conclusion to be drawn, a non-inferiority design or an equivalence test is necessary (Walker & Nowacki, 2011). A sufficient sample size is required for a superiority design and the APA Division 12 Work Force (Chambless et al., 1998; Steketee, Chambless, & Tran,

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2001) recommended a cell size of at least 30. Unfortunately, in treatment research on OCD, few studies have a large enough sample size and consequently, most studies are too underpowered to conduct a test of superiority. This is illustrated in Rosa-Alcázar et al. (2008) meta-analysis that included 19 studies with 24 comparisons between treatment and control conditions. The mean cell size in the included studies was 18 subjects, and only four of the studies had conditions with cells equal to or exceeding 30 subjects, which means that the majority of studies were too underpowered to draw conclusions concerning superiority. Nevertheless, such conclusions are often drawn anyway, which is a problem that is rarely addressed, both in general treatment studies and in meta-analyses.

Olatunji et al. (2013) meta-analysis evaluated two methodological aspects on a dichotomous scale (presence or absence): if studies applied treatment integrity checks and if studies used blind assessors. The moderator analysis showed that these methodological characteristics were unrelated to effect sizes.

With regard to the unknown methodological quality in OCD treatment research and the possible effect on treatment outcome, it is good that three meta-analyses explicitly aimed at investigating methodological quality as a moderator of treatment results (Kobak et al., 1998; Olatunji et al., 2013; Rosa-Alcázar et al., 2008). However, they share some limitations. The most important is that none applied a specified measurement scale for evaluating methodological quality. Thus it is difficult to compare the rating of methodological aspects provided in each meta-analysis. This is partly explained by the fact that there is no widely established rating form for methodological quality, and of the scales that do exist (e.g. the criteria proposed by Jadad et al., 1996), many are limited to dichotomous scores (presence vs. absence) with a small range for total score (e.g. a maximum of five points on the Jadad et al., 1996 scale). This causes difficulties when studying the possible relationship between methodological characteristics and effect size (Öst, 2008).

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To overcome these limitations, Öst (2008) developed a rating scale for the evaluation of the methodological quality in randomized controlled treatment studies. The scale has 22 items assessing various aspects of methodological quality, which are rated on a zero-to-two scale (0=poor, 1=fair, and 2=good), with a theoretical total range of 0–44. The wide scoring range allows for increased variability and thus may be more applicable when evaluating treatment quality and comparing its relationship with treatment outcome. Öst (2008) first applied the scale in a systematic review and meta-analysis of the efficacy of what has been named the third wave of behavioral therapies (Hayes, 2004). The evaluation showed that the methodological quality of the third wave studies was inferior to CBT studies.

Öst (2014) updated the meta-analysis due to the large number of studies on acceptance and commitment therapy (ACT) published since the first meta-analysis. A relationship between methodological quality and effect size was found, i.e. the lower the methodological quality the higher the effect size. This was an interesting finding, suggesting that studies with poorer methodological stringency may actually show better treatment effect, which again implies that poorer methodological quality may inflate effect sizes. It is obviously of importance to investigate if such a relationship is also true for RCTs on the treatment of OCD. As evident from the review of the previous meta-analyses described above, the methodological quality in OCD research is not well understood and it is not known if methodological aspects influence treatment outcome. However, such a relationship is not implausible since methodological quality concerns aspects like the degree to which the therapist adhered to the manual and with what competence – variables that could be hypothesized to have an impact on the treatment outcome. Öst (2014) also investigated if there had been progress in methodological quality during the seven-year period after the first meta-analysis by evaluating if the research field had implemented the recommendations for improved methodological stringency provided in the original meta-analysis. Interestingly, Öst (2014) found discouraging results in the follow-up

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meta-analysis, with the results showing that the methodological quality had not improved during the time succeeding the original meta-analysis.

A review of the methodological quality of RCTs on the treatment of OCD has not previously been conducted to the same extent as for the third wave of behavioral therapies (Öst, 2008) and for ACT (Öst, 2014). A limitation of the methodological assessment employed in previous meta-analyses on OCD was that a standardized assessment scale was not used, which makes it hard to compare the methodological quality in OCD research with related disciplines.

In order to overcome this limitation, the first aim of the present thesis will be to apply the *Psychotherapy outcome study methodology rating form* (Öst, 2008) to assess the methodological quality in RCTs for OCD, as well as providing a traditional systematic review and meta-analysis of the treatment literature. Potential moderators for treatment outcome will also be assessed.

### **1.10 Concentrated Exposure Treatment (cET) in a Group Format**

As referred to above there is a vast empirical body supporting CBT as an efficacious treatment for OCD. The core element of such treatment is exposure and response prevention (ERP) in which patients systematically approach triggers associated with anxiety and distress, without performing rituals or other reassurance seeking behaviors. Such treatment has successfully been delivered in a number of different formats like individual or group treatment and with treatment sessions delivered on a weekly basis or concentrated, with comparable amount of treatment delivered in a shorter timespan (e.g. Whiteside et al., 2014). In the current thesis the feasibility and effectiveness of a novel, concentrated format where therapist assisted exposure was delivered during four concentrated days has been explored. For a detailed description procedures and treatment, see Methods.

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### 1.11 Assessment of Clinical Effectiveness

Assessment of clinical effectiveness can be integrated as part of the treatment course. In order to assess clinical effectiveness in routine clinics, the implementation of systematic assessment of all patient courses is a feasible way of collecting data on treatment processes and outcomes. The idea of systematic assessment in the routine clinic is not new. More than 20 years ago, Kazdin (1994) made the case for systematic evaluation of clinical practice with the primary argument being enhanced healthcare for patients and improving the basis for the inferences drawn about treatment change. In this paper and in later work, (Kazdin, 2006) outlined recommendations for the methodological aspects that would need to be addressed, like assessment of diagnosis, feasible study designs, and data evaluation strategies.

There have been some studies on data from routine practices that are based on the implementation of systematic feedback and assessment of consecutive patient courses. Westbrook and Kirk (2005) published a study of patients receiving treatment in a public healthcare clinic in the UK. In this clinic, which provides CBT treatment, routine outcome data were collected over several years, allowing for analysis of a large sample of 1276 patients with various psychological disorders, 75 of whom were diagnosed with OCD. The study showed that although treatment was less effective than what was obtained in efficacy studies, still about half of the sample improved and one third recovered.

Leon, Davis, and Kraemer (2011) recommended that when assessing the clinical effectiveness of treatment at a routine clinic, a small scale pilot study should be the initial step. A pilot study is a small scale test of the methods and procedures that are later to be implemented on a larger scale (Porta, 2008). As pointed out by Leon et al. (2011), the purpose of a pilot study is not to test hypotheses or to provide effect sizes that are meaningful to interpret; rather, the pilot study can be conducted to test feasibility and explore patients' acceptance of the treatment, the latter being important when evaluating novel treatment approaches. This is of obvious importance for attrition; if the patients do not tolerate a treatment, this will potentially have adverse

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consequences for attrition. More importantly, low patient satisfaction would represent a possible threat to two of the cornerstones of the working alliance, as defined by (Bordin, 1979) – shared goals and agreement on the treatment method.

When the feasibility of the study has been investigated and the patients' acceptance and satisfaction with the treatment has been evaluated, an effectiveness study can then be carried out (Leon et al., 2011). There is no agreed upon definition of what constitutes an effectiveness study (Gartlehner, Hansen, Nissman, Lohr, & Carey, 2006), and degree of clinical representativeness has been proposed as one way of operationalizing effectiveness studies to be separated from efficacy studies (Shadish, Navarro, Matt, & Phillips, 2000; Stewart & Chambless, 2009), with suggested criteria being, for example, treatment carried out in a non-university setting by professional therapists with a flexible structure (Hans & Hiller, 2013). Hoagwood, Hibbs, Brent, and Jensen (1995), in a paper discussing future directions for treatment research in child and pediatric mental health, presented a dimensional model where treatment was first studied in an open community setting before it was more carefully scrutinized in a laboratory or controlled setting. This way, an effectiveness trial was conducted before a randomized controlled trial, compared to the more common practice of first carrying out an efficacy trial and then testing the treatment in a clinical effectiveness study. The authors argued that carrying out research in this order leads to the ecological validity of the treatment being investigated first, before technical aspects and processes of the treatment are studied in a controlled setting. Hoagwood et al. (1995) described a linear model of scientific progress in which findings from efficacy studies were implemented in real world healthcare settings and thereafter, the clinical effectiveness can be evaluated. However, this issue may be approached from the other way around. If a treatment is neither demonstrated effective in an initial pilot study, nor in a succeeding effectiveness study, there may be no reason for the conductance of an RCT.

In order to obtain increased methodological quality in effectiveness studies on OCD (and anxiety disorders in general), Hans and Hiller (2013), in a meta-analysis of non-randomized studies of CBT for anxiety disorders, presented concrete suggestions.

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First, they recommended the use of structured diagnostic interviews in order to obtain a reliable diagnosis of the patient. Second, they recommended using symptom measures with known and established psychometric properties. Third, they outlined the importance of reporting attrition in order to avoid biased estimates of effect sizes from completer data, as it is well-known that ITT analyses usually have lower effect sizes. In order to succeed in implementing these specific recommendations for improved quality in effectiveness studies, the authors suggested the implementation of systematic assessment and evaluation of patients in routine clinics, applying the abovementioned criteria for increased methodological stringency.

A pilot study is also a good feasibility test before an RCT is carried out. This can be conducted in a pilot-randomized study (Feeley et al., 2009), as exemplified by Vogel et al. (2014) in the treatment of OCD. The randomized controlled trial is the most stringent test of a cause–effect relationship between an intervention and the treatment outcome (Green, 2006; Kendall, 2003). However, for studies of clinical effectiveness in the routine clinic, this treatment design may not be the most informative. Patients waiting to enter treatment could, for example, be randomized to a waiting list, but for the treatment of OCD, there is not much to gain from this type of control and thus, such a design would be less relevant. Following an effectiveness study, a replication study could instead be a viable research option.

Makel et al. (2012) remarked that replication studies rarely occur in psychology research. From reviewing the 100 psychology journals with the highest impact factor, they concluded that the replication rate for psychology research was only 1 %. Although Makel et al. (2012) included psychology research in general and not clinical psychology studies particularly, the findings are also of relevance for research on psychological treatment. As commented by Lilienfeld and Pinto (2015), this figure may actually be overly optimistic with respect to research on psychopathology, for example due to the difficulty of recruiting patients to clinical psychology research. Makel et al. (2012) found that more than half of the replication studies were conducted by the same research team as the original study. This is interesting with respect to the



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APA Division 12 Task Force (Chambless et al., 1998) criteria for categorizing empirically supported treatments. In order for a treatment to be considered “well-established” the treatment must be supported by at least two RCTs by different research teams and have showed superiority to placebo or equivalence to a previously established treatment. Makel et al. (2012) found that replications were more likely to be significant when carried out by the same researchers as the original study, underscoring the importance of replication by independent teams. The specific requirement that a treatment is replicated by an independent team makes it even less understandable that replication studies are so rarely performed.

The CBT effectiveness studies meta-analytically reviewed by Hans and Hiller (2013) had methodological limitations as would be expected in studies with nonrandomized designs. Of the included studies specific limitations included risk of bias due to lack of control of third variables, lack of reported attrition rates and completer analyses instead of intent-to-treat analyses. The authors stress the need for more high-quality studies to be conducted due to the inherent methodological limitations in the existing body of empirical data. However, the methodological limitations from nonrandomized clinical effectiveness studies must be viewed in a different framework than should the results of RCT efficacy studies. A central aim of an effectiveness study is to establish the clinical effectiveness, and to conclude if the treatment is effective, feasible and acceptable when delivered at a routine clinic to consecutively referred patients.

In order to assess clinical effectiveness on relevant primary and secondary outcomes in the present thesis, systematic assessment of all patients undergoing treatment at the clinic will be implemented. In the following section a brief description of relevant topics for assessment will be presented.

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## 1.12 Clinical Effectiveness in the OCD Clinic

In the treatment of OCD main primary outcome measures will be related to disorder specific assessment, including interviews and self-report measures. In addition to these instruments, several secondary outcome measures may be relevant to include when assessing patients undergoing treatment for OCD.

### 1.12.1 Depression

Depression is among the most common comorbid conditions in patients with OCD (Crino & Andrews, 1996a). Although it is not established that comorbid depression negatively influence treatment outcome for OCD (Knopp, Knowles, Bee, Lovell, & Bower, 2013), there is research to suggest that depressive symptoms are ameliorated following treatment of OCD (Anholt et al., 2011). Depressive symptomatology should be assessed in order to evaluate if these symptoms actually are altered following treatment of OCD or if additional treatment interventions targeting the depression are necessary. This is relevant as research shows that quality of life in OCD patients is more severely affected in patients with high comorbidity, with depression accounting for most of the variance (Huppert et al., 2009). Consequently structured interviews should be applied before treatment to establish comorbidity, and self-report measures should be used to assess severity of depressive symptoms.

### 1.12.2 Occupational functioning

OCD is a debilitating illness with severe impairment of working abilities (Bobes et al., 2001). Functional impairment is commonly experienced among patients with OCD. Research shows that it is commonly reported that OCD patients are unable to work, with lost income as a consequence (Mancebo et al., 2008). Functional impairment is recognized in the DSM-IV as one of the key symptoms of OCD, still occupational dysfunction has received little attention in empirical research (Markarian et al., 2010). In treatment studies, reduction of OCD symptoms receives more focus. For example the Y-BOCS is often the main treatment outcome scale, which primarily

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assesses frequency and distress related to obsessions and compulsions, and the item assessing impairment is broadly defined. A systematic review on work related treatment outcome identified only four studies on treatment of OCD that focused on these aspects (Noordik, van der Klink, Klingen, Nieuwenhuijsen, & van Dijk, 2010), which indicates that this topic has received little attention in the treatment literature.

Given that OCD is known to cause considerable work impairment it is a relevant research topic to what extent treatment leads to increased occupational functioning, in addition to reduction in OCD symptoms. To investigate the degree to which patients have improved occupational functioning after treatment is a topic that should be investigated to a greater extent as a secondary outcome measure. The systematic review by Noordik et al. (2010) showed inconclusive results with regard to what extent CBT has an effect on work related impairment, which may be due to the limited empirical body reviewed with only four OCD studies included. To investigate if patients return to work after treatment this must be assessed during the follow-up period after treatment.

### *1.12.3 Treatment acceptance*

Treatment acceptance is in the present thesis defined as constituted by three main components: Refusal rate, attrition rate, and treatment satisfaction. Firstly, refusal rate is understood as if a patient declines the offer of treatment. Franklin and Foa (1998) estimated that 25% of OCD patients refuse the offer of treatment due to exposure therapy being too frightening to undergo, however, many studies do not assess if patients apprehended the treatment principles in order to make a well informed decision. . In order for this to be a valid indicator of acceptance it must be ensured that the patient is able to make an informed decision, for which the Borkovec and Nau (1972) *Reaction to treatment scale* has been applied (e.g. Vogel et al., 2004). This scale assesses the patient's degree of expectancy and credibility of the treatment.

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Secondly, attrition is an indicator of a patient's acceptance of treatment as patients who drop out cannot be expected to accept the treatment. A drop-out rate of 25-30% has commonly been reported (Franklin & Foa, 1998), and higher premature dropout rates have been observed in patients with higher symptom severity (Aderka et al., 2011). Thirdly, a patient's self-reported treatment satisfaction is a direct measure of treatment acceptance. The participating patients' degree of satisfaction with the treatment process and outcome can be assessed both by self-report questionnaires as well as clinician administered interviews.

### 1.13 Research Aims

The main research aims addressed in the present thesis were the following:

1. To provide an updated state of the art meta-analysis for the treatment of OCD, applying traditional meta-analytic approaches combined with an evaluation of the methodological quality in the CBT studies for OCD. Specific aims were to evaluate potential moderators of treatment outcome, evaluate methodological quality, and provide recommendations for enhanced methodological stringency (Paper I).
2. To assess the clinical effectiveness of a novel ERP treatment format, *Concentrated Exposure Treatment* (cET), delivered at a routine clinic for OCD. Specific aims were to investigate the following questions (Paper II and III):
  - a. Will the patients accept the treatment format?
  - b. Will the treatment format yield significant changes in primary outcomes?
  - c. Will the treatment format influence symptoms of depression and work impairment?

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3. To investigate whether or not the cET treatment format is replicable for a new sample of OCD patients. Specific aims were to investigate the following questions (Paper IV):
    - a. Whether or not the treatment results of a new patient sample in Paper IV are comparable to the initial sample in Paper III
    - b. Whether treatment results are comparable when treatment is delivered by mainly new therapists

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## 2. Methods and Results

A presentation of the main methods and results of the four papers included in the current thesis will be provided in this section. For a more detailed description, please refer to the Methods and Results sections of the individual papers attached.

### 2.1 Paper I: “Cognitive behavioral treatments of obsessive-compulsive disorder. A systematic review and meta-analysis of studies published 1993–2014.”<sup>2</sup>

#### 2.1.1 Research aims

Research aims of Paper I were to provide an updated systematic review and meta-analysis of CBT studies for OCD published 1993–2014, and to conduct a methodological review of the included studies in order to provide recommendations for improved methodological quality in future research. Further, potential treatment moderators were investigated.

#### 2.1.2 Procedures and methods

A total 37 studies were included in the meta-analysis following electronic searches in the PsychINFO and PubMed databases. The criteria for inclusion in the meta-analysis were 1) studies applying the clinician administered Yale-Brown Obsessive-Compulsive (Y-BOCS; Goodman et al., 1989), 2) randomized controlled trials, and 3) treatment with CBT (CBT, CT or ERP) for OCD. Results on the primary outcome measures (Y-BOCS) at the time of pre-treatment, post-treatment and follow-up were extracted for calculation of effect sizes. All studies were evaluated according to Öst (2008) *Psychotherapy outcome study methodology rating form*. Potential moderators were identified and extracted.

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<sup>2</sup> In Paper I CBT refers to treatment with CBT, CT or ERP.

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### 2.1.3 Statistical analyses

Scores on the clinician administered Y-BOCS were used to calculate effect sizes. Separate measures for depression and general anxiety were included in separate calculations. Effect sizes were calculated as  $(M_{\text{active treatment}} - M_{\text{comparison}}) / SD_{\text{pooled}}$ . The effect sizes were calculated separately for post- and follow-up assessments. Potential moderators were investigated with subgroup analyses or meta-regression analyses. The meta-analysis was conducted using the statistical software Comprehensive Meta-Analysis version 2.2.057 (CMA; Biostat Inc., 2006).

### 2.1.4 Summary of results

The results from studies comparing CBT to waiting list and placebo conditions, the results indicated very large effect sizes favoring CBT (1.31 and 1.33, respectively). Comparisons between individual and group treatment (0.17) and comparisons between exposure and response prevention vs. cognitive therapy (0.07) were small and non-significant. The results showed that CBT was significantly more effective than was antidepressant medication (0.55), but CBT + medication was not better than CBT + placebo (0.25). The meta-analysis revealed a number of methodological problems in the included studies and addressed suggestions for improved methodological quality in future research, highlighting the need to gain consensus concerning cut-off scores for response and remission in the field of OCD treatment research.

## 2.2 Common Methodological Aspects of Paper II, III and IV

### 2.2.1 Procedure

All patients were referred to the specialist health care due to severe OCD and accepted the offer of treatment. After screening sessions, the patients participated in the four-day treatment program described below. Patients were systematically evaluated throughout the treatment course at pre-treatment, post-treatment, and at three-, and six-months follow-up.

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### 2.2.2 *The cET format*

The treatment format described in Paper II, III and IV (*Concentrated Exposure Treatment; cET*) is developed by Gerd Kvale (GK) and Bjarne Hansen (BH) and combines elements from both individual and group treatment. Prior to initiation of treatment groups, the patients meet for screening sessions covering structured clinical interviews to assess diagnoses, assessment of symptom severity of OCD, and general psychoeducation of the treatment. Each group consists of 3-7 patients and the same number of therapists. This ensures adequate therapist resources to sufficiently tailor the treatment to each patient. It also provides the individual patient with opportunities to observe how the same principles are applied to other patients suffering from OCD with different types of obsessions and compulsions. The individual patient does not necessarily perform the exposure training with the same therapists all the time during the two days of exposure (Day 2 and 3).

*Day 1:* Duration: 3 hours. To ensure that all patients are provided with a detailed understanding of the treatment principles, on the first treatment day the patients meet together for psychoeducation (1.5 h) and detailed planning of individual exposure tasks to be conducted in the days to follow. Instead of constructing exposure tasks according to a pre-defined exposure hierarchy, the patients are encouraged to suggest exposures that would be expected create the most profound and useful changes, and especially to ensure that the exposures cover the most challenging obsessions and compulsions. The exposures are not aimed at disconfirmation of expectations or at anxiety reduction, but rather on fully approaching all triggers, recognize the urge to avoid or neutralize and then approach (“lean in”) rather than avoiding or neutralizing (“hold back”). The patients are explained that the core element of the treatment is to practice this approach to emotional regulation whenever they recognize an opportunity.

*Day 2 and 3:* Duration: 8-10 hours. These two days are reserved for exposure training. Treatment is therapist-assisted to help the patients to practice the principles of



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“leaning into discomfort”. Furthermore, the exposures are not aimed at disconfirmation of expectations or at anxiety reduction, but rather on fully approaching all triggers without holding back. Typically, exposures are conducted in the most relevant contexts (home, workplace, etc.), and if possible, combinations of different class of triggers are approached simultaneously. Loop-tapes with the patient-recorded discomfoting scenarios to increase the uncertainty in a given situation are frequently used. From 9 a.m. to 4 p.m. the group meets briefly in the morning, at lunch and at 3.30 in the afternoon to share experiences. The remaining time is typically dedicated to individual therapist assisted exposure practice. Typically the 8-10 hours are characterized by focused exposures combined with normal small-talk, laughs and humor, where the therapists actively ensure that the uncertainty triggered by the exposures also is highlighted and processed during periods of small-talk. From 4 p.m. to 9 p.m. each patients typically practice on their own, and sends SMSs to the therapist when they have completed a given tasks. In these SMSs they are instructed to rate their own success of “leaning into the anxiety” on a 1-6 scale where 6 indicates that they are not holding back. When the patients are tempted to start ritualizing or to hold back, they are encouraged to rather increase discomfort (“do the opposite of what the OCD is demanding”). At 9 p.m. all patients have a brief communication with the therapist, typically only an SMS. If they rate themselves 4 or lower on the “leaning into the anxiety” scale, the therapist trouble-shoot for example by having a short talk aimed at assisting the patient to stick to the task of leaning fully into the anxiety or discomfort. A 2-hour psycho-educative meeting for family and friends is arranged on the afternoon on day 3. During this session the general treatment principles are covered, with a specific focus on family accommodation issues.

*Day 4:* Duration: 3-4 hours. On the final day of treatment no exposure assignments is conducted. Rather, the main focus is to summarize the lessons learnt during treatment. The patients also make plans for the following three weeks, with the focus being on how to implement the treatment principles in the daily life, to make sure that the principle of “leaning into the anxiety” becomes an integrated part of

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normal life. Relapse prevention is also addressed with specific advice on how to keep practicing the principles of ERP in the time following treatment.

*Post-treatment practice:* During the three weeks after treatment, patients practice the treatment principles on their own in order to implement the changes in their natural environment. Patients complete self-report questionnaires to monitor the extent to which they adhere to the treatment principles (e.g. if complete response prevention is still practiced).

*Follow up:* Three months after treatment the patients are invited for a follow-up session. As part of the regular assessment of clinical effectiveness the Y-BOCS is administered by an independent rater over telephone three and six months after treatment.

### 2.2.3 Therapists

Each treatment group was led by an experienced clinical psychologist in the team. One of the developers (BH) of the cET format had several years of experience as the head of an in-patient clinic for OCD-treatment as well as had extensive training and practice in CBT for anxiety disorders exceeding 10 years of experience with OCD (Hansen, Vogel, Stiles, & Gøtestam, 2007). The other developer (GK) had more than 30 years of clinical experience and more than 10 years of experience with one-session treatment of specific phobia (Haukebø et al., 2008; Vika, Skaret, Raadal, Öst, & Kvale, 2009) in addition to several years of experience with a 4-day treatment format for chronic fatigue (Hansen, Kvale, Stubhaug, & Thayer, 2013). Except from BH and GK, the number of therapists in Paper II was six. A total of six groups are included in the Paper III sample. In Paper IV there were six therapists, of whom no-one participated in the treatment groups reported in Paper III. The developers of cET (GK and BH) were in charge of two of the ten groups in Paper IV. In the remaining eight groups GK and BH were available on request for consultation but did not participate actively otherwise. Please refer to Table 3 for an overview of therapist overlap in Paper III and IV. Except for GK and BH the therapists were clinical psychologists and

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a psychiatrist who initially started out with very limited experience with treatment of OCD. An integrated part of the therapist training consisted of the less experienced therapists observing and taking part in treatment sessions led by the experienced therapists. Parallel with the treatment described in the present thesis the therapists were undergoing a national ERP training program (Kvale & Hansen, 2014). The national training program was led by internationally recognized experts of OCD treatment and research, including Professor Jonathan Abramowitz (University of North Carolina), Associate Professor Martin E. Franklin (University of Pennsylvania) and Professor Joseph A. Himle (University of Michigan). The program included days 2 x 3 days of lectures and workshops, in addition to clinical supervision.

#### *2.2.4 Outcome assessment*

All patients met diagnostic criteria for OCD according to the administration of the Mini International Neuropsychiatric Interview (M.I.N.I.; Sheehan et al., 1998).

Severity of OCD was assessed using the Y-BOCS, and an independent clinical psychologist administered assessments at post- and follow-up. The severity of symptoms of depression was assessed using the Beck Depression Inventory (BDI; Beck, Steer, & Brown, 1996). In Paper II, a specifically developed interview concerning treatment satisfaction was conducted on the final day of cET, in addition the patients rated satisfaction with the treatment on a 1-6 Likert scale. Treatment satisfaction was assessed using the Client Satisfaction Questionnaire (CSQ-8; Larsen, Attkisson, Hargreaves, & Nguyen, 1979) in Paper III and IV.

### **2.3 Paper II: “Intensive group treatment of obsessive-compulsive disorder: A pilot study”**

#### *2.3.1 Research aims*

The primary aim of Paper II was to assess patients’ acceptability of a new treatment format developed and delivered at a routine clinic. In addition we aimed at

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investigating changes on primary measures of OCD symptoms and secondary outcome measures of depressive symptoms and occupational functioning.

### *2.3.2 Therapists*

The therapists in Paper II are equal to those in Paper III. See Table 3 for details.

### *2.3.3 Sample*

The sample in Paper II consisted of six OCD patients.

### *2.3.4 Statistical analyses*

In accordance with Kazdin (2011) recommendations for single case designs, statistical analyses were not conducted. Instead, descriptive statistics were obtained for each participant.

### *2.3.5 Primary and secondary outcome measures*

The pre-treatment Y-BOCS mean score for the whole sample was 23.5 points (range 19–32). The mean score at post-treatment was 5.7 (range 3–14). Follow-up assessment at one month follow-up showed a mean score of 6.5 (range 3–14), at three months it showed 5.8 (range 3–9) and at six months, it showed a score of 6.3 (range 0–14). All patients were classified as recovered at post-treatment and at the follow-up assessment.

The pre-treatment mean BDI score for the six patients was 15.6 (range 3–29). The mean score at post-treatment was 12.8 (range 6–22). The follow-up assessment at three months showed a mean score of 11.8 (range 1–22).

### *2.3.6 Treatment acceptance*

No patients declined the offer of treatment and there was no attrition. The interview regarding treatment acceptability showed an overall high degree of

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acceptance of the treatment format. No patients would have preferred standard treatment to the concentrated treatment format.

Patients were asked to evaluate the treatment each session day using a six-point Likert scale from 1 (*not satisfied*) to 6 (*very satisfied*). All scores were 5 or 6, indicating a very high degree of patient satisfaction. All patients chose the concentrated treatment rather than weekly treatment sessions and all patients stated that they would recommend the treatment to a friend suffering from OCD.

### *2.3.7 Occupational functioning*

At the three-month follow-up, five of the six patients reported having resumed working or studying.

## **2.4 Paper III: “Concentrated ERP delivered in a group setting: An effectiveness study.”**

### *2.4.1 Research aims*

The primary aim of Paper III was to evaluate the patient acceptability of the *Concentrated Exposure Treatment* (cET) in a large group of treatment seeking OCD patients. The paper also aimed at evaluating the immediate and long term treatment outcomes in terms of changes on primary and secondary outcome measures.

### *2.4.2 Sample*

Thirty-seven patients participated in two initial screening sessions prior to treatment. Two patients declined the offer of treatment. Thirty-five patients (69% females) underwent treatment in a total number of six groups.

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### 2.4.3 *Statistical analyses*

Repeated measures ANOVA for Y-BOCS and BDI were conducted. Cohen's *d* was used for calculation of effect sizes. All statistical analyses were conducted using IBM SPSS Statistics version 22.0.

### 2.4.4 *Primary outcome*

There was a significant reduction in severity of OCD symptoms at post-treatment and this result was maintained at the three- and six-month follow-ups. For the 74 % of patients who had a history of previous treatment, number of previous treatment trials was unrelated to treatment outcome. There was a significant reduction in symptoms of depression from pre- to post-treatment, with lasting effects at follow-up.

### 2.4.5 *Clinically significant change*

Applying Jacobson and Truax (1991) criteria for clinical improvement, at post-treatment, 77% of the sample was classified as recovered, 11% as improved and 11% showed no change. At the six-month follow-up, 74% were classified as recovered, 14% were improved and 11% were unchanged.

### 2.4.6 *Treatment acceptance*

Two of 37 patients (5.4 %) who were offered treatment declined participation due to shame related to the content of obsessions and fear of being recognized by other participants in the groups. Both were offered individual treatment. One patient (3 %) dropped out of treatment due to lack of motivation for adhering to the principles of exposure and response prevention.

At post-treatment, 31 patients completed the CSQ-8. Sixty-nine percent described the quality of treatment as excellent and 66% stated they were satisfied with

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the extent of treatment. All patients stated that they would return to the clinic in the incidence of future relapse. Overall, the CSQ-8 results showed a high degree of patient satisfaction with the treatment.

#### *2.4.7 Occupational functioning*

Fifteen of the 18 patients who, at pre-treatment, had reported OCD-related impairment at work or studies described a positive change at the 12-month follow-up, indicating that 83% of the sample experienced substantial improvement at work or studies following treatment.

### **2.5 Paper IV: “Concentrated ERP delivered in a group setting: A replication study”**

#### *2.5.1 Research aims*

The primary aims of Paper IV were to investigate treatment acceptability and treatment outcomes of a new sample of patients undergoing cET, delivered by mainly other therapists than the originators of cET (see Table 3). An central aim was to compare the results with those obtained in Paper III to investigate if the treatment was replicable in a new sample treated by other therapists.

#### *2.5.2 Sample*

The sample consisted of 42 patients (67% females).

#### *2.5.3 Procedure*

The procedures used in Paper IV were equal to those used in Paper III.

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#### 2.5.4 *Outcome assessment different from Paper II and III*

The Work and Social Adjustment Scale (W-SAS; Mundt, Marks, Shear, & Greist, 2002) was administered to assess OCD related work and social impairment. Due to a change in assessment measure for depressive symptoms at the clinic, BDI was not administered to all patients and is therefore not reported.

#### 2.5.5 *Statistical analyses*

Statistical analyses on the Y-BOCS were conducted using a linear mixed-effects model. Fixed effects were time (pre- and post-treatment, and six-month follow-up), comorbidity and type of previous treatment. The number of additional sessions was included as a covariate. The patient was included as a random intercept and a scaled identity residual matrix was used. Jacobson and Truax (1991) procedure was used to calculate clinically significant change. Categorical variables were analyzed using chi square analyses. All statistical analyses were conducted using IBM SPSS Statistics version 22.0.

#### 2.5.6 *Primary outcome*

The linear mixed effects model showed reductions in OCD symptoms from pre- to post-treatment, which were maintained at the follow-up assessment. Comorbidity, previous treatment and number of additional sessions in treatment did not show a significant effect. To test for therapist effects, the groups led by the developers of the cET (BH and GK) were compared to groups led by other therapists (Table 3), revealing non-significant differences. The majority of patients expressed very high levels of treatment satisfaction.

#### 2.5.7 *Treatment acceptance*

No patients declined the offer of treatment and there was no dropout. Treatment satisfaction was high, with a mean CSQ-8 score of 29.6 (SD 2.5) after treatment.



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#### *2.4.5.2 Clinically significant change*

At post-treatment, 73.8% of the sample was categorized as recovered, 9.5% as improved and 16.7% as unchanged. At the six-month follow-up, 59.5% were recovered, 16.7% improved and 23.8% unchanged.

#### *2.4.5.3 Occupational functioning*

Seventy-three percent of the sample reported a positive change in work interference six months after treatment.

#### *2.4.5.4 Replication study*

Pre-treatment characteristics were compared in Papers III and IV. Significantly more patients received concurrent psychotropic treatment in Paper III, while all other pre-treatment demographic variables were not statistically different.

The Y-BOCS primary outcome measure was analyzed using a linear mixed model. Time and Time x Group analyses revealed only significant effects for time. The proportion of patients obtaining clinically significant changes in the two studies was compared, yielding non-significant differences between the samples at post-treatment and follow-up. Treatment satisfaction was equally high in the two samples and improvement in work impairment was equal.

Table 3. Overview of therapist overlap in Paper III and IV. Shaded area indicates data from Paper III.

Therapist initials	Group number	Paper III							Paper IV							Total			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14		15	16	
GK	X	X	X	X	X	X	X								X				
BH	X	X	X	X	X	X													
PP	X	X	X	X	X	X													
EH	X	X	X	X	X														
AH	X		X	X		X													
HN		X		X	X	X													
RF	X				X	X													
ER	X				X	X													
TB							X	X	X	X	X	X	X	X		X	X		
AM							X	X	X	X	X	X	X	X	X		X		
MS							X	X	X	X	X	X	X	X	X		X		
EØ							X	X	X	X	X	X	X	X					
SS							X	X	X	X	X	X	X	X			X		
NB								X	X	X	X	X	X	X		X	X		
Number of therapists		7	5	5	6	6	6	4	5	6	3	5	3	4	4	4	4	4	77

### **3. Discussion**

The papers in the present thesis highlighted several issues related to the treatment of OCD. Paper I provided a review of the methodological quality of all RCTs of CBT for OCD published 1993–2014 that used clinician administered Y-BOCS. CBT was supported as the treatment of choice for OCD and was superior to the medication, placebo and waiting list conditions, and the treatment was efficacious in many different formats. However, several methodological problems in the empirical body of OCD studies were identified. Papers II, III and IV provide an example of assessment of clinical effectiveness of a novel treatment format (*Concentrated Exposure Treatment; cET*) delivered at a routine clinic. Based on a systematic assessment of all patients undergoing treatment, the cET treatment was evaluated in an initial small scale pilot study (Paper II), followed by an effectiveness study (Paper III), and the replicability of the treatment was demonstrated in a systematic replication series (Paper IV). The results showed that cET was an acceptable treatment format with promising effects on primary and secondary outcome measures.

#### **3.1 Research aim 1: Systematic Review and Meta-analysis of CBT for OCD**

##### *3.1.1 Meta-analysis on CBT for OCD*

A central aim of Paper I was to provide an updated systematic review and meta-analysis of treatment of OCD including all RCTs that used the clinician administered Y-BOCS. Prior to the meta-analysis conducted in Paper I, Olatunji et al. (2013) conducted the most recent meta-analysis on psychological treatment for OCD and studies comparing CBT with WLC or placebo controls were included. The main aim of this approach is to investigate whether the active treatment is superior to what is considered non-active treatment. As would be expected based on the vast empirical body showing that CBT outperforms passive controls, the results from Olatunji et al. (2013) clearly favored active treatment conditions. Paper I extends the meta-analyses that have been published previously and the percentage of overlap with previous

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meta-analyses relevant for comparison (averaged to nearest %) were 0% (Abramowitz, 1998; van Balkom et al., 1994), 3% (Abramowitz, 1997; Kobak et al., 1998), 5% (Abramowitz, 1996), 19% (Abramowitz et al., 2002), 22% (Eddy et al., 2004; Olatunji et al., 2013) and 24% (Rosa-Alcázar et al., 2008), which is a clear demonstration of the originality of the systematic review and meta-analysis in Paper I.

Before Olatunji et al. (2013), Rosa-Alcázar et al. (2008) conducted the most comprehensive meta-analysis on psychological treatment of OCD. A literature search revealed that more than 20 RCTs had been published since Rosa-Alcázar et al. (2008) study, which means that there was a substantial increase in treatment studies not previously analyzed in meta-analyses of adults. This is also evident from the included studies in Paper I, of which only nine overlapped with the sample in Rosa-Alcázar et al. (2008) study. Paper I provided a comprehensive evaluation of the methodological quality in all CBT studies for OCD from 1993 until 2014.

The results in Paper I showed that CBT is superior to waiting list and placebo conditions, with very large effect sizes. In comparison with the waiting list, the overall effect size was 1.31 in favor of CBT and for placebo, the comparison was 1.33. The effect sizes for comparisons between individual and group therapy were small and non-significant (0.17), with similar results for comparisons between ERP and cognitive therapy (0.07). Moreover, CBT is efficacious when delivered in many different formats with comparable treatment outcomes, which clearly supports the robustness of the treatment principles. The comparisons between CBT and SSRI conditions were significantly different and in favor of CBT (0.55). Adding SSRI medication did not augment the effect of CBT, and the effect sizes for CBT plus medication were small and non-significantly different from the CBT plus placebo condition.

In light of the findings of Paper I it is interesting to study the clinical guidelines provided by NICE (2006). It is suggested that if a patient has not

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responded from ten hours of CBT, a course of SSRI could be offered instead of additional CBT sessions, due to the argument that these treatments are comparably efficacious. A preliminary interpretation of the results from Paper I is that the clinical recommendation was not supported by our results, as CBT was superior to SSRI. However, this interpretation must be treated cautiously. Only four comparisons of CBT and drug were analyzed, as we included only studies with CBT as the main active treatment. Thus no studies of head-to-head comparisons of drugs were included. However, Y-BOCS change scores in the comparisons of CBT and placebo in Paper I were more than three times higher than the difference between SSRIs and pill placebo in a meta-analysis of pharmacological treatment of OCD (Soomro, Altman, Rajagopal, & Oakley-Browne, 2008). Thus it may tentatively be concluded that CBT is associated with larger changes on the Y-BOCS severity scale than achieved by SSRIs. Furthermore, the NICE (2006) guidelines recommend that OCD patients with severe functional impairment should be offered a combined treatment of CBT (with ERP) and SSRI. Again, these recommendations are not supported by the results of Paper I, which showed that the effect of CBT was not augmented by concurrent SSRI. Again, these interpretations must be considered tentatively as our results were based on only six comparisons of ERP + placebo and ERP + medication.

In summary, the results from the systematic review and meta-analysis in Paper I clearly support CBT as an efficacious treatment of choice for OCD. The results showed that CBT was significantly better than were antidepressants in the treatment of OCD and the effect of CBT was not augmented by adding antidepressants.

### *3.1.2 Assessment of methodological quality in Paper I*

Another aim of Paper I was to provide an evaluation of methodological quality in the adult treatment literature on CBT for OCD systematically reviewing all included studies on methodological aspects according to the *Psychotherapy outcome study methodology rating form* by Öst (2008). As discussed below, even though methodological aspects have been covered to a limited degree in some of the

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previously published meta-analyses, the methodological quality has not been investigated to the same extent as Paper I in earlier meta-analyses.

In Paper I, the *Psychotherapy outcome study methodology rating form* by Öst (2008) was applied to rate all included studies, using 22 items on a zero-to-two scale. When the 20-year inclusion period was divided in half to compare the methodological quality in each decade, there was a demonstrable increase in methodological rating scores in favor of the most recent ten year period, which is a promising finding indicative of improved methodological quality in the more recent RCTs. This finding contrasts Öst's (2008, 2014) two previous meta-analyses, which applied the same rating scale and showed no increase in methodological stringency for ACT over two successive decades. Moreover, the results in Paper I revealed no relationship between methodological quality and effect sizes, contrary to previous research on ACT (Öst (2014). This finding is encouraging as it might indicate that the treatment outcome of OCD treatment research is not biased by the methodological quality of the studies. Öst (2008) also found that the methodological quality in ACT RCTs were inferior to the CBT treatment literature, and in the second meta-analysis (Öst, 2014), it was concluded that ACT did not lead to significantly higher effect sizes compared to CBT.

However, despite the abovementioned promising findings, the methodological review in Paper I also revealed several methodological problems in the OCD treatment literature. One of the most striking findings was the frequent conclusion of equal results in many studies comparing two treatments with non-significant differences. Twenty-two of the included RCTs that compared two active treatments found non-significant differences, although 50% of these drew conclusions about equivalent outcomes. This is potentially problematic because, as discussed in Paper I, one cannot conclude with equivalence unless a non-inferiority or an equivalence design has been applied (Walker & Nowacki, 2011). Three of the included RCTs did, however, have a large enough cell size of 30 or more, as suggested in the APA Division 12 Task Force criteria (Chambless et al., 1998) to test equivalence in a

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superiority design without doing so. The results show that this is a methodological consideration not widely used in treatment studies of OCD, clearly representing an area for increased methodological stringency.

A related methodological issue concerns the application of a power analysis before deciding on the sample size. A very low mean score on the item assessing power analysis was demonstrated, and the analysis revealed that many studies were clearly underpowered. Although 97% had sufficient power to detect a large effect size, none would have detected a small effect size (Kazdin, 2003). This shows that the OCD research field has substantial room for improvement regarding power analyses, which is very similar to psychotherapy research in general. Kazdin (2003) recommendations for increased statistical power should thus be welcomed and applied.

Another methodological problem identified in Paper I concerns the investigation of the potential influence of comorbidity on treatment outcome. Only 21 (57%) of the included studies reported proportions of Axis I or II comorbidities. As a consequence, one must be cautious when estimating the prevalence rate of comorbidities on the basis of the available research literature, given the risk of bias due to comorbidity being generally underreported in treatment studies. This also has consequences when testing the relationship between comorbidity and treatment gains in meta-analyses, as there is a risk of undetected relationships influencing treatment outcomes in studies that fail to conduct a structured diagnostic interview and report the results. The question regarding the relationship between comorbidity and treatment gains clearly needs to be addressed in future research, both in individual treatment studies, as well as in meta-analyses and systematic reviews.

### *3.1.3 Assessment of response*

The Y-BOCS is the “gold standard” for symptom measurement in OCD (Frost et al., 1995). Even still, it is somewhat unexpected to note the large variability in method for assessing treatment outcome and the way Y-BOCS is applied to establish symptom change. As is evident from the methodological review in Paper I, some

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studies apply percentage reduction, which is not an ideal measurement as this is dependent on the baseline score (Farris et al., 2013). Consequently, a severely affected patient may have a large reduction in Y-BOCS scores from pre- to post-treatment, but nevertheless still be in the clinical range without this being detected by the statistical analyses (Farris et al., 2013). Lewin et al. (2011) pointed out that a patient with a pre-treatment Y-BOCS score of 38 might have a 50% symptom reduction to 19 and still have moderate symptom severity. In Paper I, 21 studies (57%) included data on treatment response and 20 (54%) reported clinically significant change. Of the studies that used Jacobson and Truax (1991) or similar criteria, the cut-off score varied from  $\leq 7$  to  $\leq 16$ . Considering that many studies use a Y-BOCS score of  $\geq 16$  as inclusion criterion (Farris et al., 2013), this score may appear too lenient to use as a cut-off.

A consensus is clearly warranted with regard to what criteria for clinically significant change should be applied. It should thus be welcomed that recent research has been conducted in order to provide recommendations for optimal outcome criteria (Lewin et al., 2011; Farris et al., 2013) based on Y-BOCS score following treatment. It remains to be seen whether these recommendations will be implemented in future research.

The Y-BOCS is, in itself, not an unproblematic scale. The Y-BOCS is not very sensitive to change, and the developers have pointed out that a severely affected person may have a small but meaningful reduction in symptoms following treatment without the Y-BOCS detecting it score (Storch et al., 2010). For example, a patient can have a decrease in time occupied by obsessions from 16 hours to eight hours of obsessions, i.e. a 50% reduction, without the change being reflected in the total Y-BOCS score (Storch et al., 2010). The division of separate items for obsessions and compulsions is also problematic. A patient may experience frequent and time consuming obsessions after treatment, but refrain from ritualizing in accordance with the treatment principles. Due to the remaining obsessional symptoms, this patient may earn an increased total Y-BOCS score, even though the individual is no longer disturbed in his or her daily life.



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To address the inherent limitations of the Y-BOCS, the developers adapted the original Y-BOCS to a modified version – the Y-BOCS-II (Storch et al., 2010). Several improvements were implemented. For example, item 4 (“Resistance to obsessions”) was removed, as this item had the lowest correlation with the Y-BOCS total score. The developers also chose to increase the scale range from 0–40 to 0–50 to make it more sensitive to change, especially for patients in the extreme symptom severity end. Unfortunately, this extended total score represents a challenge when comparing the scores obtained from the new Y-BOCS-II to the vast literature on the Y-BOCS-I. Hence, so far, the Y-BOCS-II does not seem to have reached the point of being widely used.

#### *3.1.4 Treatment moderators*

Paper I also aimed at assessing moderators of treatment outcome. Of the categorical variables, completer analyses yielded larger effect sizes than did ITT analyses, passive control conditions (waiting list) gave a higher effect size than did active control conditions, individual treatment was better than group treatment and studies that assessed therapist competence had a higher effect size than did those that did not. In Paper I, the RCTs with both active and passive controls were included. The finding that the waiting list condition yielded higher effect sizes may be expected from previous research (Cunningham, Kypri, & McCambridge, 2013). This is an important reminder for researchers in the treatment of OCD to aim at including active control conditions in future RCT studies to minimize the well-known risk of inflated effect sizes from comparisons with passive control conditions (Hrobjartsson & Gotzsche, 2001; Shadish, 2011). That completer analyses yields higher effect sizes has been corroborated in many previous meta-analyses (Hofmann & Smits, 2008; Loerinc et al., 2015). This implies that using completer analysis may inflate the treatment results, as patients who are retained are more likely to show positive treatment effects than do those who drop out. Paper I showed that mainly older studies applied completer analyses, whereas newer studies tended towards using ITT analyses, which is a promising development.

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Of the continuous moderators investigated, three were significantly related to treatment outcome: higher proportion of women, higher mean age and higher proportion of patients with antidepressant medication were all related to lower effect size. That gender was related to outcome was a surprising finding. Although some gender differences in OCD have been found in children, these results typically show a higher prevalence in males (Geller, Biederman, Jones, Shapiro, et al., 1998; Hanna, 1995). Gender was not related to outcome in the meta-analyses by Rosa-Alcázar et al. (2008) and Olatunji et al. (2013), nor in the systematic review of predictors of OCD treatment outcome by Knopp et al. (2013). That older patients had poorer treatment outcome may be due to longer illness duration and perhaps less expectancy of treatment. However, illness duration has not systematically been found to predict treatment outcome, and treatment expectancy was not analyzed in Paper I due to few studies reporting treatment expectancy. Olatunji et al. (2013) also found that older age was related to lower effect sizes for child and adult studies combined, but when the adult studies were analyzed separately this association was not significant. That higher proportion of patients with concurrent antidepressant medication was associated with lower effect sizes, may be due to poorer motivation in adhering to the CBT treatment principles, but treatment motivation and patients' adherence to treatment was not assessed in a sufficient number of studies to control for this in Paper I. Although it would be plausible to suspect that patients with concurrent medication had more severe symptoms, the moderator analysis of pre-treatment Y-BOCS in the placebo-controlled studies showed that higher severity was related to better treatment outcome. That CBT is an effective treatment for OCD, irrespective, at least to a large extent, of patient characteristics is perhaps also illustrated by the recent predictor study on pediatric OCD, which concluded that the only significant predictor of treatment outcome was age, with younger children having better treatment outcomes (Torp et al., 2015).

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### 3.1.5 Rating of methodological quality in Paper I and previous meta-analyses

The value of the update on the methodological review provided in Paper I can be evaluated by comparing the review of the methodological data with the methodological reviews that were provided in previous meta-analyses on CBT for OCD. All of the methodological aspects in Table 2 were assessed for all included studies in Paper I. The degree of overlap of the methodological rating with the previous meta-analyses can be detected by comparing the ratings of previous meta-analyses displayed in Table 2 with Paper I. *Background data, treatment data and primary outcome measure* were covered by 100% of the previous meta-analyses. This was expected since these variables are commonly covered in systematic reviews and meta-analyses. A comparison of CBT types was also covered by 100% of previous meta-analyses, which is also expected given that the relevant meta-analyses reviewed the CBT treatment literature for OCD. With respect to the remaining variables in Table 2, *reliability of the outcome measure* and *within-group effect size* were reported in 67% of the meta-analyses, *rating of methodological quality* was discussed in 44%, and *control of drug treatment, assessment of response and remission, rating of risk of bias* and *response* were addressed in 33%. *Reliably diagnosing the participants, adherence and competence ratings, independence and blindness of raters* and *remission* were addressed in 22%. *Statistical power, number of therapists* and *credibility ratings* were assessed by 0%.

Rosa-Alcázar et al. (2008) did conduct an evaluation of methodological issues in the included studies, but they did not rate studies according to a specific rating form. Instead, methodological aspects were rated according to dichotomous variables and a zero-to-five scale was used to rate only overall treatment design. This approach to the evaluation of methodological quality did not provide a scale with sufficient range to investigate the relationship between methodological quality and effect sizes in sufficient detail. Rosa-Alcázar et al. (2008) meta-analysis showed a preliminary relationship between effect size and attrition. From more thorough statistical analyses, it was concluded that an outlier explained this effect, and the effect

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vanished when the outlier was removed from the analysis. However, the restricted range of the scale applied by Rosa-Alcázar et al. (2008), and the majority of methodological aspects being rated on dichotomous variables, are important limitations of the methodological review in the meta-analysis.

### **3.2 Research aim 2: Systematic Assessment of Clinical Effectiveness of a New ERP Format**

#### *3.2.1 Treatment acceptability of cET*

A central aim of Paper II, III was to investigate patients' acceptance of a novel ERP treatment format. In the present thesis treatment acceptance was defined as comprising proportion of patients declining treatment participation, proportion of patients dropping out prematurely, and patients' reported treatment satisfaction.

The results showed high treatment acceptability: In Paper II no patients declined participation and no one dropped out. In Paper III, the majority of patients (94.6%) accepted the offer of treatment and only two patients (5.4%) declined participation. The attrition rate was very low, with only one patient (3%) dropping out prematurely.

The assessment of treatment acceptability was a main area of investigation, given the brief period in which treatment was delivered. For the collection of routine data, systematic assessment of all patients undergoing treatment at the clinic was implemented, which enabled the assessment of measurement of patients' acceptance of the treatment format throughout the whole treatment course. On the final treatment day, a survey was used to assess different aspects related to satisfaction and treatment acceptance. This was conducted as an interview and covered 13 topics relevant to the treatment process, outcome and beliefs about maintenance of treatment gains.

Perhaps of particular importance is the finding that the patients rated the treatment alliance as good even though the treatment was delivered by a group of therapist and that the patient were assisted by different therapists throughout the two

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days of exposures. This result is interesting, since seems to challenges the notion that a necessary prerequisite for clinical change is the quality of the therapeutic alliance (Martin, Garske, & Davis, 2000), typically defined as trust in the one person who is responsible for the treatment in addition to agreement on goals and methods (Bordin, 1979). These are relevant findings, as previous research has indicated that therapists often have concerns related to the patients' ability to tolerate high levels of distress during exposure therapy (Olatunji, Deacon, & Abramowitz, 2009), and especially fear that high levels of anxiety might impair the working alliance (Addis, Wade, & Hatgis, 1999). Given the demanding high amount of exposure tasks that the patients engaged in together with the group of therapists over two intensive days, the strong therapeutic relationship reported by the patients is a promising finding.

The results from Paper III also showed promising results in terms of patient satisfaction. Of the 35 patients in the sample, 100% expressed a high or very high degree of satisfaction with the extent of treatment, as assessed using the CSQ-8. All patients stated they would return to the clinic if they needed treatment for OCD in the future. Also on the remaining items, patients expressed an overall high or very high degree of treatment satisfaction. An interesting finding with respect to treatment satisfaction is the high number of patients who were satisfied with *the extent of treatment*, which is remarkable for a four-day treatment approach. However, the patients underwent several hours of exposure exercises during the cET, allowing for exposure to multiple contexts within only four days; the same amount of treatment hours would take considerably longer to conduct if the patient were to undergo treatment once- or twice weekly, which is the common format in public healthcare.

### 3.2.2 Primary outcomes of cET

In Paper II, there was marked clinical improvement for all patients, with a large mean reduction in Y-BOCS-assessed symptom severity. The mean that Y-BOCS scores were highly reduced from pre-treatment (mean 23.5, range 19–32) to post-treatment (5.7, range 0–11). During the follow-up period, these results were maintained and at the final assessment, the mean Y-BOCS score was 6.3 (range 0–

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14). Fisher and Wells (2005) calculated a cut-off point to establish if a patient's post-treatment score was within the normal or dysfunctional distribution. They suggested a cut-off score of 14 points or below, and it is noteworthy that at all post-treatment and follow-up assessments points in Paper II, all of the patients' Y-BOCS scores were 14 or lower, indicating good effects for all patients.

Paper III showed significant improvements on primary outcomes. By applying Jacobson and Truax (1991) criteria for clinically significant change, at post-treatment, 77% of the sample were recovered, 11% were improved and 11% showed no change. Due to the application of strict criteria for clinically significant change, two patients who were classified as unchanged had post Y-BOCS scores below 14, but did not have reliable change (a 10-point Y-BOCS total score reduction). At six-month follow-up, 74% were recovered, 14% improved and 11% unchanged. These promising results show that the cET was associated with significant changes in OCD symptoms, and the results were maintained during the follow-up period.

In Paper III we investigated if treatment outcome was related to history of previous treatment, defined as number of previous treatment trials. These results were not significant. Further, in Paper IV we investigated if comorbidity as well as treatment history were related to the treatment gains. The results showed no significant effect of comorbidity or number of previous treatment trials. Due to the small sample size these investigations of treatment predictors these findings must be treated cautiously, as the studies are clearly underpowered to detect relationships of medium or small magnitude.

Another caution must be advised with respect to what conclusions are possible to draw concerning specific treatment aspects of cET that may influence the treatment outcome. The investigation of the potential influence on outcome of variables like motivation, treatment expectations and compliance with homework was not the scope of the current thesis; however, these aspects would be highly interesting to study in a larger sample.

Also, even though Paper IV represents a replication study, all treatment studies in the present thesis are conducted by the same research group, and based on the

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inherent methodological weaknesses in uncontrolled studies (Nathan, Stuart, & Dolan, 2000), the results concerning the replicability of cET should be regarded with some caution until controlled studies, preferably from independent research groups, have been conducted.

### 3.2.3 *Secondary outcomes of cET*

Another research aim was related to whether or not the cET led to treatment gains on secondary outcome measures. Paper II included an assessment of depressive symptoms, and the results showed that there was a reduction in BDI-assessed depressive symptomatology from pre-treatment (mean 15.6, range 3–29), to post-treatment (mean 12.8, range 6–22) and three months after treatment (mean 11.8, range 1–22).

In Paper III, both symptoms of depression and work or study impairment were assessed. There was a significant reduction in symptoms of depression that was maintained during the follow-up period of six months. In addition, work and study impairment was assessed 12 months after treatment, with results showing a marked reduction in OCD-related work impairment. Altogether, the cET was associated with good treatment outcomes on secondary outcome measures. These results might indicate that the patients actually managed to change some important dysfunctional patterns of emotional regulation during the two days of exposure training, and that they were able to integrate the change as a part of normal life. Firm conclusions related to if and when change in these area actually took place was not the scope of the current thesis, and in future studies it would be of interest to track the individual changes during both the four days of treatment as well as the three-week period with self-exposure training following the treatment.

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### 3.3 Research Aim 3: The replicability of cET

The final research question was related to the replicability of the cET. Overall, the results on primary and secondary outcome measures in Paper IV were not statistically different from Paper III, indicating that the results in Paper III were replicated. However, it must be emphasized that Paper III and IV were conducted by the same research team in an uncontrolled design limits, and due to these methodological limitations the results must be interpreted with caution. With this precaution in mind, the studies still provide useful and important information with respect to the replicability of cET.

As evident from a recent study investigating the reproducibility of psychological research (Open Science Collaboration, 2015), few psychology studies are reproducible. Makel et al. (2012) showed that replications of clinical psychology studies are not frequently conducted, and from 100 psychology journals they found a replication rate of only 1%. In addition, when successfully replicated, the effect sizes in replication studies are often lower compared to in the original research. Following this, an important aim of Paper IV was to investigate whether or not treatment outcomes from successive patient samples treated at the same clinic were comparable. In Paper IV, a sample of patients undergoing treatment with cET during the period following the inclusion in Paper III were assessed, and the results were statistically compared with the results of Paper III to investigate the replicability of cET.

The demographic variables in the two samples were comparable. With the exception of the results showing that there were significantly more patients receiving concurrent SSRI treatment in the Paper III sample, the remaining demographic variables were equal in the two samples.

The Y-BOCS scores were compared in Papers III and IV to investigate differences in the primary outcome. Mean scores from all assessment points were statistically analyzed and the results showed that there were no significant differences between the samples. Clinically significant change is a more informative outcome



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measure than is statistically significant change. In accordance with Jacobson and Truax (1991) recommendations for calculating clinically significant change, the proportion of recovered, improved and unchanged patients was compared in the samples. The results showed that there were no significant differences between the samples with respect to proportions with clinically significant change.

Also, assessment of treatment acceptability and occupational functioning were compared. The results concerning treatment satisfaction, as assessed with the CSQ-8, showed nonsignificant differences between the samples. Overall, the patients in Papers III and IV expressed a very high degree of treatment satisfaction. The attrition rate is also promising as the overall rate in Papers III and IV was 1.3%. This figure may be contrasted with the attrition rate reported in Paper I, which showed a mean attrition rate of 15 % and a median of 11 % in the included studies. The proportion of patients having a positive change in the work or employment situations was also compared, and the results revealed equal proportions of patients with an improved occupational functioning.

An important aspect concerning replicability of a treatment is the degree to which the treatment can be delivered by different therapists with similar outcomes. Obviously, the ideal replication would be conducted by a different research group, and as such the current replication has clear methodological challenges. Nevertheless, the results of the present thesis provide some preliminary support for the replicability of the treatment format when delivered by different therapists. In Paper III, all treatment groups were led by the developers of the cET, whereas in Paper IV, only two groups were led by the developers and the remaining groups had other lead therapists. Also, the overlap between the therapists in Paper III and IV is limited. The replication study showed that the treatment outcome in groups led by the developers and the remaining groups did not differ significantly, thus implying that the cET is generalizable for delivery by other therapists within the same clinic.

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The patient samples reported in Papers III and IV were highly representative of OCD patients, as characterized by high levels of symptom severity and a long duration of the disorder. In Paper III, the mean duration was 16.7 years, with a SD of more than ten years. In Paper IV, the mean duration was 14.5 years, with a similar SD as in Paper III. In addition, the majority (74%) of patients in both studies reported previous treatment. The rate of comorbidity was also high in the samples. Based on the symptom severity and history of previously unsuccessful treatment trials, many of the patients would be candidates for inpatient treatment, as suggested in the NICE (2006) clinical guidelines. With this in mind, it is promising that the results in Papers III and IV showed a high number of recovered patients, in addition to the results showing no relationship between outcome and comorbidity or treatment history. There seemed to be a positive effect on symptoms of depression for patients undergoing treatment, with both Papers II and III showing reduced levels of depression symptom severity after treatment. However, due to a change in use of outcome measure for depression during the period in which the patients reported in Paper IV underwent treatment, the effect on depression was not possible to replicate in Paper IV.

Although the replicability of the cET appears promising as indicated by the nonsignificant differences between Paper III and IV, as mentioned, some caution when interpreting the results must be noted. Makel et al. (2012) found that statistically significant replications were more likely when the replication was conducted by the same research team as the original study, as indicated by the results showing that of the successful replications more than half were conducted by the same research group as the original study. The most important limitation concerning the replicability of cET is thus that the replication study in Paper IV was conducted by the same research group as in Paper III.

For a treatment to be empirically supported as a well-established treatment, the APA Division 12 Task Force on Promotion and Dissemination of Psychological Procedures (Chambless et al., 1998; Chambless et al., 1996) a treatment must have

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been empirically supported by two independent research teams preferably in randomized controlled trials demonstrating the efficacy of the treatment. If all the research is carried out by the same research group the treatment would be considered *possibly efficacious* according to the APA task force. To further investigate the replicability of cET, future studies should be conducted by independent research teams. In order to meet the APA criteria, treatment studies should include randomization to a control group.

In summary, Paper IV offers a demonstration a replication study of a novel treatment format delivered in a routine clinic, based on the systematic assessment of patient change. Although the replication of Paper III was not conducted by an independent group, it provided promising preliminary results which should be further investigated in future research.

### **3.4 The cET format and Severe and Treatment Refractory OCD Patients**

The NICE (2006) clinical guidelines recommend inpatient treatment as an alternative for patients with severe and/or treatment refractory OCD. A potential challenge regarding this clinical recommendation is that there is no clear consensus concerning what defines a treatment resistant patient. To be treatment resistant can e.g. be operationalized as patients who have undergone one or several treatment courses of recommended treatment for OCD (CBT with ERP) without clinically significant change. Another definition could be patients who repeatedly relapse after initial successful treatment courses.

Also, it is unclear if number of previous therapy trials is informative in terming patients as treatment refractory. If previous treatment is a moderator of treatment outcome was not investigated in Paper I as only 13 (35%) of the included studies provided information about this. In addition, there was considerable variation in the number of patients having received previous treatment, ranging from 0–100% with 60.1% as the mean. It is also of interest to note that the patient samples undergoing

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cET presented in this thesis were characterized by having severe symptoms before treatment and most patients – 74 % in both Paper III and IV – had unsuccessfully tried previous treatment, including CBT and exposure therapy. The high numbers of improved and recovered patients in Paper III and IV, as well as analyses showing that previous treatment attempts were unrelated to treatment outcome in both studies, are thus promising findings. Relevant research questions that should be addressed in future studies therefore concern 1) whether or not there are some patients who are resistant to treatment, and 2) if yes, what characterizes these patients, for example, the number of previous treatment trials, symptom severity, duration of illness, comorbidity and treatment motivation.

In their systematic review of predictor studies of OCD, Knopp et al. (2013) found six studies that investigated treatment history as a potential predictor of treatment outcome and none showed a significant relationship with treatment outcome. However, Knopp et al. (2013) concluded that there were substantial limitations to the quality of the assessment of predictors in the studies analyzed, thus there are still many unanswered questions with respect to predictors of treatment outcome. The urge for improved methodological stringency is thus shared by Paper I and Knopp et al. (2013) in pointing out that methodological weaknesses limit the opportunity for conclusions to be drawn about what predicts treatment response.

As evident from the moderator analyses provided in Paper I, high symptom severity was not found to impair treatment outcome; to the contrary, high levels of pre-treatment OCD symptoms was associated with better treatment outcome. In a study of inpatient treatment for severely affected OCD patients, Brennan et al. (2014) found that higher baseline OCD severity predicted a greater percentage of symptom decrease following treatment, which is in accordance with the results in Paper I.

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### 3.4.1 *cET Compared to Intensive Treatment Formats*

The term “intensive” has been applied to various treatment formats for OCD. Originally, the term “intensive” referred to treatments with daily sessions over three weeks to distinguish it from treatment formats with spaced treatment sessions (e.g. twice-weekly sessions; Abramowitz et al., 2003). In this case “intensive” refers to the duration in time that treatment is delivered. This could be contrasted to the intensity of treatment as referring to how much distress or discomfort is experienced by the patient during treatment. An example of the latter could be whether the patient underwent gradual exposure starting with the least anxiety provoking tasks, as opposed to flooding; or if partial or complete response prevention was implemented. The problematic issue of how to define intensive treatment was illustrated in Jónsson, Kristensen, and Arendt (2015) recent meta-analysis, which reviewed intensive CBT for OCD. One of the inclusion criteria was that treatment duration should not exceed four weeks. Of the included studies, the reported duration was one to four weeks, the session length varied from 50 min to four hours, and the total number of treatment hours varied from 10 to 30. Evidently, there was a marked variation in the included studies with regard to what was “intensive”.

The cET treatment format deviated from the intensive treatment formats described previously, for example, treatment formats with daily sessions for three consecutive weeks (Abramowitz et al., 2003). Although the cET treatment format may be described as “intensive” due to the many hours of treatment over two days of exposure, for the present thesis it was useful to differentiate between intensive treatment and concentrated treatment. Concentrated treatment is characterized by treatment delivered over a short duration in terms of number of days and the total duration of time under exposure is high. Thus, the number of therapy hours in cET is comparable to the 16-hour individual treatment manual from Kozak and Foa (1997). cET has more in common with other concentrated ERP formats. Shikatani et al. (in press) described a nine-day format with exposure sessions lasting two to four hours. This study and cET are examples of brief treatments that allow the patient to return to

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the home environment very rapidly and implement the treatment strategies in the daily life. By differentiating cET from what has typically been termed intensive OCD treatment, it may be argued that cET shares more similarities with the brief treatments developed for other anxiety disorders, for instance social phobia (Wells & Papageorgiou, 2001), post-traumatic stress disorder (Ehlers et al., 2014), specific phobia (Davis III, Ollendick, & Öst, 2012), and panic disorder (Craske, Maidenberg, & Bystritsky, 1995), than what has traditionally been termed intensive in the OCD treatment literature.

There are some notable differences between cET and the team approach described in the Shikatani et al. (in press) case study. cET is delivered over four days with only two consecutive days of exposure. This allows for exposure to multiple contexts during several continuous hours. The high therapist–patient ratio and the continuity of therapist contact may help the patient “stay on track” with the exposure assignments, allowing for the therapist to spot potential barriers during treatment and address them immediately. This can be compared to, for example, a once-weekly treatment format, in which the patient is vulnerable with few opportunities for therapist contact outside of therapy sessions.

The cET format may make delivering treatment particularly feasible due to several important factors. Compared to treatment with daily sessions of short duration, the four-day format with many treatment hours delivered over two days of exposure, may be less susceptible to variation due to patient factors. The patient is prevented from drifting from the treatment principles because the initial parts of treatment are concerned with the patient learning how to practice the exposure assignments and adhere to the response prevention in a limited number of assignments, closely supervised by the therapist, before the patient starts to practice a number of exposure tasks in multiple situations and contexts. However, these specific aspects of the cET were not investigated in the papers included in the present thesis.

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### **3.5 Assessment of Clinical Effectiveness**

#### *3.5.1 Clinical effectiveness*

Many years ago, Kazdin (1994) argued in favor of implementing systematic assessment of patients undergoing treatment in mental healthcare settings. Unfortunately, this has yet to become an integrated part of public healthcare, although Kazdin (2006) repeatedly has proposed specific recommendations for how to implement such systematic patient assessments. This thesis provides an example of how this can be achieved.

Kazdin (2006) pointed out that there are different study designs that are informative when conducting assessments and research on effectiveness in clinical practice. Assessment of individual patients in a case series is an example, as provided in Paper II. This pilot study with six patients undergoing treatment showed that the treatment approach was highly acceptable, thus opening for larger scale studies. Paper III extends the pilot study with a larger open effectiveness study of 35 patients, which is replicated in Paper IV.

Although the RCT is often recognized as the ultimate research design for psychotherapy treatment studies (Kendall, 2003), this may not be the most ideal format when evaluating treatment outcomes at a routine clinic setting. Goldfried and Wolfe (1998) argued that controlled trials are of limited value if they lack clinical validity and recommended certain measures to be undertaken in order to increase a study's ecological validity. As noted by Lambert (2001), the ecological validity of a treatment is much more informed by studies taking place in naturalistic settings, where patients normally receive health care. Effectiveness studies can be argued to be a more suitable approach to establishing the ecological validity of a treatment. RCTs are often conducted in strictly controlled settings that may not necessarily be transferable to the ordinary clinical setting. Studies that are conducted within routine clinics are more informative in this regard. An alternative research option is therefore to study clinical effectiveness and evaluate whether or not the treatment outcome in a

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clinic is replicable over time. Based on the effectiveness research on cET in Paper II, III and IV it may be argued that the cET approach has high ecological validity. The treatment was conducted on patient sample without exclusion criteria and the patients were highly representable for the disorder as evident from high symptom severity, long duration of illness duration, a high degree of comorbidity and a substantial history of previous unsuccessful therapy trials.

It has been argued that many patients are offered sub-optimally delivered CBT (Shafran et al., 2009), which may be partly explained by the therapist's lack of training. In Papers II, III and IV, all therapists were part of a clinic where they as part of their training were working side-by-side with experienced therapists in order to observe the treatment interventions. This type of hands on training also allows for direct feedback from the experienced therapist to the novice. The cET format may be argued to be very transparent with respect to protocol adherence and by the frequent meetings where the patients shared their treatment experiences. Thus, cET may be a format that allows for close adherence to the treatment manual. As Shafran et al. (2009) pointed out, it is a threat to empirically supported treatments when they are delivered without adherence to the manual, leaving the patient with suboptimal therapy based on a treatment that works. As Waller (2009) pointed out, therapist drift is a common process involving a shift from "doing therapies" to "talking therapies" (p. 119), which means that less time is spent on behavior change and increased time is spent on talking. This is illustrated in Hansen et al. (2007) study, which showed that patients who underwent ERP and cognitive therapy had less time for exposure due to the cognitive interventions that opened up time for talking, leaving less time for exposure work, with results indicating a somewhat reduced treatment outcome.

### *3.5.2 cET in relation to effectiveness research on OCD*

In a recent review, Öst (2013) summarized the literature on effectiveness and efficacy trials of CBT for OCD to investigate if the treatment evaluated in efficacy



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studies can be disseminated to the routine clinic. Öst (2013) identified 59 RCTs on CBT for OCD and rated the clinical representativeness of the identified studies according to four of ten items on Shadish et al.'s (2000) rating scale. By comparing the effect sizes obtained in effectiveness studies with the mean effect size from efficacy studies of OCD, out of 21 studies, Öst (2013) found that 12 effectiveness studies had poorer effect, six had equal results and three had better results compared to the mean in the efficacy studies. The average effect size was 2.25 in efficacy studies and 1.89 in effectiveness studies, which was not significantly different.

To compare the treatment effect of cET with the effectiveness studies analyzed by Öst (2013), the effect size from the combined samples in Papers III and IV can be applied, as the replication study in Paper IV yielded nonsignificant differences between the samples. The within-group effect sizes Öst (2013) reported were calculated using the formula  $ES = (M_{pre} - M_{post})/SD_{pre}$ . The average Y-BOCS score for the samples in Papers III and IV at pre-treatment was 25.9 (SD 4.31), at post-treatment was 9.97 (SD 4.36) and at six-month follow-up was 11.32 (SD 6.13). By using the same formula as Öst (2013), this yields a post-treatment effect size of 3.7 and a follow-up effect size of 3.38. For within-group effect sizes, 0.5 is considered small, 0.8 is medium and 1.1 is large (Öst, 2013). The effect sizes obtained from the combined treatment outcome from Papers III and IV can thus be regarded as very large. By comparing this result with the outcome for effectiveness studies reported in Öst (2013) work, the treatment outcome from cET can be considered promising. The effect sizes obtained in cET must be treated with caution, due to the abovementioned well-known statistical finding that within-group effect sizes tend to be larger compared to between-group effect-sizes (Lakens, 2013).

### **3.6 Methodological Quality in the Present Thesis**

In order to investigate the methodological quality of the effectiveness data presented in Papers II, III and IV, the three papers were rated according to the criteria

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in Öst (2008) *Psychotherapy outcome study methodology rating form*. This scale was originally developed to rate the methodological quality in RCT studies, which is reflected in some of the items. Item 9 (assignment to treatment) is related to the procedure for assigning participants to treatment conditions (e.g. whether or not patients were randomly assigned), item 10 (design) assesses the type of design (e.g. whether or not the active treatment group was compared to another active treatment) and item 22 (equality of therapy hours) rates whether or not the amount of therapy differed between conditions (for non-WLC designs). Understandably, items 9, 10 and 22 will not be applicable to a treatment study with only one treatment condition, and a score of 0 points must be given. However, it is still possible to rate an uncontrolled study on the remaining 19 items. When rating Paper II, the paper obtained 22 points, which was equal to 50% of the maximum 44 points. Papers III and IV both scored 25 points, which was equal to 57% of the maximum points. The mean score of Papers II, III and IV was 24 (SD 1.73), which was equal to 55% of the maximum score. The mean score of the 37 studies analyzed in Paper I was 23 (SD 4.73), which was 52% of the possible maximum scoring range. The difference between Paper I and the mean score of Papers II, III and IV was not statistically significant,  $t(38) = 0.35, p = .73$ . This illustrates that sound methodological quality may also be achieved when systematically evaluating treatment outcome in an effectiveness study and replication study, rather than with a RCT.

In summary, through systematic evaluation and by analyzing results in effectiveness trials and replication series, one may also achieve good methodological quality and representative results in the ordinary clinic setting. With these considerations in mind, it seems even less understandable that systematic assessment in public healthcare is so rarely performed.

### **3.7 Implications for Future Research**

The present thesis offers two main implications for future research. The primary implication is based on the methodological quality review in Paper I. It is

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recommended that the field of OCD research take specific actions in order to enhance the methodological stringency. It is suggested that the methodological quality in OCD treatment research is reanalyzed in ten years according to Öst (2008) scale to evaluate if there has been increased methodological quality following the recommendations put forward in this thesis.

Paper I provides some direction for future RCT studies on the treatment of OCD in order to improve methodological quality in the research field. Most importantly, Paper I addresses several methodological aspects that should be improved in future research. The results in the meta-analysis indicate that in RCT designs patients should not be randomized to WLC or placebo conditions, as there is no reason to expect treatment gains from such passive controls. Instead, active treatments should be compared. However, as pointed out, a power analysis must be conducted initially and the sample size adjusted accordingly, with a large enough sample to allow for superiority designs in order to test for differences between treatments. A promising trend was detected, with studies in the later ten-year inclusion period having a higher mean methodological rating compared to the studies in the first period, indicating an increased methodological stringency over time in OCD treatment research. It is hoped that this trend continues, perhaps aided by adhering to the recommendations above.

The second area of research implications regards effectiveness research. Even though this has not been a research question in the current thesis, systematic assessment of treatment variables at a public healthcare clinic has been a prerequisite for data collection. The collected data and treatment results hold high ecological quality. It may be argued that the integration of effectiveness research as part of ordinary clinical care is important for two reasons. First, whether or not the empirically supported treatments for OCD are disseminated in routine clinics needs to be established. As Shafran et al. (2009) discussed, there is still a long way to go before patients who could benefit from OCD are offered this as the first line treatment. Second, whether or not patients who are receiving treatment for their OCD

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have the clinical gains that would be expected based on the available research needs to be established. Future research on clinical effectiveness from routine clinics should be conducted to improve dissemination and establish means for improving the adequacy of the treatment delivered.

In order to establish the evidence base for the cET treatment format, future larger scale research and controlled studies by independent research groups are needed. Nevertheless, it may be argued that the present thesis provides useful preliminary information of the effectiveness of cET. In particular this is due to the studies not having been conducted in the traditional top down linear scientific progress. This top down approach is typically initiated with an efficacy study, thereafter the treatment is disseminated to the routine clinic and the treatment is investigated in an effectiveness study. In contrast to this top down approach, the thesis proposes a bottom up strategy in which a treatment approach is initially described in small scale study. Only when the treatment is accepted and demonstrates feasible efficacy are additional studies warranted. In line with this argument, a suggestion is made for further research using larger scale controlled trials in which patients are randomized to cET and an active control condition.

Following the treatment processes and outcomes reported in Papers II, III IV, there are several suggestions for future effectiveness studies in routine clinical settings. The findings that show comparable results using different treatment formats may have implications for future research. Given that CBT/ERP is effective for OCD irrespective of the presentation method should encourage researchers to investigate novel ways of providing treatment, given that a substantial number of patients who receive treatment either do not improve or experience a setback or relapse.

A final area for future research concerns the replicability of the cET approach. Although the treatment format was well accepted by the patients and led to promising treatment gains, the format should be investigated by an independent research team in future studies in order to establish the replicability of the treatment.

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### 3.8 Implications for Clinical Practice

For the treatment of OCD, the present thesis offers some important implications for clinical practice. CBT was shown to yield better treatment outcomes compared to the use of antidepressant medication, and adding antidepressant medication to CBT did not augment treatment effects. A suggested implication for clinical practice is that CBT should be the first line of treatment and one may not expect medication to enhance the treatment effect. However, as the main aim of Paper I was to investigate studies with CBT as the primary treatment, this clinical implication must be considered tentative.

The results from the meta-analysis showed that ERP and CT yielded similar treatment effects. This finding has clinical implications and suggests that there is no need to combine ERP with CT, given that each alone is supported as an effective treatment. However, although CBT can be delivered in different formats, the treatment delivered should always be rooted in a treatment manual in order to ensure that the documented effective treatment components are in fact included in the treatment. Furthermore, no significant differences were found between group and individual treatment. These results imply that both formats are efficacious for OCD, indicating that the mode of treatment application matters less when treatment patients with CBT.

Some suggestions for clinical practice may also be offered based on the evaluation of the cET. By delivering treatment in the format of individualized treatment in a group format one may achieve advantages from both individual treatment and group treatment. The 1:1 patient-therapist ratio ensures a high degree of therapist assisted exposure, which is known to be important for clinical change. Also, the group format may enhance treatment motivation in patients by allowing for mutual support between the patients.

As demonstrated in Papers II, III and IV, cET represents a novel treatment format that has been evaluated and shows promising treatment outcomes. For a

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patient with OCD, rapid symptom reduction following four days of treatment means rapid reduction of impairment, which is demonstrated in Papers III and IV, showing that patients experienced better work-related functioning. Thus, the social and economical benefits are clear, as the concentrated treatment allows the patient to return to work at a much faster pace compared to treatments with a lower interval between sessions.

The concentrated format may also have implications for the dissemination of treatment. For a patient living at a long distance from the clinic, traveling to the psychiatric unit once a week may be very time consuming. Undergoing treatment in only four days will the patient to come to the center during the treatment days, and thus have a low total number of days traveling.

### **3.9 Conclusions**

#### *3.9.1 Research aim 1*

Paper I provides a systematic review and meta-analysis of CBT for OCD. The low degree of overlap of reviewed studies compared to previous meta-analyses that are relevant for comparison, Paper I may be argued to represent a substantial update on the empirical support for CBT in the treatment of OCD. The methodological review provided in Paper I exceeds the assessment of methodological aspects that have been conducted previously and recommendations for how to increase methodological quality in future research is provided.

#### *3.9.2 Research aim 2*

The second research aim was related to acceptance of cET, as well as treatment outcome on primary and secondary measures. Overall the treatment format had high acceptability, as indicated by low attrition rates, a low number of patients declining the offer of treatment, as well as high self-reported treatment satisfaction in Paper II,

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and III. Further, the patients had large treatment gains in terms of reduction of OCD symptoms, depressive symptoms, and improved occupational functioning.

### *3.9.3 Research aim 3*

The third research aim was related to the replicability of cET. Paper IV showed that a new patient sample, treated with mainly other therapists than the originators of cET, had high treatment gains on primary and secondary outcome measures. Treatment acceptability was also high evident from no patients declining the offer of treatment, no attrition and high treatment satisfaction. There were no statistically significant differences between Paper IV and Paper III, indicating that the cET is a replicable treatment format. However, it is recommended that the treatment format is investigated by independent research teams in future studies.

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**Doctoral Theses at The Faculty of Psychology,**  
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<b>1980</b>	Allen, H.M., Dr. philos.	Parent-offspring interactions in willow grouse ( <i>Lagopus L. Lagopus</i> ).
<b>1981</b>	Myhrer, T., Dr. philos.	Behavioral Studies after selective disruption of hippocampal inputs in albino rats.
<b>1982</b>	Svebak, S., Dr. philos.	The significance of motivation for task-induced tonic physiological changes.
<b>1983</b>	Myhre, G., Dr. philos.	The Biopsychology of behavior in captive Willow ptarmigan.
	Eide, R., Dr. philos.	PSYCHOSOCIAL FACTORS AND INDICES OF HEALTH RISKS. The relationship of psychosocial conditions to subjective complaints, arterial blood pressure, serum cholesterol, serum triglycerides and urinary catecholamines in middle aged populations in Western Norway.
	Værnes, R.J., Dr. philos.	Neuropsychological effects of diving.
<b>1984</b>	Kolstad, A., Dr. philos.	Til diskusjonen om sammenhengen mellom sosiale forhold og psykiske strukturer. En epidemiologisk undersøkelse blant barn og unge.
	Løberg, T., Dr. philos.	Neuropsychological assessment in alcohol dependence.
<b>1985</b>	Hellesnes, T., Dr. philos.	Læring og problemløsning. En studie av den perseptuelle analysens betydning for verbal læring.
	Håland, W., Dr. philos.	Psykoterapi: relasjon, utviklingsprosess og effekt.
<b>1986</b>	Hagtvet, K.A., Dr. philos.	The construct of test anxiety: Conceptual and methodological issues.
	Jellestad, F.K., Dr. philos.	Effects of neuron specific amygdala lesions on fear-motivated behavior in rats.
<b>1987</b>	Aarø, L.E., Dr. philos.	Health behaviour and socioeconomic Status. A survey among the adult population in Norway.
	Underlid, K., Dr. philos.	Arbeidsløse i psykososialt perspektiv.
	Laberg, J.C., Dr. philos.	Expectancy and classical conditioning in alcoholics' craving.
	Vollmer, F.C., Dr. philos.	Essays on explanation in psychology.
	Ellertsen, B., Dr. philos.	Migraine and tension headache: Psychophysiology, personality and therapy.
<b>1988</b>	Kaufmann, A., Dr. philos.	Antisocial atferd hos ungdom. En studie av psykologiske determinanter.



	Mykletun, R.J., Dr. philos.	Teacher stress: personality, work-load and health.
	Havik, O.E., Dr. philos.	After the myocardial infarction: A medical and psychological study with special emphasis on perceived illness.
<b>1989</b>	Bråten, S., Dr. philos.	Menneskedyaden. En teoretisk tese om sinnets dialogiske natur med informasjons- og utviklingspsykologiske implikasjoner sammenholdt med utvalgte spedbarnsstudier.
	Wold, B., Dr. psychol.	Lifestyles and physical activity. A theoretical and empirical analysis of socialization among children and adolescents.
<b>1990</b>	Flaten, M.A., Dr. psychol.	The role of habituation and learning in reflex modification.
<b>1991</b>	Alsaker, F.D., Dr. philos.	Global negative self-evaluations in early adolescence.
	Kraft, P., Dr. philos.	AIDS prevention in Norway. Empirical studies on diffusion of knowledge, public opinion, and sexual behaviour.
	Endresen, I.M., Dr. philos.	Psychoimmunological stress markers in working life.
	Faleide, A.O., Dr. philos.	Asthma and allergy in childhood. Psychosocial and psychotherapeutic problems.
<b>1992</b>	Dalen, K., Dr. philos.	Hemispheric asymmetry and the Dual-Task Paradigm: An experimental approach.
	Bø, I.B., Dr. philos.	Ungdoms sosiale økologi. En undersøkelse av 14-16 åringers sosiale nettverk.
	Nivison, M.E., Dr. philos.	The relationship between noise as an experimental and environmental stressor, physiological changes and psychological factors.
	Torgersen, A.M., Dr. philos.	Genetic and environmental influence on temperamental behaviour. A longitudinal study of twins from infancy to adolescence.
<b>1993</b>	Larsen, S., Dr. philos.	Cultural background and problem drinking.
	Nordhus, I.H., Dr. philos.	Family caregiving. A community psychological study with special emphasis on clinical interventions.
	Thuen, F., Dr. psychol.	Accident-related behaviour among children and young adolescents: Prediction and prevention.
	Solheim, R., Dr. philos.	Spesifikke lærevansker. Diskrepanskriteriet anvendt i seleksjonsmetodikk.
	Johnsen, B.H., Dr. psychol.	Brain asymmetry and facial emotional expressions: Conditioning experiments.
<b>1994</b>	Tønnessen, F.E., Dr. philos.	The etiology of Dyslexia.
	Kvale, G., Dr. psychol.	Psychological factors in anticipatory nausea and vomiting in cancer chemotherapy.

	Asbjørnsen, A.E., Dr. psychol.	Structural and dynamic factors in dichotic listening: An interactional model.
	Bru, E., Dr. philos.	The role of psychological factors in neck, shoulder and low back pain among female hospitale staff.
	Braathen, E.T., Dr. psychol.	Prediction of exellence and discontinuation in different types of sport: The significance of motivation and EMG.
	Johannessen, B.F., Dr. philos.	Det flytende kjønnnet. Om lederskap, politikk og identitet.
<b>1995</b>	Sam, D.L., Dr. psychol.	Acculturation of young immigrants in Norway: A psychological and socio-cultural adaptation.
	Bjaalid, I.-K., Dr. philos	Component processes in word recognition.
	Martinsen, Ø., Dr. philos.	Cognitive style and insight.
	Nordby, H., Dr. philos.	Processing of auditory deviant events: Mismatch negativity of event-related brain potentials.
	Raaheim, A., Dr. philos.	Health perception and health behaviour, theoretical considerations, empirical studies, and practical implications.
	Seltzer, W.J., Dr.philos.	Studies of Psychocultural Approach to Families in Therapy.
	Brun, W., Dr.philos.	Subjective conceptions of uncertainty and risk.
	Aas, H.N., Dr. psychol.	Alcohol expectancies and socialization: Adolescents learning to drink.
	Bjørkly, S., Dr. psychol.	Diagnosis and prediction of intra-institutional aggressive behaviour in psychotic patients
<b>1996</b>	Anderssen, N., Dr. psychol.	Physical activity of young people in a health perspective: Stability, change and social influences.
	Sandal, Gro Mjeldheim, Dr. psychol.	Coping in extreme environments: The role of personality.
	Strumse, Einar, Dr. philos.	The psychology of aesthetics: explaining visual preferences for agrarian landscapes in Western Norway.
	Hestad, Knut, Dr. philos.	Neuropsychological deficits in HIV-1 infection.
	Lugoe, L.Wycliffe, Dr. philos.	Prediction of Tanzanian students' HIV risk and preventive behaviours
	Sandvik, B. Gunnhild, Dr. philos.	Fra distriktsjordmor til institusjonsjordmor. Fremveksten av en profesjon og en profesjonsutdanning
	Lie, Gro Therese, Dr. psychol.	The disease that dares not speak its name: Studies on factors of importance for coping with HIV/AIDS in Northern Tanzania
	Øygaard, Lisbet, Dr. philos.	Health behaviors among young adults. A psychological and sociological approach
	Stormark, Kjell Morten, Dr. psychol.	Emotional modulation of selective attention: Experimental and clinical evidence.

	Einarsen, Ståle, Dr. psychol.	Bullying and harassment at work: epidemiological and psychosocial aspects.
<b>1997</b>	Knivsberg, Ann-Mari, Dr. philos.	Behavioural abnormalities and childhood psychopathology: Urinary peptide patterns as a potential tool in diagnosis and remediation.
	Eide, Arne H., Dr. philos.	Adolescent drug use in Zimbabwe. Cultural orientation in a global-local perspective and use of psychoactive substances among secondary school students.
	Sørensen, Marit, Dr. philos.	The psychology of initiating and maintaining exercise and diet behaviour.
	Skjæveland, Oddvar, Dr. psychol.	Relationships between spatial-physical neighborhood attributes and social relations among neighbors.
	Zewdie, Tekla, Dr. philos.	Mother-child relational patterns in Ethiopia. Issues of developmental theories and intervention programs.
	Wilhelmsen, Britt Unni, Dr. philos.	Development and evaluation of two educational programmes designed to prevent alcohol use among adolescents.
	Manger, Terje, Dr. philos.	Gender differences in mathematical achievement among Norwegian elementary school students.
<b>1998</b>		
V	Lindstrøm, Torill Christine, Dr. philos.	«Good Grief»: Adapting to Bereavement.
	Skogstad, Anders, Dr. philos.	Effects of leadership behaviour on job satisfaction, health and efficiency.
	Haldorsen, Ellen M. Håland, Dr. psychol.	Return to work in low back pain patients.
	Besemer, Susan P., Dr. philos.	Creative Product Analysis: The Search for a Valid Model for Understanding Creativity in Products.
H	Winje, Dagfinn, Dr. psychol.	Psychological adjustment after severe trauma. A longitudinal study of adults' and children's posttraumatic reactions and coping after the bus accident in Måbødalen, Norway 1988.
	Vosburg, Suzanne K., Dr. philos.	The effects of mood on creative problem solving.
	Eriksen, Hege R., Dr. philos.	Stress and coping: Does it really matter for subjective health complaints?
	Jakobsen, Reidar, Dr. psychol.	Empiriske studier av kunnskap og holdninger om hiv/aids og den normative seksuelle utvikling i ungdomsårene.
<b>1999</b>		
V	Mikkelsen, Aslaug, Dr. philos.	Effects of learning opportunities and learning climate on occupational health.
	Samdal, Oddrun, Dr. philos.	The school environment as a risk or resource for students' health-related behaviours and subjective well-being.
	Friestad, Christine, Dr. philos.	Social psychological approaches to smoking.

	Ekeland, Tor-Johan, Dr. philos.	Meining som medisin. Ein analyse av placebofenomenet og implikasjoner for terapi og terapeutiske teoriar.
H	Saban, Sara, Dr. psychol.	Brain Asymmetry and Attention: Classical Conditioning Experiments.
	Carlsten, Carl Thomas, Dr. philos.	God lesing – God læring. En aksjonsrettet studie av undervisning i fagtekstlesing.
	Dundas, Ingrid, Dr. psychol.	Functional and dysfunctional closeness. Family interaction and children's adjustment.
	Engen, Liv, Dr. philos.	Kartlegging av leseferdighet på småskoletrinnet og vurdering av faktorer som kan være av betydning for optimal leseutvikling.
<b>2000</b>		
V	Hovland, Ole Johan, Dr. philos.	Transforming a self-preserving "alarm" reaction into a self-defeating emotional response: Toward an integrative approach to anxiety as a human phenomenon.
	Lillejord, Sølvi, Dr. philos.	Handlingsrasjonalitet og spesialundervisning. En analyse av aktørperspektiver.
	Sandell, Ove, Dr. philos.	Den varme kunnskapen.
	Oftedal, Marit Petersen, Dr. philos.	Diagnostisering av ordavkodingsvansker: En prosessanalytisk tilnæringsmåte.
H	Sandbak, Tone, Dr. psychol.	Alcohol consumption and preference in the rat: The significance of individual differences and relationships to stress pathology
	Eid, Jarle, Dr. psychol.	Early predictors of PTSD symptom reporting; The significance of contextual and individual factors.
<b>2001</b>		
V	Skinstad, Anne Helene, Dr. philos.	Substance dependence and borderline personality disorders.
	Binder, Per-Einar, Dr. psychol.	Individet og den meningsbærende andre. En teoretisk undersøkelse av de mellommenneskelige forutsetningene for psykisk liv og utvikling med utgangspunkt i Donald Winnicotts teori.
	Roald, Ingvild K., Dr. philos.	Building of concepts. A study of Physics concepts of Norwegian deaf students.
H	Fekadu, Zelalem W., Dr. philos.	Predicting contraceptive use and intention among a sample of adolescent girls. An application of the theory of planned behaviour in Ethiopian context.
	Melesse, Fantu, Dr. philos.	The more intelligent and sensitive child (MISC) mediational intervention in an Ethiopian context: An evaluation study.
	Råheim, Målfrid, Dr. philos.	Kvinnerens kroppserfaring og livssammenheng. En fenomenologisk – hermeneutisk studie av friske kvinner og kvinner med kroniske muskelsmerter.
	Engelsen, Birthe Kari, Dr. psychol.	Measurement of the eating problem construct.
	Lau, Bjørn, Dr. philos.	Weight and eating concerns in adolescence.

**2002**

- V Ihlebæk, Camilla, Dr. philos. Epidemiological studies of subjective health complaints.
- Rosén, Gunnar O. R., Dr. philos. The phantom limb experience. Models for understanding and treatment of pain with hypnosis.
- Høines, Marit Johnsen, Dr. philos. Fleksible språkrrom. Matematikk læring som tekstutvikling.
- Anthun, Roald Andor, Dr. philos. School psychology service quality. Consumer appraisal, quality dimensions, and collaborative improvement potential
- Pallesen, Ståle, Dr. psychol. Insomnia in the elderly. Epidemiology, psychological characteristics and treatment.
- Midthassel, Unni Vere, Dr. philos. Teacher involvement in school development activity. A study of teachers in Norwegian compulsory schools
- Kallestad, Jan Helge, Dr. philos. Teachers, schools and implementation of the Olweus Bullying Prevention Program.

## H

- Ofte, Sonja Helgesen, Dr. psychol. Right-left discrimination in adults and children.
- Netland, Marit, Dr. psychol. Exposure to political violence. The need to estimate our estimations.
- Diseth, Åge, Dr. psychol. Approaches to learning: Validity and prediction of academic performance.
- Bjuland, Raymond, Dr. philos. Problem solving in geometry. Reasoning processes of student teachers working in small groups: A dialogical approach.

**2003**

- V Arefjord, Kjersti, Dr. psychol. After the myocardial infarction – the wives' view. Short- and long-term adjustment in wives of myocardial infarction patients.
- Ingjaldsson, Jón Þorvaldur, Dr. psychol. Unconscious Processes and Vagal Activity in Alcohol Dependency.
- Holden, Børge, Dr. philos. Følger av atferdsanalytiske forklaringer for atferdsanalysens tilnærming til utforming av behandling.
- Holsen, Ingrid, Dr. philos. Depressed mood from adolescence to 'emerging adulthood'. Course and longitudinal influences of body image and parent-adolescent relationship.
- Hammar, Åsa Karin, Dr. psychol. Major depression and cognitive dysfunction- An experimental study of the cognitive effort hypothesis.
- Sprugevica, Ieva, Dr. philos. The impact of enabling skills on early reading acquisition.
- Gabrielsen, Egil, Dr. philos. LESE FOR LIVET. Lesekompetansen i den norske voksenbefolkningen sett i lys av visjonen om en enhetsskole.
- H Hansen, Anita Lill, Dr. psychol. The influence of heart rate variability in the regulation of attentional and memory processes.
- Dyregrov, Kari, Dr. philos. The loss of child by suicide, SIDS, and accidents: Consequences, needs and provisions of help.

**2004**

- V Torsheim, Torbjørn, Dr. psychol. Student role strain and subjective health complaints: Individual, contextual, and longitudinal perspectives.
- Haugland, Bente Storm Mowatt Dr. psychol. Parental alcohol abuse. Family functioning and child adjustment.
- Milde, Anne Marita, Dr. psychol. Ulcerative colitis and the role of stress. Animal studies of psychobiological factors in relationship to experimentally induced colitis.
- Stornes, Tor, Dr. philos. Socio-moral behaviour in sport. An investigation of perceptions of sportspersonship in handball related to important factors of socio-moral influence.
- Mæhle, Magne, Dr. philos. Re-inventing the child in family therapy: An investigation of the relevance and applicability of theory and research in child development for family therapy involving children.
- Kobbeltvedt, Therese, Dr. psychol. Risk and feelings: A field approach.

**2004  
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- Thomsen, Tormod, Dr. psychol. Localization of attention in the brain.
- Løberg, Else-Marie, Dr. psychol. Functional laterality and attention modulation in schizophrenia: Effects of clinical variables.
- Kyrkjebø, Jane Mikkelsen, Dr. philos. Learning to improve: Integrating continuous quality improvement learning into nursing education.
- Laumann, Karin, Dr. psychol. Restorative and stress-reducing effects of natural environments: Experiential, behavioural and cardiovascular indices.
- Holgersen, Helge, PhD Mellom oss - Essay i relasjonell psykoanalyse.

**2005**

- V Hetland, Hilde, Dr. psychol. Leading to the extraordinary? Antecedents and outcomes of transformational leadership.
- Iversen, Anette Christine, Dr. philos. Social differences in health behaviour: the motivational role of perceived control and coping.

**2005  
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- Mathisen, Gro Ellen, PhD Climates for creativity and innovation: Definitions, measurement, predictors and consequences.
- Sævi, Tone, Dr. philos. Seeing disability pedagogically – The lived experience of disability in the pedagogical encounter.
- Wiiium, Nora, PhD Intrapersonal factors, family and school norms: combined and interactive influence on adolescent smoking behaviour.
- Kanagaratnam, Pushpa, PhD Subjective and objective correlates of Posttraumatic Stress in immigrants/refugees exposed to political violence.
- Larsen, Torill M. B. , PhD Evaluating principals` and teachers` implementation of Second Step. A case study of four Norwegian primary schools.
- Bancila, Delia, PhD Psychosocial stress and distress among Romanian adolescents and adults.

**2006**

V

- Hillestad, Torgeir Martin, Dr. philos. Normalitet og avvik. Forutsetninger for et objektivt psykopatologisk avviksbegrep. En psykologisk, sosial, erkjennelsesteoretisk og teorihistorisk framstilling.
- Nordanger, Dag Øystein, Dr. psychol. Psychosocial discourses and responses to political violence in post-war Tigray, Ethiopia.
- Rimol, Lars Morten, PhD Behavioral and fMRI studies of auditory laterality and speech sound processing.
- Krumsvik, Rune Johan, Dr. philos. ICT in the school. ICT-initiated school development in lower secondary school.
- Norman, Elisabeth, Dr. psychol. Gut feelings and unconscious thought: An exploration of fringe consciousness in implicit cognition.
- Israel, K Pravin, Dr. psychol. Parent involvement in the mental health care of children and adolescents. Empirical studies from clinical care setting.
- Glasø, Lars, PhD Affects and emotional regulation in leader-subordinate relationships.
- Knutsen, Ketil, Dr. philos. HISTORIER UNGDOM LEVER – En studie av hvordan ungdommer bruker historie for å gjøre livet meningsfullt.
- Matthiesen, Stig Berge, PhD Bullying at work. Antecedents and outcomes.

**2006**

H

- Gramstad, Arne, PhD Neuropsychological assessment of cognitive and emotional functioning in patients with epilepsy.
- Bendixen, Mons, PhD Antisocial behaviour in early adolescence: Methodological and substantive issues.
- Mrumbi, Khalifa Maulid, PhD Parental illness and loss to HIV/AIDS as experienced by AIDS orphans aged between 12-17 years from Temeke District, Dar es Salaam, Tanzania: A study of the children's psychosocial health and coping responses.
- Hetland, Jørn, Dr. psychol. The nature of subjective health complaints in adolescence: Dimensionality, stability, and psychosocial predictors
- Kakoko, Deodatus Conatus Vitalis, PhD Voluntary HIV counselling and testing service uptake among primary school teachers in Mwanza, Tanzania: assessment of socio-demographic, psychosocial and socio-cognitive aspects
- Mykletun, Arnstein, Dr. psychol. Mortality and work-related disability as long-term consequences of anxiety and depression: Historical cohort designs based on the HUNT-2 study
- Sivertsen, Børge, PhD Insomnia in older adults. Consequences, assessment and treatment.

**2007**

V

- Singhammer, John, Dr. philos. Social conditions from before birth to early adulthood – the influence on health and health behaviour
- Janvin, Carmen Ani Cristea, PhD Cognitive impairment in patients with Parkinson's disease: profiles and implications for prognosis

	Braarud, Hanne Cecilie, Dr.psychol.	Infant regulation of distress: A longitudinal study of transactions between mothers and infants
	Tveito, Torill Helene, PhD	Sick Leave and Subjective Health Complaints
	Magnussen, Liv Heide, PhD	Returning disability pensioners with back pain to work
	Thuen, Elin Marie, Dr.philos.	Learning environment, students' coping styles and emotional and behavioural problems. A study of Norwegian secondary school students.
	Solberg, Ole Asbjørn, PhD	Peacekeeping warriors – A longitudinal study of Norwegian peacekeepers in Kosovo
<b>2007</b>		
<b>H</b>	Søreide, Gunn Elisabeth, Dr.philos.	Narrative construction of teacher identity
	Svensen, Erling, PhD	WORK & HEALTH. Cognitive Activation Theory of Stress applied in an organisational setting.
	Øverland, Simon Nygaard, PhD	Mental health and impairment in disability benefits. Studies applying linkages between health surveys and administrative registries.
	Eichele, Tom, PhD	Electrophysiological and Hemodynamic Correlates of Expectancy in Target Processing
	Børhaug, Kjetil, Dr.philos.	Oppseding til demokrati. Ein studie av politisk oppseding i norsk skule.
	Eikeland, Thorleif, Dr.philos.	Om å vokse opp på barnehjem og på sykehus. En undersøkelse av barnehjemsbarns opplevelser på barnehjem sammenholdt med sanatoriebarns beskrivelse av langvarige sykehusopphold – og et forsøk på forklaring.
	Wadel, Carl Cato, Dr.philos.	Medarbeidersamhandling og medarbeiderledelse i en lagbasert organisasjon
	Vinje, Hege Forbech, PhD	Thriving despite adversity: Job engagement and self-care among community nurses
	Noort, Maurits van den, PhD	Working memory capacity and foreign language acquisition
<b>2008</b>		
<b>V</b>	Breivik, Kyrre, Dr.psychol.	The Adjustment of Children and Adolescents in Different Post-Divorce Family Structures. A Norwegian Study of Risks and Mechanisms.
	Johnsen, Grethe E., PhD	Memory impairment in patients with posttraumatic stress disorder
	Sætrevik, Bjørn, PhD	Cognitive Control in Auditory Processing
	Carvalho, Susana Fonseca, PhD	Prevention of bullying in schools: an ecological model
<b>2008</b>		
<b>H</b>	Brønnick, Kolbjørn Selvåg	Attentional dysfunction in dementia associated with Parkinson's disease.



	Posserud, Maj-Britt Rocio	Epidemiology of autism spectrum disorders
	Haug, Ellen	Multilevel correlates of physical activity in the school setting
	Skjerve, Arvid	Assessing mild dementia – a study of brief cognitive tests.
	Kjønniksen, Lise	The association between adolescent experiences in physical activity and leisure time physical activity in adulthood: a ten year longitudinal study
	Gundersen, Hilde	The effects of alcohol and expectancy on brain function
	Omvik, Siri	Insomnia – a night and day problem
<b>2009</b>		
<b>V</b>	Molde, Helge	Pathological gambling: prevalence, mechanisms and treatment outcome.
	Foss, Else	Den omsorgsfulle væremåte. En studie av voksnes væremåte i forhold til barn i barnehagen.
	Westrheim, Kariane	Education in a Political Context: A study of Knowledge Processes and Learning Sites in the PKK.
	Wehling, Eike	Cognitive and olfactory changes in aging
	Wangberg, Silje C.	Internet based interventions to support health behaviours: The role of self-efficacy.
	Nielsen, Morten B.	Methodological issues in research on workplace bullying. Operationalisations, measurements and samples.
	Sandu, Anca Larisa	MRI measures of brain volume and cortical complexity in clinical groups and during development.
	Guribye, Eugene	Refugees and mental health interventions
	Sørensen, Lin	Emotional problems in inattentive children – effects on cognitive control functions.
	Tjomsland, Hege E.	Health promotion with teachers. Evaluation of the Norwegian Network of Health Promoting Schools: Quantitative and qualitative analyses of predisposing, reinforcing and enabling conditions related to teacher participation and program sustainability.
	Helleve, Ingrid	Productive interactions in ICT supported communities of learners
<b>2009</b>		
<b>H</b>	Skorpen, Aina Øye, Christine	Dagliglivet i en psykiatrisk institusjon: En analyse av miljøterapeutiske praksiser
	Andreassen, Cecilie Schou	WORKAHOLISM – Antecedents and Outcomes
	Stang, Ingun	Being in the same boat: An empowerment intervention in breast cancer self-help groups
	Sequeira, Sarah Dorothee Dos Santos	The effects of background noise on asymmetrical speech perception

	Kleiven, Jo, dr.philos.	The Lillehammer scales: Measuring common motives for vacation and leisure behavior
	Jónsdóttir, Guðrún	Dubito ergo sum? Ni jenter møter naturfaglig kunnskap.
	Hove, Oddbjørn	Mental health disorders in adults with intellectual disabilities - Methods of assessment and prevalence of mental health disorders and problem behaviour
	Wageningen, Heidi Karin van	The role of glutamate on brain function
	Bjørkvik, Jofrid	God nok? Selvaktelse og interpersonlig fungering hos pasienter innen psykisk helsevern: Forholdet til diagnoser, symptomer og behandlingsutbytte
	Andersson, Martin	A study of attention control in children and elderly using a forced-attention dichotic listening paradigm
	Almås, Aslaug Grov	Teachers in the Digital Network Society: Visions and Realities. A study of teachers' experiences with the use of ICT in teaching and learning.
	Ulvik, Marit	Lærerutdanning som dannning? Tre stemmer i diskusjonen
<b>2010</b>		
<b>V</b>	Skår, Randi	Læringsprosesser i sykepleieres profesjonsutøvelse. En studie av sykepleieres læringserfaringer.
	Roald, Knut	Kvalitetsvurdering som organisasjonslæring mellom skole og skoleeigar
	Lunde, Linn-Heidi	Chronic pain in older adults. Consequences, assessment and treatment.
	Danielsen, Anne Grete	Perceived psychosocial support, students' self-reported academic initiative and perceived life satisfaction
	Hysing, Mari	Mental health in children with chronic illness
	Olsen, Olav Kjellevold	Are good leaders moral leaders? The relationship between effective military operational leadership and morals
	Riese, Hanne	Friendship and learning. Entrepreneurship education through mini-enterprises.
	Holthe, Asle	Evaluating the implementation of the Norwegian guidelines for healthy school meals: A case study involving three secondary schools
<b>H</b>	Hauge, Lars Johan	Environmental antecedents of workplace bullying: A multi-design approach
	Bjørkelo, Brita	Whistleblowing at work: Antecedents and consequences
	Reme, Silje Endresen	Common Complaints – Common Cure? Psychiatric comorbidity and predictors of treatment outcome in low back pain and irritable bowel syndrome
	Helland, Wenche Andersen	Communication difficulties in children identified with psychiatric problems

Beneventi, Harald	Neuronal correlates of working memory in dyslexia
Thygesen, Elin	Subjective health and coping in care-dependent old persons living at home
Aanes, Mette Marthinussen	Poor social relationships as a threat to belongingness needs. Interpersonal stress and subjective health complaints: Mediating and moderating factors.
Anker, Morten Gustav	Client directed outcome informed couple therapy
Bull, Torill	Combining employment and child care: The subjective well-being of single women in Scandinavia and in Southern Europe
Viig, Nina Grieg	Tilrettelegging for læreres deltakelse i helsefremmende arbeid. En kvalitativ og kvantitativ analyse av sammenhengen mellom organisatoriske forhold og læreres deltakelse i utvikling og implementering av Europeisk Nettverk av Helsefremmende Skoler i Norge
Wolff, Katharina	To know or not to know? Attitudes towards receiving genetic information among patients and the general public.
Ogden, Terje, dr.philos.	Familiebasert behandling av alvorlige atferdsproblemer blant barn og ungdom. Evaluering og implementering av evidensbaserte behandlingsprogrammer i Norge.
Solberg, Mona Elin	Self-reported bullying and victimisation at school: Prevalence, overlap and psychosocial adjustment.
<b>2011</b>	
<b>V</b>	
Bye, Hege Høivik	Self-presentation in job interviews. Individual and cultural differences in applicant self-presentation during job interviews and hiring managers' evaluation
Notelaers, Guy	Workplace bullying. A risk control perspective.
Moltu, Christian	Being a therapist in difficult therapeutic impasses. A hermeneutic phenomenological analysis of skilled psychotherapists' experiences, needs, and strategies in difficult therapies ending well.
Myrseth, Helga	Pathological Gambling - Treatment and Personality Factors
Schanche, Elisabeth	From self-criticism to self-compassion. An empirical investigation of hypothesized change processes in the Affect Phobia Treatment Model of short-term dynamic psychotherapy for patients with Cluster C personality disorders.
Våpenstad, Eystein Victor, dr.philos.	Det tempererte nærvær. En teoretisk undersøkelse av psykoterapeutens subjektivitet i psykoanalyse og psykoanalytisk psykoterapi.
Haukebø, Kristin	Cognitive, behavioral and neural correlates of dental and intra-oral injection phobia. Results from one treatment and one fMRI study of randomized, controlled design.
Harris, Anette	Adaptation and health in extreme and isolated environments. From 78°N to 75°S.

	Bjørknes, Ragnhild	Parent Management Training-Oregon Model: intervention effects on maternal practice and child behavior in ethnic minority families
	Mamen, Asgeir	Aspects of using physical training in patients with substance dependence and additional mental distress
	Espevik, Roar	Expert teams: Do shared mental models of team members make a difference
	Haara, Frode Olav	Unveiling teachers' reasons for choosing practical activities in mathematics teaching
<b>2011</b>		
<b>H</b>	Hauge, Hans Abraham	How can employee empowerment be made conducive to both employee health and organisation performance? An empirical investigation of a tailor-made approach to organisation learning in a municipal public service organisation.
	Melkevik, Ole Rogstad	Screen-based sedentary behaviours: pastimes for the poor, inactive and overweight? A cross-national survey of children and adolescents in 39 countries.
	Vøllestad, Jon	Mindfulness-based treatment for anxiety disorders. A quantitative review of the evidence, results from a randomized controlled trial, and a qualitative exploration of patient experiences.
	Tolo, Astrid	Hvordan blir lærerkompetanse konstruert? En kvalitativ studie av PPU-studenters kunnskapsutvikling.
	Saus, Evelyn-Rose	Training effectiveness: Situation awareness training in simulators
	Nordgreen, Tine	Internet-based self-help for social anxiety disorder and panic disorder. Factors associated with effect and use of self-help.
	Munkvold, Linda Helen	Oppositional Defiant Disorder: Informant discrepancies, gender differences, co-occurring mental health problems and neurocognitive function.
	Christiansen, Øivin	Når barn plasseres utenfor hjemmet: beslutninger, forløp og relasjoner. Under barnevernets (ved)tak.
	Brunborg, Geir Scott	Conditionability and Reinforcement Sensitivity in Gambling Behaviour
	Hystad, Sigurd William	Measuring Psychological Resiliency: Validation of an Adapted Norwegian Hardiness Scale
<b>2012</b>		
<b>V</b>	Roness, Dag	Hvorfor bli lærer? Motivasjon for utdanning og utøving.
	Fjermestad, Krister Westlye	The therapeutic alliance in cognitive behavioural therapy for youth anxiety disorders
	Jenssen, Eirik Sørnes	Tilpasset opplæring i norsk skole: politikers, skolelederes og læreres handlingsvalg
	Saksvik-Lehouillier, Ingvild	Shift work tolerance and adaptation to shift work among offshore workers and nurses

	Johansen, Venke Frederike	Når det intime blir offentlig. Om kvinners åpenhet om brystkreft og om markedsføring av brystkreftsaken.
	Herheim, Rune	Pupils collaborating in pairs at a computer in mathematics learning: investigating verbal communication patterns and qualities
	Vie, Tina Løkke	Cognitive appraisal, emotions and subjective health complaints among victims of workplace bullying: A stress-theoretical approach
	Jones, Lise Øen	Effects of reading skills, spelling skills and accompanying efficacy beliefs on participation in education. A study in Norwegian prisons.
<b>2012</b>		
<b>H</b>	Danielsen, Yngvild Sørebo	Childhood obesity – characteristics and treatment. Psychological perspectives.
	Horverak, Jøri Gytre	Sense or sensibility in hiring processes. Interviewee and interviewer characteristics as antecedents of immigrant applicants' employment probabilities. An experimental approach.
	Jøsendal, Ola	Development and evaluation of BE smokeFREE, a school-based smoking prevention program
	Osnes, Berge	Temporal and Posterior Frontal Involvement in Auditory Speech Perception
	Drageset, Sigrunn	Psychological distress, coping and social support in the diagnostic and preoperative phase of breast cancer
	Aasland, Merethe Schanke	Destructive leadership: Conceptualization, measurement, prevalence and outcomes
	Bakibinga, Pauline	The experience of job engagement and self-care among Ugandan nurses and midwives
	Skogen, Jens Christoffer	Foetal and early origins of old age health. Linkage between birth records and the old age cohort of the Hordaland Health Study (HUSK)
	Leveresen, Ingrid	Adolescents' leisure activity participation and their life satisfaction: The role of demographic characteristics and psychological processes
	Hanss, Daniel	Explaining sustainable consumption: Findings from cross-sectional and intervention approaches
	Rød, Per Arne	Barn i klem mellom foreldrekonflikter og samfunnsmessig beskyttelse
<b>2013</b>		
<b>V</b>	Mentzoni, Rune Aune	Structural Characteristics in Gambling
	Knudsen, Ann Kristin	Long-term sickness absence and disability pension award as consequences of common mental disorders. Epidemiological studies using a population-based health survey and official ill health benefit registries.
	Strand, Mari	Emotional information processing in recurrent MDD

	Veseth, Marius	Recovery in bipolar disorder. A reflexive-collaborative exploration of the lived experiences of healing and growth when battling a severe mental illness
	Mæland, Silje	Sick leave for patients with severe subjective health complaints. Challenges in general practice.
	Mjaaland, Thera	At the frontiers of change? Women and girls' pursuit of education in north-western Tigray, Ethiopia
	Odéen, Magnus	Coping at work. The role of knowledge and coping expectancies in health and sick leave.
	Hynninen, Kia Minna Johanna	Anxiety, depression and sleep disturbance in chronic obstructive pulmonary disease (COPD). Associations, prevalence and effect of psychological treatment.
	Flo, Elisabeth	Sleep and health in shift working nurses
	Aasen, Elin Margrethe	From paternalism to patient participation? The older patients undergoing hemodialysis, their next of kin and the nurses: a discursive perspective on perception of patient participation in dialysis units
	Ekorås, Belinda	Emotional and Behavioural Problems in Children: Self-perception, peer relationships, and motor abilities
	Corbin, J. Hope	North-South Partnerships for Health: Key Factors for Partnership Success from the Perspective of the KIWAKKUKI
	Birkeland, Marianne Skogbrott	Development of global self-esteem: The transition from adolescence to adulthood
<b>2013</b>	Gianella-Malca, Camila	Challenges in Implementing the Colombian Constitutional Court's Health-Care System Ruling of 2008
<b>H</b>	Hovland, Anders	Panic disorder – Treatment outcomes and psychophysiological concomitants
	Mortensen, Øystein	The transition to parenthood – Couple relationships put to the test
	Årdal, Guro	Major Depressive Disorder – a Ten Year Follow-up Study. Inhibition, Information Processing and Health Related Quality of Life
	Johansen, Rino Bandlitz	The impact of military identity on performance in the Norwegian armed forces
	Bøe, Tormod	Socioeconomic Status and Mental Health in Children and Adolescents
<b>2014</b>	Nordmo, Ivar	Gjennom nåløyet – studenters læringserfaringer i psykologutdanningen
<b>V</b>	Dovran, Anders	Childhood Trauma and Mental Health Problems in Adult Life
	Hegelstad, Wenche ten Velden	Early Detection and Intervention in Psychosis: A Long-Term Perspective
	Urheim, Ragnar	Forståelse av pasientagresjon og forklaringer på nedgang i voldsrate ved Regional sikkerhetsavdeling, Sandviken sykehus

	Kinn, Liv Grethe	Round-Trips to Work. Qualitative studies of how persons with severe mental illness experience work integration.
	Rød, Anne Marie Kinn	Consequences of social defeat stress for behaviour and sleep. Short-term and long-term assessments in rats.
	Nygård, Merethe	Schizophrenia – Cognitive Function, Brain Abnormalities, and Cannabis Use
	Tjora, Tore	Smoking from adolescence through adulthood: the role of family, friends, depression and socioeconomic status. Predictors of smoking from age 13 to 30 in the “The Norwegian Longitudinal Health Behaviour Study” (NLHB)
	Vangsnes, Vigdis	The Dramaturgy and Didactics of Computer Gaming. A Study of a Medium in the Educational Context of Kindergartens.
	Nordahl, Kristin Berg	Early Father-Child Interaction in a Father-Friendly Context: Gender Differences, Child Outcomes, and Protective Factors related to Fathers’ Parenting Behaviors with One-year-olds
<b>2014</b>	Sandvik, Asle Makoto	Psychopathy – the heterogeneity of the construct
<b>H</b>	Skotheim, Siv	Maternal emotional distress and early mother-infant interaction: Psychological, social and nutritional contributions
	Halleland, Helene Barone	Executive Functioning in adult Attention Deficit Hyperactivity Disorder (ADHD). From basic mechanisms to functional outcome.
	Halvorsen, Kirsti Vindal	Partnerskap i lærerutdanning, sett fra et økologisk perspektiv
	Solbue, Vibeke	Dialogen som visker ut kategorier. En studie av hvilke erfaringer innvandererungdommer og norskfødte med innvanderforeldre har med videregående skole. Hva forteller ungdommenes erfaringer om videregående skoles håndtering av etniske ulikheter?
	Kvalevaag, Anne Lise	Fathers’ mental health and child development. The predictive value of fathers’ psychological distress during pregnancy for the social, emotional and behavioural development of their children
	Sandal, Ann Karin	Ungdom og utdanningsval. Om elevar sine opplevingar av val og overgangsprosessar.
	Haug, Thomas	Predictors and moderators of treatment outcome from high- and low-intensity cognitive behavioral therapy for anxiety disorders. Association between patient and process factors, and the outcome from guided self-help, stepped care, and face-to-face cognitive behavioral therapy.
	Sjølie, Hege	Experiences of Members of a Crisis Resolution Home Treatment Team. Personal history, professional role and emotional support in a CRHT team.
	Falkenberg, Liv Eggset	Neuronal underpinnings of healthy and dysfunctional cognitive control

	Mrdalj, Jelena	The early life condition. Importance for sleep, circadian rhythmicity, behaviour and response to later life challenges
	Hesjedal, Elisabeth	Tverrprofjonelt samarbeid mellom skule og barnevern: Kva kan støtte utsette barn og unge?
<b>2015 V</b>	Hauken, May Aasebø	« <i>The cancer treatment was only half the work!</i> » A Mixed-Method Study of Rehabilitation among Young Adult Cancer Survivors
	Ryland, Hilde Katrin	Social functioning and mental health in children: the influence of chronic illness and intellectual function
	Rønsen, Anne Kristin	Vurdering som profesjonskompetanse. Refleksjonsbasert utvikling av læreres kompetanse i formativ vurdering
	Hoff, Helge Andreas	Thinking about Symptoms of Psychopathy in Norway: Content Validation of the Comprehensive Assessment of Psychopathic Personality (CAPP) Model in a Norwegian Setting
	Schmid, Marit Therese	Executive Functioning in recurrent- and first episode Major Depressive Disorder. Longitudinal studies
	Sand, Liv	Body Image Distortion and Eating Disturbances in Children and Adolescents
	Matanda, Dennis Juma	Child physical growth and care practices in Kenya: Evidence from Demographic and Health Surveys
	Amugsi, Dickson Abanimi	Child care practices, resources for care, and nutritional outcomes in Ghana: Findings from Demographic and Health Surveys
	Jakobsen, Hilde	The good beating: Social norms supporting men's partner violence in Tanzania
	Sagoe, Dominic	Nonmedical anabolic-androgenic steroid use: Prevalence, attitudes, and social perception
	Eide, Helene Marie Kjærgård	Narrating the relationship between leadership and learning outcomes. A study of public narratives in the Norwegian educational sector.
<b>2015 H</b>	Wubs, Annegreet Gera	Intimate partner violence among adolescents in South Africa and Tanzania
	Hjelmervik, Helene Susanne	Sex and sex-hormonal effects on brain organization of fronto-parietal networks
	Dahl, Berit Misund	The meaning of professional identity in public health nursing
	Røykenes, Kari	Testangst hos sykepleierstudenter: «Alternativ behandling»
	Bless, Josef Johann	The smartphone as a research tool in psychology. Assessment of language lateralization and training of auditory attention.
	Løvvik, Camilla Margrethe Sigvaldsen	Common mental disorders and work participation – the role of return-to-work expectations



	Lehmann, Stine	Mental Disorders in Foster Children: A Study of Prevalence, Comorbidity, and Risk Factors
	Knapstad, Marit	Psychological factors in long-term sickness absence: the role of shame and social support. Epidemiological studies based on the Health Assets Project.
<b>2016</b>	Kvestad, Ingrid	Biological risks and neurodevelopment in young North Indian children
<b>V</b>	Sælør, Knut Tore	Hinderløyper, halmstrå og hengende snører. En kvalitativ studie av håp innenfor psykisk helse- og rusfeltet.
	Mellingen, Sonja	Alkoholbruk, partilfredshet og samlivsstatus. Før, inn i, og etter svangerskapet – korrelater eller konsekvenser?