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Predictors and moderators of Internet-based cognitive behavior therapy for obsessive–compulsive disorder: Results from a randomized trial

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ABSTRACT

Internet-based cognitive behavior therapy (ICBT) for obsessive–compulsive disorder (OCD) has shown efficacy in randomized trials but many patients do not respond to the treatment, we therefore need to find predictors and moderators of treatment response. In this study, we analyzed predictors of ICBT response using both post-treatment as well as 24-month outcome data. As half of the participants were randomized to receive an Internet-based booster program as an adjunct to ICBT, we also investigated moderators of ICBT with or without booster. Results showed that more severe baseline OCD symptoms predicted worse end state outcome but also higher degree of change. Furthermore, high degree of working alliance predicted better outcome but patients with primary disgust emotions had worse treatment effects. The moderator analysis also indicated that scoring high on the obsessing subscale on the Obsessive–Compulsive Inventory-Revised predicted worse treatment outcome in the booster group. In conclusion, there are some possible predictors and moderators of ICBT for OCD but more research is needed with larger and clinically representative samples.

1. Introduction

Obsessive–compulsive disorder (OCD) is a common and debilitating condition (Kessler, Chiu, Demler, Merikangas, & Walters, 2005; Weissman et al., 1994) with low spontaneous remission rate (Mataix-Cols et al., 2002; Skoog & Skoog, 1999). The most well-established psychological treatment is cognitive behavior therapy (CBT), with responder rates averaging 50–60% (Fisher & Wells, 2005) and sustained long-term effects (Whittal, Robichaud, Thordarson, & McLean, 2008). CBT can be delivered both in individual- and group format (Fisher & Wells, 2005). A recent innovation is Internet-based CBT with therapist support (ICBT), where all therapist contact is provided using interactive online platforms (Andersson, 2009). Our research group has previously tested ICBT for OCD in an open pilot study (Andersson et al., 2011) and in a randomized controlled trial (Andersson et al., 2012a), with responder rates similar to conventional CBT (60–61%). These findings correspond well with the effects found in two Australian trials of ICBT for OCD (Wootton et al., 2011; Wootton, Dear, Johnston, Terides, & Titov, 2013). In a recent study, we reused the sample from the Andersson et al. (2012a) trial and randomized half the participants to also receive an Internet-based booster program as an adjunct to ICBT. Results showed that both groups had sustained long-term effects up to two years after receiving ICBT, but participants randomized to ICBT with booster had a slower relapse rate compared to ICBT without booster (Andersson et al., 2014).

Although research has shown that both individual-, group- and Internet-based CBT are effective treatments for OCD, a significant proportion of the patients do not get an adequate treatment response and the full recovery rate of CBT has been estimated to be only about 25% (Fisher & Wells, 2005). One possible way to reduce the non-responder rates is to investigate predictors and moderators of treatment response. A predictor in a randomized controlled trial (RCT) is a pre- or post-treatment variable that has a main effect on outcome but shows no interactive effect with the treatment condition. A moderator has the same characteristic as a predictor but with the difference that it shows an interactive between-group effect on outcome. For instance, if pre-treatment

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depressive symptoms were found to be associated with worse outcome for both CBT and psychodynamic therapy, it would be a predictor. But if it were to be shown that pre-treatment depression only affected the outcome for patients going through the CBT, it would be a moderator. Thus, research on predictors and moderators are important because they can provide the clinician with information for whom the chosen treatment works for, thereby reduce treatment failures and also help to develop individually tailored treatments (Kazdin, 2007; Kraemer, Wilson, Fairburn, & Agras, 2002). There are, to our knowledge, no published studies that have investigated predictors or moderators of ICBT for OCD. This study therefore set out to investigate this issue.

We used outcome data from a previously conducted randomized trial of ICBT with a long-term follow-up data, where 101 patients received ICBT for 10 weeks and were then assessed at post-treatment and at 24-month follow-up (Andersson et al., 2012a; Andersson et al., 2014). As patients presenting with hoarding- and sexual/religious obsessions have been shown to have worse treatment response in previous studies (Jaurrieta et al., 2008; Keeley, Storch, Merlo, & Geffken, 2008; Knopp, Knowles, Bee, Lovell, & Bower, 2013), our first hypothesis was that this would also be the case in ICBT. Another clinical variable that has been shown to be important in CBT for OCD is pre-treatment symptom levels (Keeley et al., 2008). Our second hypothesis was therefore that higher pre-treatment OCD symptoms would be indicative of worse treatment response. Furthermore, an interesting process variable that has been shown to be important in the treatment of OCD is the therapeutic alliance (Keeley et al., 2008; Vogel, Hansen, Stiles, & Götestam, 2006), and this variable has also been shown to be associated with adherence which, in turn, is associated with better treatment response (Simpson et al., 2011). Our third hypothesis was therefore that higher degree of working alliance would predict better treatment response also in ICBT for OCD. Another process variable that may interact with treatment outcome is the role of emotions. An example of this is McKay (2006) who showed that OCD patients with self-reported disgust in relation to specific obsessions do not respond as quickly to ERP as patients with other self-reported primary emotions (e.g. fear). We therefore wanted to investigate if this process variable mattered also in a large-scale sample, and our fourth and last hypothesis was that patients with primary disgust emotions would show worse treatment response.

2. Methods

2.1. Trial design and sample participants

This study used data from two different published trials (Andersson et al., 2012a, 2014), which were both approved by the regional ethics review board in Stockholm, Sweden (clinicaltrials.gov, registration ID: NCT01347099 and NCT01525576).

In the first study (Andersson et al., 2012a), 101 participants were randomized to either 10 weeks of ICBT or to a control condition. Participation in this trial was open for adults with OCD, according to the DSM-V-TR (American Psychiatric Association, 2000). Concurrent medications were permitted if the participant had been on a stable dose for at least two months and aggreed to continue on stable dose throughout the treatment period. Participants with serious comorbid problems such as current drug or alcohol abuse, history of psychosis or bipolar disorder, serious physical illness, suicidal ideation were excluded. Other exclusion criteria were extreme- or minimal OCD severity (i.e. more than 31 or less than 12 on the Yale-Brown Obsessive–Compulsive Scale; Y-BOCS; Goodman et al., 1989) and symptoms primary related to hoarding. The inclusion/exclusion assessments were conducted via telephone by licensed psychologists or senior clinical psychology students. All cases were reviewed by a psychiatrist and a licensed psychologist before decision on inclusion/exclusion. Results showed that the ICBT group made substantial improvements compared to control condition (between group effect size; $d=1.12$). The control condition did not make any major changes (6% responders) and was crossed over to ICBT after 10 weeks. More detailed information and inclusion characteristics of this sample are described in the main outcome study (Andersson et al., 2012a). Patient demographics are displayed in Table 1.

Table 1
Patient characteristics.

Variable	ICBT ($n=101$)	Booster ($n=47$)	No booster ($n=46$)
Gender			
Men/Women	34/67	16/31	16/30
Age			
Mean (SD)	34.93 (12.72)	36.39 (11.18)	37.32 (14.36)
Min–Max	18–68	22–63	20–70
Years with OCD symptoms			
Mean (SD)	18.12 (12.58)	18.30 (10.57)	18.00 (14.33)
Min–Max	1–55	1–52	2–55
Age of onset			
Mean (SD)	16.81 (8.99)	16.21 (7.33)	17.63 (10.48)
Min–Max	6–60	6–36	6–60
Y-BOCS pre mean (SD)	21.11 (4.31)	20.74 (4.37)	21.17 (4.29)
Y-BOCS post mean (SD)	12.66 (5.85)	12.37 (5.58)	12.42 (5.79)
Y-BOCS 24-months mean (SD)	10.65 (5.69)	10.72 (5.93)	10.59 (5.51)
Qualitative data on emotions			
Fear (n)	12	8	4
Anxiety/worry (n)	74	36	37
Disgust (n)	19	8	9
Not-just-right (n)	15	6	7
Guilt/shame (n)	10	4	6
WAI (SD)	65.71 (12.83)	67.49 (12.02)	65.78 (12.28)

Abbreviations: Y-BOCS, Yale-Brown Obsessive–Compulsive scale; WAI, Working Alliance Inventory.

In the second study (Andersson et al., 2014), we wanted to investigate the long-term efficacy of ICBT using the pooled sample. Consequently, this study comprised two cohorts of participants, where the first cohort received ICBT directly and cohort 2 received ICBT after 10 weeks as a control condition. There were no significant differences between the two groups regarding baseline severity of OCD symptoms, demographic characteristics and in improvement rates after completed ICBT. Long-term follow-up was conducted at 4-, 7-, 12- and 24-month follow-up but half of the participants were also randomly allocated to a brief booster program between 4- and 7-month follow-up. Data loss on the primary outcome was low (12% at 7-months and 6% at 12- and 24-months) and results showed a significant interaction effect on the Y-BOCS, favoring the booster group at 7-months but this difference disappeared at 12- and 24-months. Secondary measures found interaction effects favoring the booster group on the Obsessive–Compulsive Inventory-Revised (OCI-R; Foa et al., 2002) at 24-months, and also on the Global Assessment of Functioning (American Psychiatric Association, 2000) at 7-, 12- and 24-months. Kaplan–Meier analysis also revealed a significantly slower relapse rate for the booster group. Detailed information of the two treatment groups is displayed in Table 1 and the summarizing flowchart from the two studies is displayed in Fig. 1.

In the present predictor and moderator study, we first wanted to explore predictors of immediate treatment response of ICBT, and therefore used pooled data from the 96 participants who completed the assessments at post-treatment. Second, we wanted to investigate long-term outcome, and therefore used the 24-month follow-up assessment data ($n=87$), and repeated the predictor analyses (4-, 7- and 12-month data were not included in this study). Third, as the 24-month follow-up data consisted of two different treatment groups (ICBT+booster vs. ICBT without booster), we wanted to see if there were any interaction effects between predictors and treatment allocation on the outcome (i.e. moderators).

2.2. Treatment

2.2.1. ICBT

All participants received 10 weeks of ICBT for OCD. The treatment consisted of 10 different text modules (i.e. web-based book chapters also available as mp3-files), which was based on standard CBT components including psychoeducation, cognitive restructuring and exposure with response prevention (ERP). Participants interacted with an online therapist through an integrated text messaging function on the encrypted web site, where they were given feedback on homework assignments, granted consecutive access to the treatment modules, and received support in doing ERP. The therapists worked proactively and contacted the participant 2–3 times per week to follow up treatment progression. An SMS was automatically sent to the participant to notify about new emails from the therapist. If the participant had not logged on for at least a week, the therapists called the participant (by telephone) to check status and remind him/her to login as soon as possible. The therapists were clinical psychology students in their final year of the