Journal of Anxiety Disorders 68 (2019) 102153

Contents lists available at ScienceDirect

Journal of Anxiety Disorders

journal homepage: www.elsevier.com/locate/janxdis

Predictors of treatment outcome in OCD: An interpersonal perspective

Lee Tibi[a,*], Patricia van Oppen[b], Anton J.L.M. van Balkom[b], Merijn Eikelenboom[b], Paul M.G. Emmelkamp[c], Gideon E. Anholt[a]

[a] Department of Psychology, Ben-Gurion University of the Negev, Beer-Sheva, Israel
[b] Department of Psychiatry and the Amsterdam Public Health Research Institute, VU University Medical Center, GGZ InGeest, Amsterdam, the Netherlands
[c] Department of Clinical Psychology, University of Amsterdam, Amsterdam, the Netherlands

ARTICLE INFO

Keywords:
Obsessive compulsive disorder
Predictors
Attachment style
Longitudinal
Exposure and response prevention

ABSTRACT

Although effective treatments for obsessive compulsive disorder (OCD) are increasingly available, a considerable percentage of patients fails to respond or relapses. Predictors associated with improved outcome of OCD were identified. However, information on interpersonal determinants is lacking. This study investigated the contribution of attachment style and expressed emotion to the outcome of exposure and response prevention (ERP), while accounting for previously documented intrapersonal (i.e., symptom severity and personality pathology) predictors. Using logistic regression analyses and multi-level modeling, we examined predictors of treatment completion and outcome among 118 adult OCD patients who entered ERP. We assessed outcome at post treatment, and at four and 13 months from treatment completion. OCD baseline severity and fearful attachment style emerged as the main moderators of treatment outcome. Severe and fearfully attached patients were more likely to dropout prematurely. The improvement of fearful clients was attenuated throughout treatment and follow-up compared to non-fearful clients. However, their symptom worsening at the long-term was also mitigated. Severe OCD patients had a more rapid symptom reduction during treatment and at follow-up, compared to less severe clients. The findings suggest that both baseline OCD severity and fearful attachment style play a role in the long-term outcome of ERP.

1. Introduction

Obsessive-compulsive disorder (OCD) is a prevalent and incapacitating psychiatric condition, which compromises an individual's functioning and well-being (Eisen et al., 2006; Subramaniam, Soh, Vaingankar, Picco, & Chong, 2013). Cognitive-behavior therapy with exposure and response prevention (ERP) is currently the first line psychological treatment for OCD, associated with moderate to large effect sizes in symptoms reduction (Knopp, Knowles, Bee, Lovell, & Bower, 2013; Öst, Havnen, Hansen, & Kvale, 2015; Rosa-Alcázar, Sánchez-Meca, Gómez-Conesa, & Marín-Martínez, 2008). However, a significant percentage of patients exhibit non-or partial response, so despite the established effectiveness of ERP, additional effort is needed to further improve its outcome (Abramowitz, 2006; Fisher & Wells, 2005; McKay et al., 2015; Simpson et al., 2008; Whittal & McLean, 1999).

A central issue in treatment outcome is the durability of the therapeutic effect. Several studies suggested that the positive outcome of ERP was sustained at follow-up (Belloch, Cabedo, & Carrió, 2008; Rosqvist et al., 2001; Skapinakis et al., 2016; Whittal, Robichaud, Thordarson, & McLean, 2008). Nonetheless, despite the evident improvement, patients continue to experience symptoms within the clinical range at the long-term (Tolin et al., 2007). For example, a two-year follow-up study that examined gain maintenance following psychological treatment for OCD demonstrated that only half of the patients maintained recovery status at follow-up (Whittal et al., 2008). DiMauro, Domingues, Fernandez, and Tolin (2013) reported three benchmarking studies with a long-term (i.e., one year) follow-up of treatment for OCD. They demonstrated that patients who responded to treatment sustained improvement throughout the follow-up period. Nonetheless, in these studies, 80% of the patients considered as responders, were not considered as remitters (DiMauro et al., 2013). Finally, a randomized controlled trial that assessed the five-year follow-up effect of exposure therapy found that alongside the significant improvement from baseline and large effect sizes, patients still experienced clinically significant symptoms at follow-up (van Oppen, van Balkom, De Haan, & van Dyck, 2005). Therefore, it appears that OCD might run a chronic course even despite effective treatment (Kempe et al., 2007).

* Corresponding author.
E-mail address: tibi@post.bgu.ac.il (L. Tibi).

https://doi.org/10.1016/j.janxdis.2019.102153
Received 7 June 2019; Received in revised form 2 September 2019; Accepted 13 October 2019
Available online 24 October 2019

Given the limited effect of psychotherapy in OCD, a growing interest in predictors and moderators of outcome of a mental illness was presented by National Institutes of Mental Health (Insel, 2009). Identification of treatment predictors is paramount to the improvement of ERP through precision medicine, which corresponds to using the client's characteristics to tailor treatment (Schneider, Arch, & Wolitzky-Taylor, 2015). Identified predictors of poor treatment outcome include increased pretreatment OCD and depressive severity, the presence of a personality disorder and hoarding (Brennan et al., 2014; Diefenbach, Wootton, Bragdon, Moshier, & Tolin, 2015; Keeley, Storch, Merlo, & Geffken, 2008; Knopp et al., 2013; Sharma, Thennarasu, & Reddy, 2014; Steketee et al., 2011).

Prediction research in OCD focused mainly on intrapersonal predictors of treatment outcome (i.e., within the individual: severity, age of onset), and largely omitted interpersonal factors (i.e. between the individual and the environment: social support, attachment style). Nonetheless, certain interpersonal factors were associated with severity of OCD (Doron et al., 2012; Thiel et al., 2014) and addressing interpersonal conflicts in therapy improved the outcome ERP for OCD (2013, Abramowitz et al., 2012). In addition, several studies found that OCD patients who held dysfunctional schemas such as fear of abandonment demonstrated poorer treatment response (Haaland et al., 2011; Thiel et al., 2014; Wilhelm, Berman, Keshaviah, Schwartz, & Steketee, 2015).

Interpersonal factors might be involved not only in treatment outcome, but also in the likelihood that the patient will complete treatment (Zilcha-Mano et al., 2016). For example, maladaptive interpersonal characteristics predicted dropout from the treatment of depression (Zilcha-Mano et al., 2016). Attrition in psychotherapy has potential adverse effects such as reduced treatment efficacy and biased interpretation of treatment results, as completers may not fully represent the treatment seeking population (Ogrodniczuk, Joyce, & Piper, 2005). In OCD, attrition is not uncommon as approximately 15% of the patients entering ERP do not complete treatment (Ong, Clyde, Bluett, Levin, & Twohig, 2016). Higher pre-treatment depression severity was found to predict early dropout from treatment for OCD (Aderka et al., 2011). There is mixed evidence regarding the predictive effect of OCD symptom severity on dropout, as lower perceived OCD symptom severity score was associated with dropout from treatment (Hansen, Hoogduin, Schaap, & Dehaan, 1992; Steketee et al., 2011). However, this effect was not replicated in a clinician-rated assessment of OCD (Steketee et al., 2011). The relationship between interpersonal characteristics and treatment dropout has yet to be examined in the context of OCD.

An interpersonal factor that might be related to the completion and outcome of ERP is adult attachment style, which corresponds to the way people view themselves and others in relationships (Bowlby, 1980). According to Bowlby's theory the attachment system is activated in times of distress, and attachment style in adulthood is rooted in the individual's self-perception as worthy and others as available and supportive (Bowlby, 1980; Hazan & Shaver, 1987). Differences in attachment style mirror emotion regulation and coping with distress (Bowlby, 1980). Insecure or anxious-avoidant individuals tend to experience negative emotions and to cope poorly with distress, as opposed to securely attached persons, that are mostly effective with regulating affect (Griffin & Bartholomew, 1994).

Surprisingly, there is limited research on the prediction effect of attachment style on psychotherapy dropout. However, the presence of a personality disorder, which is closely linked to insecure attachment style (Nakash-Eisikovits, Dutra, & Westen, 2002), was found to increase dropout from psychotherapy (Swift & Greenberg, 2012). In a medical context, dismissing-avoidant attachment style was associated with poor patient-provider relationship and impaired treatment adherence among clients with diabetes (Ciechanowski, Katon, Russo, & Walker, 2001). It is likely that one's interpersonal style would be associated with one's ability to fully attend and to persist with treatment. Perhaps patients who struggle to collaborate with health care professionals, tend to dropout prematurely from treatment.

A series of studies suggested that insecure attachment was related to OCD cognitions and symptoms (Doron & Kyrios, 2005; Doron, Moulding, Kyrios, Nedeljkovic, & Mikulincer, 2009, 2012). Nonetheless, these studies were cross-sectional and whether attachment style affects treatment outcome in OCD remains unclear. A recent meta-analysis suggested that securely attached patients demonstrated better outcome in psychotherapy as compared to insecurely attached individuals (Levy, Kivity, Johnson, & Gooch, 2018). It is possible that patients with a secure style develop stronger therapeutic alliances (Smith, Msetfi, & Golding, 2010), an established facilitator of outcome (Martin, Garske, & Davis, 2000).

Empirical data suggests that the outcome of OCD is also related to the interactions between patients and their families (Abramowitz et al., 2012; Cherian, Math, Kandavel, & Reddy, 2014; Cherian, Pandian, Bada Math, Kandavel, & Janardhan Reddy, 2014; Renshaw, Steketee, Rodrigues, & Caska, 2010). Typically, responses of significant others to OCD symptoms fall on a continuum from accommodating to antagonistic (Grunes, Neziroglu, & McKay, 2001). Surprisingly, little research has been devoted to the effect of antagonistic behaviors on treatment outcome (Remmerswaal, Batelaan, Smit, Van Oppen, & Van Balkom, 2016). Expressed emotion (EE), corresponds to hostility and criticism displayed by family members towards a patient with psychological difficulties (Hooley & Gotlib, 2000). Perceived negative emotionality was found to be associated with psychopathology symptoms and with relapse in depressed patients (Hooley & Teasdale, 1989). In OCD, EE was suggested to act as a stressor that may increase symptom severity (Pace, Thwaites, & Freeston, 2011; Renshaw, Chambless, & Steketee, 2003). A naturalistic study of OCD patients found that non-remitters reported increased perceived EE at baseline (Cherian, Math et al., 2014, Cherian, Pandian et al., 2014). EE also predicted dropout from ERP (Chambless & Steketee, 1999).

In the present study we aimed at extending prediction research by examining attachment style and EE as predictors of the completion and outcome of ERP, administered to adult OCD patients in a randomized controlled trial (Van Balkom et al., 2012; Van Oppen et al., 2010). We also examined the effect of personality pathology, OCD and depressive severity, that were previously associated with poor outcome in OCD (Keeley et al., 2008; Knopp et al., 2013). Given that outcome research in OCD is limited by short follow-up periods (Olatunji et al., 2013), we sought to examine the long-lasting effect of ERP and to investigate predictors of outcome after treatment completion. We addressed the following research questions: Do clinical and interpersonal determinants predict (1) pre-termination dropout from ERP?, (2) the likelihood to respond to ERP?, (3) the long-term outcome of ERP?

We hypothesized that increased baseline depression severity, personality pathology, insecure attachment style and increased EE would predict dropout from ERP. In addition, consistent with previous findings, we expected that increased OCD symptom severity as assessed by a clinician rated scale would be associated with increased likelihood to dropout (Steketee et al., 2011). Such an association might be related to poorer functioning and less resources to adhere with treatment demands (Steketee et al., 2011). Secondly, we hypothesized that increased baseline symptom severity, personality pathology, insecure attachment style and increased EE would predict poorer response to ERP and a less favorable long-term outcome.

2. Method

2.1. Participants and procedure

A total of 118 adult patients (aged 17–80) enrolled in the original treatment study (Van Oppen et al., 2010). The study was conducted at the academic outpatient clinic of a mental health institute specializing in anxiety disorders, between January 1999 and January 2005. The

participants were recruited from referrals by general practitioners and mental health agencies. The primary eligibility criteria was a minimum age of 17 and at least a one-year duration of an OCD diagnosis obtained using the Structured Clinical Interview on DSM-IV axis I diagnoses (First, Spitzer, Gibbon, & Williams, 1999). Exclusion criteria included patients with obsessions only, suicidal intent, organic brain disease, past or present psychosis, psychoactive substance use disorder or severe borderline or antisocial personality disorders.

The aim of the original study was to compare the effectiveness of four modes of ERP: (i) therapist-controlled ERP performed by experienced behavior therapists; (ii) therapist-controlled ERP performed by graduate students in clinical psychology; (iii) self-controlled ERP performed by experienced behavior therapists, and (iv) self-controlled ERP performed by graduate students in clinical psychology. Admitted patients demonstrated moderate to severe levels of OCD symptoms at pretreatment, as measured by the clinician rated Yale-Brown Obsessive Compulsive Scale (Y-BOCS; Goodman, Price, Rasmussen, Mazure, Delgado et al., 1989). A detailed description of the sample is found elsewhere (Van Oppen et al., 2010). Briefly, all the experienced behavioral therapists had a master's degree in clinical psychology and were certified cognitive behavioral therapists. During the study, they were certified as behavior therapy supervisors by the National Association of Behavior Therapy and Cognitive Therapy in the Netherlands. The inexperienced therapists were all students in the final year of their master's degree in clinical psychology. The students were trained in a 2-day ERP workshop prior to the study and were allowed to participate as therapists for a maximum of one year.

Seventeen patients were classified as non-completers, since they dropped-out before completing a minimum of eight sessions of ERP, resulting in 101 participants who completed treatment and consisted of the sample in the prediction analyses. The mean number of sessions for treatment completers was 11.62 (*SD* = .99, *range*: 8–12). Standardized treatment protocols were used for all treatment conditions. All treatments consisted of 12 weekly sessions except when both patient and the therapist agreed that full recovery was reached before session 12. A detailed description of the treatment conditions is found in Van Oppen et al. (2010). The results of the treatment study demonstrated a significant decrease in OCD severity with large effects sizes in all four conditions. Results remained stable both in intent-to-treat and in completer analyses (Van Oppen et al., 2010). Following treatment termination patients were contacted for two follow-up evaluations that took place at four months (*M* = 3.95, *SD* = 2.43, *range* = 1–13) and at 13 months (*M* = 13.16, *SD* = 5.26, *range* = 4–37) from treatment termination. Patients who did not respond to ERP were subsequently referred to a second-step treatment consisting of cognitive or pharmacological therapy (see Van Balkom et al., 2012). Response in this study was defined as an improvement equal to or greater than one-third (33.3%) in the Y-BOCS (Van Balkom et al., 2012).

Pretreatment assessments included administration of both severity measures as well as measures of interpersonal functioning and personality pathology (see below). Post-treatment and follow-up assessments included OCD severity assessment.

2.2. Measures

2.2.1. OCD symptoms

OCD symptom severity was assessed using the clinician rated version of the Y-BOCS. The Y-BOCS is regarded as the gold standard instrument for the measurement of OCD severity (Goodman, Price, Rasmussen, Mazure, Delgado et al., 1989, Goodman, Price, Rasmussen, Mazure, Fleischmann et al., 1989). This is a 10-item severity scale, with each item rated from 0 (no symptoms) to 4 (extreme symptoms). The Y-BOCS severity scale has well documented validity and reliability (Goodman, Price, Rasmussen, Mazure, Delgado et al., 1989, Goodman, Price, Rasmussen, Mazure, Fleischmann et al., 1989).

2.2.2. Responder status

In addition to the 33.3% reduction in the Y-BOCS score from pre-to-post treatment, we categorized ERP responders according to the clinical significant change criterion that was previously validated in the literature (Diefenbach et al., 2015; Simpson, Huppert, Petkova, Foa, & Liebowitz, 2006). In line with guidelines provided by Jacobson and Truax (Jacobson & Truax, 1991), we established double criteria for clinical significant change according to which (a) the change reported following treatment is reliable (a decrease of 5 points or more in the Y-BOCS) and subsequently (b) the patient is likely to be within the non-clinical range (i.e. Y-BOCS $\leq$13; Diefenbach et al., 2015; Gilliam, Diefenbach, Whiting, & Tolin, 2010; Tolin, Abramowitz, & Diefenbach, 2005).

2.2.3. Depressive symptoms

Depressive symptom severity was assessed using the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The BDI is a 21-item, widely used self-report inventory for measuring the severity of depression. The total scores of the BDI range from 0 to 63. The BDI demonstrated excellent reliability and validity (Beck & Steer, 1988).

2.2.4. Adult attachment style

We assessed adult attachment style via the Relationship questionnaire (RQ; Bartholomew & Horowitz, 1991), which is based on the four-category two-dimensional model of adult attachment. Four prototypic attachment patterns are defined, using combinations of a person's self-image (positive or negative) and image of others (positive or negative): Secure, preoccupied, dismissing and fearful. Specifically, the secure style indicates a sense of worthiness with an expectation that others would be responsive and accepting. The preoccupied style represents a sense of distress and unworthiness with the expectation that others would be supportive. This combination characterizes striving for self-acceptance, by gaining reassurance from others. The fearful style is associated with a negative view of both self and others, indicating a sense of unworthiness with an expectation that others would be rejecting. The dismissing style is associated with a generally positive view of the self, combined with a negative disposition towards others. Participants are asked to rate their degree of correspondence to each attachment prototype on a 7-point scale. The RQ yields four dimensional scores using single item measures made up of four short paragraphs, corresponding to the four attachment style prototypes. The RQ shows adequate reliability and evidence for convergent validity (Ravitz, Maunder, Hunter, Sthankiya, & Lancee, 2010).

2.2.5. Personality pathology

We used the Personality Diagnostic Questionnaire (PDQ-4+; Hyler, 1994)) to assess overall personality pathology. The PDQ-4+ is a self-report questionnaire with 99 true/false items that correspond to ten personality disorders (i.e., paranoid, schizotypal, schizoid, histrionic, narcissistic, borderline, antisocial, avoidant, dependent, and obsessive-compulsive). Using structured clinical interview as the criterion measure, the PDQ-4+ was found to have high sensitivity for the screening of personality disorder, however its' specificity was found to be moderate (Abdin et al., 2011). One of the limitations of the PDQ-4+ is its risk of false-positives in the diagnosis of a personality disorder (Fossati, Maffei, Bagnato, & Donati, 1998). Therefore, for the purpose of the current study we used the PDQ-4+ in its continuous form, to get a broad picture regarding the tendency to present with a personality pathology.

2.2.6. Expressed emotion

EE was assessed through the Level of Expressed Emotion inventory (LEE; Cole & Kazarian, 1988). The LEE is a 39 item self-report of perceived EE, in which patients were asked to evaluate their relationship with their closest relative (i.e., the relative with whom they live)

according to four factors that reflect EE: lack of emotional, intrusiveness, irritation, and criticism. Each item is scored on a scale from 1 to 4, as higher score indicated for increased perceived EE. The LEE was found to be valid and reliable instrument, reflective of EE theory and research (Hale, Raaijmakers, Gerlsma, & Meeus, 2007).

2.3. Data analyses

Although there were no significant differences across the four modes of ERP (Patricia Van Oppen et al., 2010), personality and interpersonal predictors might interact with the presence of a therapist in treatment (i.e. self-controlled vs. therapist controlled condition). Therefore we conducted analyses of covariance (ANCOVA) in order to assess interactions between the therapist presence and personality and interpersonal factors in predicting dropout and treatment response. No statistically significant interaction effect was found for between treatment condition and the predictors. In light of the findings of Van Oppen et al. (2010) and the results of the additional interaction analyses, we combined the data of the treatment groups for the current study analyses. For further description of the results of the treatment conditions see (Van Oppen et al., 2010). We examined predictors of dropout, post-treatment response and clinical significant change using multivariate logistic regression analyses. The results are reported using odds ratios (ORs) and their associated 95% confidence intervals (95%CIs). Clinical and interpersonal predictors were entered simultaneously to identify factors with a significant effect on response to ERP (i.e. $p < 0.05$).

In light of the nested nature of our follow-up data (measurements nested within participants) we used multi-level linear modeling (MLM) for the longitudinal analyses (Raudenbush & Bryk, 2002). The within-subject, time-varying dependent variable was the Y-BOCS severity scale measured at baseline and throughout the follow-up period. The between-subject moderators were the clinical and interpersonal variables measured at baseline. Since long-term treatment outcome might follow a non-linear trajectory, we estimated both the within-person linear and quadratic trajectories. To estimate changes in the Y-BOCS score at follow-up we first conducted a two-level model where the measurements (level 1) were nested within the participants (level 2). We conducted the analysis hierarchically, as we first examined the linear and quadratic trajectories of change during the follow-up period. Next, we assessed the effects of the between-subject candidate predictors. Finally, we sought to examine whether between-subject characteristics (i.e., clinical and interpersonal predictors) may explain the differences in the person specific trajectories. The predictors' two-way interactions terms with time were then entered in the multivariate model. Both completers and intent to treat analyses were carried out and the significance level was set at $p < .05$. All analyses were conducted using SPSS 21.0 (IBM).

3. Results

Table 1 presents baseline demographic, clinical and psycho-social characteristics of the 118 OCD patients who entered ERP.

3.1. Predictors of dropout

Seventeen patients (14.4%) dropped out before treatment completion. Dropouts completed approximately five ERP sessions ($M = 5.28$, $SD = 2.91$) as compared to 11 ($M = 11.62$, $SD = .98$) sessions of treatment completers. A logistic regression analysis demonstrated good fit to the data (Hosmer and Lemeshow test: $\chi^2 = 3.99$, $df = 8$, $p = .85$) and explained 28.6% of the variance (Nagelkerke $R^2 = 0.286$). Increased baseline OCD severity ($OR = 1.17$, 95%$CI = 1.00–1.37$, $p < .05$) and fearful attachment style ($OR = 1.70$, 95%$CI = 1.12–2.59$, $p < .05$) were significantly associated with greater likelihood to drop out before treatment completion.

Table 1
Demographic and psycho-social characteristics of participants at baseline (N = 118).

Variable	M (SD)/N (%)
Age	35.08 (10.71)
Female	71 (60.2)
Past treatment for mental disorders	86 (72.9)
Total Y-BOCS severity	26.25 (5.53)
Beck Depression Inventory	15.29 (9.54)
Level of Expressed Emotion	62.27 (16.35)
Personality Disorder Questainnaire	29.75 (13.95)
Attachment style	
Secure: I feel at ease in intimate relationship	4.38 (1.76)
Dismissing: I prefer that others are independent of me and I am independent of them	3.12 (1.94)
Preoccupied: I have the impression that usually I like others better than they like me	3.43 (1.86)
Fearfull: I am wary to get engaged in close relationships because i am afraid to get hurt	4.20 (2.03)

Note: Y-BOCS = Yale-Brown Obsessive Compulsive Scale.

3.2. Predictors of post-treatment response

Of the 101 participants who completed ERP, 62 (61.4%) patients were categorized as responders. The mean Y-BOCS post-treatment score of the responders was 10.35 ($SD = 5.03$) and the mean score of the non-responders group was 23.25 ($SD = 4.90$). Intent to treat and completers analyses yielded identical results in all the below-mentioned analyses. In the sections below, we present the findings from the completers sample. We examined the prediction effects of clinical and interpersonal determinants on treatment response. In this model, none of the candidate predictors was associated with treatment response.

3.3. Predictors of post-treatment clinical significant change

A total of 42 (41.5%) patients who underwent ERP exhibited a clinical significant change at post-treatment. The mean Y-BOCS score at post-treatment of the group who experienced clinical significant change was 7.81 ($SD = 3.72$) while the mean score of the group who did not experience such change was 20.69 ($SD = 5.57$). The logistic regression model aimed to examine predictors of post-treatment clinical significant change demonstrated a good fit to the data (Hosmer and Lemeshow test: $\chi^2 = 9.25$, $df = 8$, $p = .32$), with 20.7% of explained variance (Nagelkerke $R^2 = 0.207$). In this model, only baseline OCD severity predicted clinical significant change, as increased severity was associated with a reduced chance of experiencing clinical significant change following treatment ($OR = .86$, $95\%CI = .77–.97$, $p < .05$). The rest of the predictors were not associated with post-treatment clinical significant change.

3.4. Predictors of the long-term outcome

Table 2 presents the outcome of the Y-BOCS severity scale throughout the follow-up period, in terms of means, SD's and clinical significant change. We conducted additional analyses to examine differences between the self-and therapist-controlled group. Using t tests and cross tabulation analyses, we found no significant differences

Table 2
Response to ERP over 13 months follow-up according to the Yale-Brown Obsessive Compulsive Severity scale.

	Post treatment	4-months follow-up	13-months follow-up
M, (SD)	15.34 (8.02)	16.38 (8.92)	14.18 (8.62)
Clinical significant change, N (%)	42 (41.6)	35 (34.7)	45 (44.6)

Table 3
Results of the Multilevel Linear Modeling analysis of the long-term outcome following ERP.

	B	SE	t
Within-person level parameters			
Linear trajectory	−1.53	.14	−11.05**
Quadratic trajectory	.05	.01	7.88**
Between-person level parameters			
Baseline Y-BOCS	.72	.09	8.24**
BDI	.10	.05	1.80
LEE	−.01	.03	−.48
PDQ	−.02	.04	−.59
Dissmising	.16	.22	.73
Preoccupied	.41	.24	1.70
Fearfull	.36	.22	1.58
Secure	.03	.25	.12
Interaction effects			
Baseline Y-BOCS X Linear trajectory	−.08	.03	−2.31*
Baseline Y-BOCS X Quadratic trajectory	.00	.00	1.33
BDI X Linear trajectory	0.03	0.02	1.54
BDI X Quadratic trajectory	0.00	0.00	−0.91
LEE X Linear trajectory	−0.02	0.01	−1.59
LEE X Quadratic trajectory	0.00	0.00	1.26
PDQ X Linear trajectory	−0.02	0.02	−1.01
PDQ X Quadratic trajectory	0.00	0.00	1.81
Dissmising X Linear trajectory	0.05	0.08	0.66
Dissmising X Quadratic trajectory	0.00	0.00	−0.88
Preoccupied X Linear trajectory	0.16	0.10	1.64
Preoccupied X Quadratic trajectory	−0.01	0.01	−1.80
Fearfull X Linear trajectory	0.20	0.08	2.40*
Fearfull X Quadratic trajectory	−0.01	0.00	−2.29*
Secure X Linear trajectory	0.05	0.10	0.53
Secure X Quadratic trajectory	0.00	0.00	−0.92

Note: Y-BOCS = Yale-Brown Obsessive Compulsive Scale; BDI = Beck Depression Inventory; LEE = Level of Expressed Emotion inventory; PDQ = Personality Diagnostic Questionnaire.
* $p < 0.05$.
** < 0.001.

between the treatment groups through the follow-up period.

Table 3 describes the MLM analysis. Examination of the within-subject, linear and the quadratic models was significant. Therefore, the change in OCD symptom severity is described well by both linear and quadratic trajectories. According to the linear component, there is a decrease in the Y-BOCS score over time, which continues after treatment termination. The quadratic trajectory significantly decelerated the decrease in the Y-BOCS score over time. Therefore, there is a steep reduction in the Y-BOCS during and in the first months after treatment, which is later restrained.

Prediction analysis demonstrated a significant main effect for baseline severity of OCD symptoms, as increased baseline severity of OCD predicted poorer outcome after treatment (Table 3). We did not observe other significant main effects for the remaining predictors. We next proceeded to the interaction analysis. We found a significant baseline OCD severity X time interaction for the linear trajectory (Fig. 1). The results showed that for patients with higher OCD severity at baseline, the rate of symptom reduction was faster throughout the treatment and the first follow-up period, as compared to patients with lower OCD severity at baseline. In addition, the two fearful attachment X time interactions were significant, both for the linear and for the quadratic trajectories (Fig. 2). According to the linear trajectory interaction, patients with increased ratings of fearful attachment style had a more attenuated symptom reduction during and following treatment, as compared to non-fearful patients. The quadratic trajectory demonstrated that for the fearfully attached patients, symptom aggravation in the long-term was moderate as compared to the steeper increase of the non-fearful clients. This suggests that while the improvement of fearful clients was moderate throughout treatment and follow-up, so was their symptom worsening at the long-term. On the other hand, non-fearful clients who improved during and after treatment, regressed at the long-term.

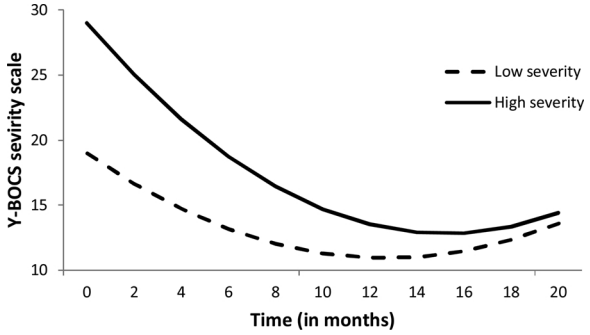

Fig. 1. The Y-BOCS severity scale ratings during and following exposure and response prevention according to baseline symptom severity. Y-BOCS = Yale-Brown Obsessive Compulsive Scale. Low severity corresponds to a baseline Y-BOCS score of 1 *SD* below the mean. High severity corresponds to a baseline Y-BOCS score of 1 *SD* above the mean.

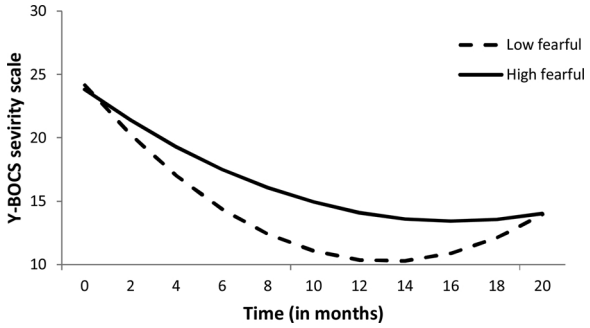

Fig. 2. *The Y-BOCS severity scale ratings during and following exposure and response prevention according to the level of fearful attachment style.* Y-BOCS = Yale-Brown Obsessive Compulsive Scale. Low fearful corresponds to fearful attachment ratings of 1 *SD* below the mean. High fearful corresponds to fearful attachment ratings of 1 *SD* above the mean.

4. Discussion

The present study on intra- and interpersonal predictors of treatment outcome in OCD extends previous prediction and outcome research. We examined predictors of three aspects of outcome of ERP: treatment completion, short-term response and clinical significant change, and the long term trajectory.

In line with our hypothesis, fearful attachment style predicted increased likelihood to dropout before treatment completion. This is consistent with findings from depression research, where distrust of others and suspiciousness towards others moderated treatment dropout (Zilcha-Mano et al., 2016). Because of their insecurity, individuals with fearful attachment style shun intimacy, which is presumably driven by fear of being rejected (Bartholomew & Horowitz, 1991). Thus, the fearfully attached OCD patient might be reluctant when entering treatment and refrain from full engagement in therapy. Surprisingly, despite its potential clinical significance, there is a paucity of research on attachment style and attrition from psychotherapy (Levy et al., 2018). Fearful attachment profile was associated with numerous interpersonal problems, particularly in intimacy and sociability domains (Bartholomew & Horowitz, 1991; Reis & Grenyer, 2004). Psychotherapy in general and particularly exposure treatment for OCD, in which the clients confront their fears, might involve ambivalence and reluctance towards change (Simpson et al., 2010). Fearfully attached clients can experience further challenge as they might be hesitant to accommodate the therapist's empathy and support towards their

difficulties, and therefore dropout prematurely.

As hypothesized, baseline severity of OCD emerged as a significant predictor of treatment dropout. Previous studies found that lower symptom severity at intake was associated with increased attrition rates (Hansen et al., 1992; Steketee et al., 2011). However, this effect was found only for self-report assessments of severity, which share low to moderate variance with clinician-rated assessments (i.e., the Y-BOCS; Anholt et al., 2009). Lower self-perceived severity may hamper patients' treatment motivation (Steketee et al., 2011). On the other hand clinician-rated high OCD severity indicates for a graver clinical and functional picture that impairs one's ability to persist with exposure treatment.

While the short-term outcome of ERP is well established in the literature, about half of the patients are likely to endorse impairing residual symptoms (Abramowitz, Blakey, Reuman, & Buchholz, 2018). This emphasizes the need to enhance the outcome of ERP, which is the main purpose of prediction research. We found that only OCD symptom severity predicted the short-term outcome of ERP, when assessed as clinical significant change. This finding is largely consistent with previous studies (e.g., Knopp et al., 2013). The effect of symptom severity appeared only when using a stringent criterion of outcome. None of the predictors was associated with post-treatment response. It is possible that this response criterion lacks sensitivity and is relatively lenient, thus limiting the ability to identify effect.

The longitudinal analysis demonstrated that treatment gains were maintained through the first months of follow-up, which is consistent with previous studies (Tolin et al., 2007; Whittal et al., 2008). Our results suggest that following ERP, OCD patients continue to experience symptom improvement. However, in the long-term (i.e., approximately one year from baseline), the gains seem to have reached a plateau and a slight worsening was evident. The steep reduction in symptoms during and following treatment was moderated by two predictors: baseline OCD severity and fearful attachment style. Although baseline severity is notoriously considered as a predictor of poor outcome in OCD (Kempe et al., 2007; Knopp et al., 2013), in our study, more severe patients experienced a more rapid symptom reduction during and after ERP, as compared to less severe patients. Up to-date, prediction research included mainly post treatment as the outcome assessment point, which might explain the discrepancy from previous findings (e.g., Knopp et al., 2013). Our findings are consistent with a study that examined the effectiveness of group ERP for OCD, indicating that patients with the most severe OCD symptoms achieved the largest improvements (Himle et al., 2001).

Fearful style emerged as a moderator of the long-term outcome following ERP. Compared to non-fearful clients, the improvement of fearfully attached clients was moderate, which corroborates with previous studies emphasizing the importance of attachment style in the maintenance of OCD (Doron & Kyrios, 2005, 2009; Doron et al., 2012). This finding is consistent with previous studies that demonstrated that adult attachment style modulated the treatment outcome among depressed and anxious patients (Newman, Castonguay, Jacobson, & Moore, 2015; Reiner, Bakermans-Kranenburg, Van IJzendoorn, Fremmer-Bombik, & Beutel, 2016). Fearful, or anxious-avoidant style, reflects a low-confident, withdrawing interpersonal style that is likely to guide interpersonal behavior within the therapeutic relationship and thus, affect treatment outcome (Mikulincer & Shaver, 2008). It is possible that clients who are apprehensive with fear of rejection, or tend to use less self-disclosure, form weaker client-therapist bonds and may be less engaged in exposure tasks (Siefert & Hilsenroth, 2015). In addition, fearful attachment style was found to be associated with poor emotion regulation strategies (Mikulincer & Shaver, 2018). During ERP, fearful clients might use inflexible and maladaptive attempts to regulate intense emotions evoked, leading to poor treatment outcome (Olatunji et al., 2014).

Insecure attachment style was linked with negative cognitive biases, which are common in OCD (Frost & Steketee, 2002; Gamble & Roberts, 2005; Morley & Moran, 2011; Wheaton, Mahaffey, Timpano, Berman, & Abramowitz, 2012). Bowlby suggested that the individual's internal working model works as an interpretive lens of internal and external events, thus affecting one's cognitive response style (Bowlby, 1980). Individuals with fearful attachment style might be characterized with distorted and selective coding of both intra and interpersonal information (Rubin & Mills, 1991; Weems, Berman, Silverman, & Rodriguez, 2002). For example, subjects with fearful attachment style exhibited increased anxiety sensitivity, which involves the belief that anxiety related sensations might have harmful effects psychologically and physically (Weems et al., 2002). Given that cognitive biases such as anxiety sensitivity were associated with OCD symptoms (Wheaton et al., 2012), this line of research should be explored in future studies.

Unlike fearful attached clients, the steep reduction in symptoms of non-fearfully attached patients was decelerated in the long-term and worsening occurred. In fact, in the long-term, fearful and non-fearful clients "met" at similar OCD severity levels, however, with a distinct course. Altogether, findings suggest that fearfully attached clients might benefit from augmentation strategies to enhance treatment outcome. For example, research recently demonstrated the feasibility of schema therapy augmentation for ERP, which contributed to an improved response of OCD patients (Thiel et al., 2016). Clients who are not interpersonally preoccupied and avoidant might benefit from a standard ERP protocol with periodic booster sessions at the long-term to maintain treatment gains.

Personality pathology, which is often characterized with insecure attachment style (Nakash-Eisikovits et al., 2002), did not predict treatment outcome in our study. This finding diverges from previous research that demonstrated a relationship between personality disorders and worse outcome in OCD (Starcevic & Brakoulias, 2017; Steketee et al., 2011). For example, the presence of a personality disorder predicted post-treatment outcome of patients with OCD and panic disorder (Steketee, Chambless, & Tran, 2001). This effect however, was not maintained at a six-month follow-up. It was suggested that clients with a personality disorder would be more ambivalent towards change and consistently seek reassurance from the therapist about their own competence during treatment sessions (Steketee et al., 2001). In line with the finding of the current study, it is possible that insecure attachment style explains such maladaptive responses, thus hampering treatment outcome of OCD.

As opposed to previous studies, we did not find an effect of EE on the short-and long-term outcome of ERP for OCD (Abramowitz, 2006; Chambless & Steketee, 1999). The divergence of the findings might be related to methodological issues. In previous research a family interview to assess EE was used, which is not necessarily correlated with self-report measure of EE (Chambless & Steketee, 1999; Hooley & Parker, 2006). Nonetheless, Steketee, Lam, Chambless, Rodebaugh, and Mccullouch (2007)) demonstrated that the relative criticism (an ingredient of EE) perceived by OCD and panic patients was associated with increased discomfort exposure treatment. Since reduction of antagonistic family behaviors might be related to an improved outcome of treatment for OCD, a better understanding of the relationship between EE and treatment outcome is required (Baruah et al., 2018; Remmerswaal et al., 2016).

The results of our study should be interpreted in light of several limitations. First, we assessed the effect of predictors on a single, combined treatment group. Without a control group, identified predictors can be merely correlates of artifactual effects (Kraemer, Wilson, Fairburn, & Agras, 2002). In addition, given the only 17 patients dropped out might bias the logistic regression results and represent Type 1 error (Nemes, Jonasson, Genell, & Steineck, 2009). Furthermore, attachment style was assessed only at baseline using a one-item instrument. Future studies should incorporate other assessments of attachment style administered at several time points to assess possible change due to treatment (Zalaznik, Weiss, & Huppert, 2017) and replicate findings within larger samples. Finally, the follow-up period

incorporated great variability in the inter-assessment intervals. This limits the representation of the mean as a true indicator of the follow-up period. Nonetheless, Given that MLM treats time as a continuous variable, unequal spacing between the time intervals or unbalanced data is accommodated (Kwok et al., 2008). In addition, the wider range of assessment points enabled a longer term assessment of specific group trajectories.

The findings of the present study have several clinical implications. First, the potential significance of attachment style in OCD was reflected in recent research that taps into of the role of maladaptive schemas, rooted in the person's attachment organization (Kwak & Lee, 2015; Thiel et al., 2014). A preliminary study demonstrated the potential effectiveness of ERP augmented with schema therapy techniques, an integrative approach that involves attachment theory (Thiel et al., 2016). Perhaps OCD clients that are characterized with fearful attachment style would benefit from such augmentation that addresses one's unmet attachment needs (Thiel et al., 2016). Another potentially effective novel adjunct intervention for OCD clients with poor treatment response includes imagery rescripting (Maloney, Koh, Roberts, & Pittenger, 2019). This intervention facilitates the rescripting of past aversive experience such as abandonment and rejection, while legitimating and validating one's needs (Mancini & Mancini, 2018). Augmenting ERP with imagery rescripting may be relevant to insecurely attached clients, as this intervention contrasts the negative meanings inferred in one's prototypic relationships.

In addition, given that the attachment organization is established early in childhood, studies of pediatric OCD samples should assess the attachment style of both children and parents and to assess their relations to treatment outcome. In addition, interventions should further address factors as parental blame and rejection, that might maintain insecure attachment style and that were associated with OCD symptoms and treatment response (Lennertz et al., 2010; Peris et al., 2012).

To conclude, in order to maximize treatment outcome, it is useful to assign treatments based on the "specific" and not the "average" patient (Zilcha-Mano et al., 2016). Given that longitudinal designs of prediction research are lacking (Knopp et al., 2013) future predictor studies should incorporate longer follow-up periods and to further clarify the role of attachment style and of other potential predictors of the long-term outcome of OCD.

Role of funding source

The authors received no funding from an external source.

Declaration of Competing Interest

None.

References

Abdin, E., Koh, K. G. W. W., Med, M., Subramaniam, M., Guo, M.-E., Leo, T., ... Chong, S. A. (2011). Validity of the Personality Diagnostic Questionairre -4 (PDQ-4 +) among mentally ill prison inmates in Singapore. *Journal of Personality Disorders, 25*(6), 834–841. Retrieved from https://s3.amazonaws.com/academia.edu.documents/46407850/Validity_of_the_Personality_Diagnostic_Q20160611-77440-1rm10yd.pdf?AWSAccessKeyId=AKIAIWOWYYGZ2Y53UL3A&Expires=1540675570&Signature=MmZytwvDeyF%2FqwtgOH6a4gGhWPg%3D&response-content-disposition=inli.

Abramowitz, J. (2006). The psychological treatment of obsessive compulsive disorder. *The Canadian Journal of Psychiatry, 51*(7), 407–416.

Abramowitz, J. S., Baucom, D. H., Boeding, S., Wheaton, M. G., Pukay-Martin, N. D., Fabricant, L. E., ... Fischer, M. S. (2013). Treating obsessive-compulsive disorder in intimate relationships: A pilot study of couple-based cognitive-behavior therapy. *Behavior Therapy, 44*(3), 395–407. https://doi.org/10.1016/j.beth.2013.02.005.

Abramowitz, J. S., Baucom, D. H., Wheaton, M. G., Boeding, S., Fabricant, L. E., Paprocki, C., ... Fischer, M. S. (2012). Enhancing exposure and response prevention for OCD: A couple-based approach. *Behavior Modification, 37*(2), 189–210. https://doi.org/10.1177/0145445512444596.

Abramowitz, J. S., Blakey, S. M., Reuman, L., & Buchholz, J. L. (2018). New directions in the cognitive-behavioral treatment of OCD: Theory, research, and practice. *Behavior Therapy, 49*(3), 311–322. https://doi.org/10.1016/j.beth.2017.09.002.

Aderka, I. M., Anholt, G. E., van Balkom, A. J. L. M., Smit, J. H., Hermesh, H., Hofmann, S. G., ... van Oppen, P. (2011). Differences between early and late drop-outs from treatment for obsessive-compulsive disorder. *Journal of Anxiety Disorders, 25*(7), 918–923. https://doi.org/10.1016/j.janxdis.2011.05.004.

Anholt, G. E., van Oppen, P., Emmelkamp, P. M. G., Cath, D. C., Smit, J. H., van Dyck, R., ... van Balkom, A. J. L. M. (2009). Measuring obsessive-compulsive symptoms: Padua inventory-revised vs. yale-brown obsessive compulsive scale. *Journal of Anxiety Disorders, 23*(6), 830–835. https://doi.org/10.1016/j.janxdis.2009.04.004.

Bartholomew, K., & Horowitz, L. M. (1991). Attachment styles among young adults. *Journal of Personality and Social Psychology, 61*(2), 226–244. https://doi.org/10.1037/0022-3514.61.2.226.

Baruah, U., Pandian, R. D., Narayanaswamy, J. C., Bada Math, S., Kandavel, T., & Reddy, Y. C. J. (2018). A randomized controlled study of brief family-based intervention in obsessive compulsive disorder. *Journal of Affective Disorders, 225*(August 2017), 137–146. https://doi.org/10.1016/j.jad.2017.08.014.

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry, 4*(6), 561–571. https://doi.org/10.1001/archpsyc.1961.01710120031004.

Beck, I., & Steer, R. A. (1988). Psychometric properties of the beck depression inventory: Twenty-five years of evaluation. *Clinical Psychology Review, 8*, 77–100.

Belloch, A., Cabedo, E., & Carrió, C. (2008). Empirically grounded clinical interventions: Cognitive versus behaviour therapy in the individual treatment of obsessive-compulsive disorder: Changes in cognitions and clinically significant outcomes at post-treatment and one-year follow-up. *Behavioural and Cognitive Psychotherapy, 36*(05), 521–540. https://doi.org/10.1017/S1352465808004451.

Bowlby, J. (1980). *Attachment and loss.* New York, NY, US: Basic Books.

Brennan, B. P., Lee, C., Elias, J. A., Crosby, J. M., Mathes, B. M., Andre, M.-C., ... Hudson, J. I. (2014). Intensive residential treatment for severe obsessive-compulsive disorder: Characterizing treatment course and predictors of response. *Journal of Psychiatric Research, 56*, 98–105. https://doi.org/10.1016/j.jpsychires.2014.05.008.

Chambless, D. L., & Steketee, G. (1999). Expressed emotion and behavior therapy outcome: A prospective study with obsessive–Compulsive and agoraphobic outpatients. *Journal of Consulting and Clinical Psychology, 67*(5), 658–665. https://doi.org/10.1037/0022-006X.67.5.658.

Cherian, A. V., Math, S. B., Kandavel, T., & Reddy, Y. C. J. (2014). A 5-year prospective follow-up study of patients with obsessive-compulsive disorder treated with serotonin reuptake inhibitors. *Journal of Affective Disorders, 152–154*(1), 387–394. https://doi.org/10.1016/j.jad.2013.09.042.

Cherian, A. V., Pandian, D., Bada Math, S., Kandavel, T., & Janardhan Reddy, Y. C. (2014). Family accommodation of obsessional symptoms and naturalistic outcome of obsessive-compulsive disorder. *Psychiatry Research, 215*(2), 372–378. https://doi.org/10.1016/j.psychres.2013.11.017.

Ciechanowski, P. S., Katon, W. J., Russo, J. E., & Walker, E. A. (2001). The patient-provider relationship: Attachment theory and adherence to treatment in diabetes. *The American Journal of Psychiatry, 158*(1), 29–35. https://doi.org/10.1176/appi.ajp.158.1.29.

Cole, J., & Kazarian, S. (1988). The level of expressed emotion scale: A new measure of expressed emotion. *Journal of Clinical Psychology, 44*, 392–397.

Diefenbach, G. J., Wootton, B. M., Bragdon, L. B., Moshier, S. J., & Tolin, D. F. (2015). Treatment outcome and predictors of internet guided self-help for obsessive-compulsive disorder. *Behavior Therapy, 46*(6), 764–774. https://doi.org/10.1016/J.BETH.2015.06.001.

DiMauro, J., Domingues, J., Fernandez, G., & Tolin, D. F. (2013). Long-term effectiveness of CBT for anxiety disorders in an adult outpatient clinic sample: A follow-up study. *Behaviour Research and Therapy, 51*(2), 82–86. https://doi.org/10.1016/j.brat.2012.10.003.

Doron, G., & Kyrios, M. (2005). Obsessive compulsive disorder: A review of possible specific internal representations within a broader cognitive theory. *Clinical Psychology Review, 25*(4), 415–432. https://doi.org/10.1016/j.cpr.2005.02.002.

Doron, G., Moulding, R., Kyrios, M., Nedeljkovic, M., & Mikulincer, M. (2009). Adult attachment insecurities are related to obsessive compulsive phenomena. *Journal of Social and Clinical Psychology, 28*(8), 1022–1049.

Doron, G., Moulding, R., Nedeljkovic, M., Kyrios, M., Mikulincer, M., & Sar-El, D. (2012). Adult attachment insecurities are associated with obsessive compulsive disorder. *Psychology and Psychotherapy Theory Research and Practice, 85*(2), 163–178. https://doi.org/10.1111/j.2044-8341.2011.02028.x.

Eisen, J. L., Mancebo, M. A., Pinto, A., Coles, M. E., Pagano, M. E., Stout, R., ... Rasmussen, S. A. (2006). Impact of obsessive-compulsive disorder on quality of life. *Comprehensive Psychiatry, 47*(4), 270–275. https://doi.org/10.1016/j.comppsych.2005.11.006.

First, M., Spitzer, R., Gibbon, M., & Williams, J. B. (1999). *Structured clinical interview for DSM-IV Axis I disorders patient edition (SCID-I/P version 2.0).* Lisse, the Netherlands: Swets & Zeitlinger BV.

Fisher, P. L., & Wells, A. (2005). How effective are cognitive and behavioral treatments for obsessive-compulsive disorder? A clinical significance analysis. *Behaviour Research and Therapy, 43*(12), 1543–1558. https://doi.org/10.1016/j.brat.2004.11.007.

Fossati, A., Maffei, C., Bagnato, M., & Donati, D. (1998). Brief communication: Criterion validity of the personality diagnostic questi. *Journal of Personality, 12*(2), 172–178.

Frost, R., & Steketee, G. (2002). *Cognitive approaches to obsessions and compulsions: Theory, assessment and treatment.* Oxford: Elsevier.

Gamble, S. A., & Roberts, J. E. (2005). Adolescents' perceptions of primary caregivers and cognitive style: The roles of attachment security and gender. *Cognitive Therapy and Research, 29*(2), 123–141. https://doi.org/10.1007/s10608-005-3160-7.

Gilliam, C. M., Diefenbach, G. J., Whiting, S. E., & Tolin, D. F. (2010). Stepped care for

obsessive-compulsive disorder: An open trial. *Behaviour Research and Therapy, 48*(11), 1144–1149. https://doi.org/10.1016/J.BRAT.2010.07.010.
Goodman, W. K., Price, L. H., Rasmussen, S. A., Mazure, C., Delgado, P., Heninger, G. R., ... Charney, D. S. (1989). The yale-brown obsessive compulsive scale: II. Validity. *Archives of General Psychiatry, 46*, 1012–1016.
Goodman, W. K., Price, L. H., Rasmussen, S. A., Mazure, C., Fleischmann, R. L., Hill, C. L., ... Charney, D. S. (1989). The yale-brown obsessive compulsive scale. I. Development, use, and reliability. *Archives of General Psychiatry*. https://doi.org/10.1001/archpsyc.1989.01810110048007.
Griffin, D., & Bartholomew, K. (1994). Models of the self and other: Fundamental dimensions underlying measures of adult attachment. *Journal of Personality and Social Psychology, 67*(3), 430–445.
Grunes, M. S., Nezinoglu, F., & McKay, D. (2001). Family involvement in the behavioral treatment of obsessive-compulsive disorder: A preliminary investigation. *Behavior Therapy, 32*(4), 803–820. https://doi.org/10.1016/S0005-7894(01)80022-8.
Haaland, A. T., Vogel, P. A., Launes, G., Haaland, V.? ?ksendal, Hansen, B., Solem, S., ... Himle, J. A. (2011). The role of early maladaptive schemas in predicting exposure and response prevention outcome for obsessive-compulsive disorder. *Behaviour Research and Therapy, 49*(11), 781–788. https://doi.org/10.1016/j.brat.2011.08.007.
Hale, W. W., Raaijmakers, Q. A. W., Gerlsma, C., & Meeus, W. (2007). Does the level of expressed emotion (LEE) questionnaire have the same factor structure for adolescents as it has for adults? *Social Psychiatry and Psychiatric Epidemiology, 42*(3), 215–220. https://doi.org/10.1007/s00127-006-0145-0.
Hansen, A. M. D., Hoogduin, C. A. L., Schaap, C., & Dehaan, E. (1992). Do dropouts differ from successfully treated obsessive compulsives. *Behaviour Research and Therapy, 30*(5), 547–550.
Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology, 52*(3), 511–524. https://doi.org/10.1037/0022-3514.52.3.511.
Himle, J. A., Rassi, S., Haghighatgou, H., Krone, K. P., Nesse, R. M., & Abelson, J. (2001). Group behavioral Therapy of obsessive-compulsive disorder: Seven VS. twelve-week outcomes. *Depression and Anxiety, 13*, 161–165. https://doi.org/10.1002/da.1032 Retrieved from.
Hooley, J. M., & Gotlib, I. H. (2000). A diathesis-stress conceptualization of expressed emotion and clinical outcome. *Applied and Preventive Psychology, 9*(3), 135–151. https://doi.org/10.1016/S0962-1849(05)80001-0.
Hooley, J. M., & Parker, H. A. (2006). Measuring expressed emotion: An evaluation of the shortcuts. *Journal of Family Psychology: JFP: Journal of the Division of Family Psychology of the American Psychological Association (Division 43), 20*(3), 386–396. https://doi.org/10.1037/0893-3200.20.3.386.
Hooley, J. M., & Teasdale, J. D. (1989). Predictors of relapse in unipolar depressives: Expressed emotion, marital distress, and perceived criticism. *Journal of Abnormal Psychology, 98*(3), 229–235.
Hyler, S. (1994). *Personality diagnostic questionnaire (PDQ-4 +)*. New York: New York State Psychiatric Institute.
Insel, T. R. (2009). Translating scientific opportunity into public health impact. *Archives of General Psychiatry, 66*(2), 128. https://doi.org/10.1001/archgenpsychiatry.2008.540.
Jacobson, N. S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology, 59*(1), 12–19. https://doi.org/10.1037/0022-006X.59.1.12.
Keeley, M. L., Storch, E. A., Merlo, L. J., & Geffken, G. R. (2008). Clinical predictors of response to cognitive-behavioral therapy for obsessive-compulsive disorder. *Clinical Psychology Review, 28*(1), 118–130. https://doi.org/10.1016/j.cpr.2007.04.003.
Kempe, P. T., Van Oppen, P., De Haan, E., Twisk, J. W. R., Sluis, A., Smit, J. H., ... Van Balkom, A. J. L. M. (2007). Predictors of course in obsessive-compulsive disorder: Logistic regression versus Cox regression for recurrent events. *Acta Psychiatrica Scandinavica, 116*(3), 201–210. https://doi.org/10.1111/j.1600-0447.2007.00997.x.
Knopp, J., Knowles, S., Bee, P., Lovell, K., & Bower, P. (2013). A systematic review of predictors and moderators of response to psychological therapies in OCD: Do we have enough empirical evidence to target treatment? *Clinical Psychology Review, 33*(8), 1067–1081. https://doi.org/10.1016/j.cpr.2013.08.008.
Kraemer, H., Wilson, G., Fairburn, C., & Agras, W. (2002). Mediators and moderators of treatment effects in randomized clinical trials. *Archives of General Psychiatry, 59*(10), 877–883. https://doi.org/10.1001/archpsyc.59.10.877.
Kwak, K.-H., & Lee, J. (2015). A comparative study of early maladaptive schemas in obsessive-compulsive disorder and panic disorder. *Psychiatry Research, 230*, 757–762. https://doi.org/10.1016/j.psychres.2015.11.015.
Kwok, O.-M., Underhill, A. T., Berry, J. W., Luo, W., Elliott, T. R., & Yoon, M. (2008). Analyzing longitudinal data with multilevel models: An example with individuals living with lower extremity intra-articular fractures. *Rehabilitation Psychology, 53*(3), 370–386. https://doi.org/10.1037/a0012765.
Lennertz, L., Hj, G., Ruhrmann, S., Rampacher, F., Vogeley, A., Schulze-Rauschenbach, S., ... Wagner, M. (2010). Perceived parental rearing in subjects with obsessive-compulsive disorder and their siblings. *Acta Psychiatrica Scandinavica, 121*, 280–288. https://doi.org/10.1111/j.1600-0447.2009.01469.x.
Levy, K. N., Kivity, Y., Johnson, B. N., & Gooch, C. V. (2018). Adult attachment as a predictor and moderator of psychotherapy outcome: A meta-analysis. *Journal of Clinical Psychology*, 1–18. https://doi.org/10.1002/jclp.22685.
Maloney, G., Koh, G., Roberts, S., & Pittenger, C. (2019). Imagery rescripting as an adjunct clinical intervention for obsessive compulsive disorder. *Journal of Anxiety Disorders, 66*, 102110. https://doi.org/10.1016/j.janxdis.2019.102110.
Mancini, A., & Mancini, F. (2018). Rescripting memory, redefining the self: A meta-emotional perspective on the hypothesized mechanism(s) of imagery rescripting. *Frontiers in Psychology, 9*, 581. https://doi.org/10.3389/fpsyg.2018.00581.
Martin, D. J., Garske, J. P., & Davis, M. K. (2000). Relation of the therapeutic alliance with outcome and other variables: A meta-analytic review. *Journal of Consulting and Clinical Psychology, 68*(3), 438–450. https://doi.org/10.1037/0022-006X.68.3.438.
McKay, D., Sookman, D., Neziroglu, F., Wilhelm, S., Stein, D. J., Kyrios, M., ... Veale, D. (2015). Efficacy of cognitive-behavioral therapy for obsessive–compulsive disorder. *Psychiatry Research, 225*(3), 236–246. https://doi.org/10.1016/j.psychres.2014.11.058.
Mikulincer, M., & Shaver, P. (2008). Adult attachment and affect regulation. In J. Cassidy, & P. Shaver (Eds.). *Handbook of attachment: Theory, research, and clinical applications* (pp. 503–531). New York: Guilford Press. Retrieved from http://psycnet.apa.org/record/2008-13837-024.
Mikulincer, M., & Shaver, P. (2018). Attachment orientations and emotion regulation. *Current Opinion in Psychology, 25*, 6–10. https://doi.org/10.1016/J.COPSYC.2018.02.006.
Morley, T. E., & Moran, G. (2011). The origins of cognitive vulnerability in early childhood: Mechanisms linking early attachment to later depression. *Clinical Psychology Review, 31*(7), 1071–1082. https://doi.org/10.1016/j.cpr.2011.06.006.
Nakash-Eisikovits, O., Dutra, L., & Westen, D. (2002). Relationship between attachment patterns and personality pathology in adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 41*(9), 1111–1123. https://doi.org/10.1097/00004583-200209000-00012.
Nemes, S., Jonasson, J. M., Genell, A., & Steineck, G. (2009). Bias in odds ratios by logistic regression modelling and sample size. *BMC Medical Research Methodology, 9*(1), 56. https://doi.org/10.1186/1471-2288-9-56.
Newman, M. G., Castonguay, L. G., Jacobson, N. C., & Moore, G. A. (2015). Adult attachment as a moderator of treatment outcome for generalized anxiety disorder: Comparison between cognitive–Behavioral therapy (CBT) plus interpersonal and emotional processing therapy. *Journal of Consulting and Clinical Psychology, 83*(5), 915–925. https://doi.org/10.1037/a0039359.Adult.
Ogrodniczuk, J., Joyce, A., & Piper, W. (2005). Strategies for reducing patient-initiated premature termination of psychotherapy. *Harvard Review of Psychiatry, 13*, 57–70. https://doi.org/10.1080/10673220590956429 Retrieved from.
Olatunji, B. O., Ferreira-Garcia, R., Caseras, X., Fullana, M. A., Wooderson, S., Speckens, A., ... Mataix-Cols, D. (2014). Predicting response to cognitive behavioral therapy in contamination-based obsessive–compulsive disorder from functional magnetic resonance imaging. *Psychological Medicine, 44*(10), 2125–2137. https://doi.org/10.1017/S0033291713002766.
Olatunji, B. O., Rosenfield, D., Tart, C. D., Cottraux, J., Powers, M. B., & Smits, J. A. J. (2013). Behavioral versus cognitive treatment of obsessive-compulsive disorder: An examination of outcome and mediators of change. *Journal of Consulting and Clinical Psychology, 81*(3), 415–428. https://doi.org/10.1037/a0031865.
Ong, C. W., Clyde, J. W., Bluett, E. J., Levin, M. E., & Twohig, M. P. (2016). Dropout rates in exposure with response prevention for obsessive-compulsive disorder: What do the data really say? *Journal of Anxiety Disorders, 40*, 8–17. https://doi.org/10.1016/j.janxdis.2016.03.006.
Öst, L.-G., Havnen, A., Hansen, B., & Kvale, G. (2015). Cognitive behavioral treatments of obsessive–compulsive disorder. A systematic review and meta-analysis of studies published 1993–2014. *Clinical Psychology Review, 40*, 156–169. https://doi.org/10.1016/j.cpr.2015.06.003.
Pace, S. M., Thwaites, R., & Freeston, M. H. (2011). Exploring the role of external criticism in Obsessive Compulsive Disorder: A narrative review. *Clinical Psychology Review, 31*(3), 361–370. https://doi.org/10.1016/j.cpr.2011.01.007.
Peris, T. S., Sugar, C. A., Bergman, R. L., Chang, S., Langley, A., & Piacentini, J. (2012). Family factors predict treatment outcome for pediatric obsessive-compulsive disorder. *Journal of Consulting and Clinical Psychology, 80*(2), 255–263. https://doi.org/10.1037/a0027084.
Raudenbush, S., & Bryk, A. (2002). *Hierarchical linear models: Applications and data analysis methods.* Retrieved fromThousand Oaks, Ca: Sage Publications. https://books.google.com/books?hl=iw&lr=&id=uyCV0CNGDLQC&oi=fnd&pg=PR17&ots=qB3NZtZ-YF&sig=rAGyIFpZYpxM9uC_p6LGPNpxd3g.
Ravitz, P., Maunder, R., Hunter, J., Sthankiya, B., & Lancee, W. (2010). Adult attachment measures: A 25-year review. *Journal of Psychosomatic Research, 69*(4), 419–432. https://doi.org/10.1016/j.jpsychores.2009.08.006.
Reiner, I., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Fremmer-Bombik, E., & Beutel, M. (2016). Adult attachment representation moderates psychotherapy treatment efficacy in clinically depressed inpatients. *Journal of Affective Disorders, 195*, 163–171. https://doi.org/10.1016/J.JAD.2016.02.024.
Reis, S., & Grenyer, B. F. S. (2004). Fearful attachment, working alliance and treatment response for individuals with major depression. *Clinical Psychology and Psychotherapy Clin. Psychol. Psychother, 11*, 414–424. https://doi.org/10.1002/cpp.428.
Remmerswaal, K. C. P., Batelaan, N. M., Smit, J. H., Van Oppen, P., & Van Balkom, A. J. L. M. (2016). Feasibility and outcome of a brief cognitive behaviour therapy family intervention for patients with obsessive-compulsive disorder: A pilot study. *Psychotherapy and Psychosomatics, 85*(3), 185–186. https://doi.org/10.1159/000443511.
Renshaw, K. D., Chambless, D. L., & Steketee, G. (2003). Perceived criticism predicts severity of anxiety symptoms after behavioral treatment in patients with obsessive-compulsive disorder and panic disorder with agoraphobia. *Journal of Clinical Psychology, 59*(4), 411–421. https://doi.org/10.1002/jclp.10048.
Renshaw, K. D., Steketee, G., Rodrigues, C. S., & Caska, C. M. (2010). Obsessive-compulsive disorder. In J. G. Beck (Ed.). *Interpersonal processes in the anxiety disorders: Implications for understanding psychopathology and treatment* (pp. 153–177). Washington, DC, US: American Psychological Association.
Rosa-Alcázar, A. I., Sánchez-Meca, J., Gómez-Conesa, A., & Marín-Martínez, F. (2008). Psychological treatment of obsessive-compulsive disorder: A meta-analysis. *Clinical Psychology Review, 28*(8), 1310–1325. https://doi.org/10.1016/j.cpr.2008.07.001.
Rosqvist, J., Egan, D., Manzo, P., Baer, L., Jenike, M. A., & Willis, B. S. (2001). Home-

based behavior therapy for obsessive–Compulsive disorder: A case series with data. *Journal of Anxiety Disorders, 15*(5), 395–400. https://doi.org/10.1016/S0887-6185(01)00071-8.

Rubin, K. H., & Mills, R. S. (1991). *Conceptualizing Developmental Pathways to Internalizing Disorders in Childhood, 23*(3), 300–317. https://doi.org/10.1037/h0079019.

Schneider, R. L., Arch, J. J., & Wolitzky-Taylor, K. B. (2015). The state of personalized treatment for anxiety disorders: A systematic review of treatment moderators. *Clinical Psychology Review, 38*, 39–54. https://doi.org/10.1016/J.CPR.2015.02.004.

Sharma, E., Thennarasu, K., & Reddy, Y. (2014). Long-term outcome of obsessive-compulsive disorder in adults: A meta-analysis. *The Journal of Clinical Psychiatry, 75*(9), 1019–1027. Retrieved from http://www.psychiatrist.com/JCP/article/Pages/2014/v75n09/v75n0923.aspx.

Siefert, C. J., & Hilsenroth, M. J. (2015). Client attachment status and changes in therapeutic alliance early in treatment. *Clinical Psychology & Psychotherapy, 22*(6), 677–686. https://doi.org/10.1002/cpp.1927.

Simpson, H. B., Foa, E. B., Liebowitz, M. R., Ledley, D. R., Huppert, J. D., Cahill, S., ... Petkova, E. (2008). A randomized, controlled trial of cognitive-behavioral therapy for augmenting pharmacotherapy in obsessive-compulsive disorder. *The American Journal of Psychiatry, 165*(5), 621–630. https://doi.org/10.1176/appi.ajp.2007.07091440.

Simpson, H. B., Huppert, J. D., Petkova, E., Foa, E. B., & Liebowitz, M. R. (2006). Response versus remission in obsessive-compulsive disorder. *The Journal of Clinical Psychiatry, 67*(02), 269–276. https://doi.org/10.4088/JCP.v67n0214.

Simpson, H. B., Zuckoff, A. M., Maher, M. J., Page, J. R., Franklin, M. E., Foa, E. B., ... Wang, Y. (2010). Challenges using motivational interviewing as an adjunct to exposure therapy for obsessive-compulsive disorder. *Behaviour Research and Therapy, 48*(10), 941–948. https://doi.org/10.1016/j.brat.2010.05.026.

Skapinakis, P., Caldwell, D., Hollingworth, W., Bryden, P., Fineberg, N., Salkovskis, P., ... Lewis, G. (2016). A systematic review of the clinical effectiveness and cost-effectiveness of pharmacological and psychological interventions for the management of obsessive-compulsive disorder in children/adolescents and adults. *Health Technology Assesment, 20*(43), 1–392. https://doi.org/10.3310/hta20430.

Smith, A. E. M., Msetfi, R. M., & Golding, L. (2010). Client self rated adult attachment patterns and the therapeutic alliance: A systematic review. *Clinical Psychology Review, 30*(3), 326–337. https://doi.org/10.1016/J.CPR.2009.12.007.

Starcevic, V., & Brakoulias, V. (2017). Current understanding of the relationships between obsessive-compulsive disorder and personality disturbance. *Current Opinion in Psychiatry, 30*(1), 50–55. https://doi.org/10.1097/YCO.0000000000000291.

Steketee, G., Chambless, D. L., & Tran, G. Q. (2001). Effects of axis I and II comorbidity on behavior therapy outcome for obsessive-compulsive disorder and agoraphobia. *Comprehensive Psychiatry, 42*(1), 76–86. https://doi.org/10.1053/comp.2001.19746.

Steketee, G., Lam, J. N., Chambless, D. L., Rodebaugh, T. L., & Mccullouch, C. E. (2007). Effects of perceived criticism on anxiety and depression during behavioral treatment of anxiety disorders. *Behaviour Research and Therapy, 45*, 11–19. https://doi.org/10.1016/j.brat.2006.01.018.

Steketee, G., Siev, J., Fama, J. M., Keshaviah, A., Chosak, A., & Wilhelm, S. (2011). Predictors of treatment outcome in modular cognitive therapy for obsessive-compulsive disorder. *Depression and Anxiety, 28*(4), 333–341. https://doi.org/10.1002/da.20785.

Subramaniam, M., Soh, P., Vaingankar, J. A., Picco, L., & Chong, S. A. (2013). Quality of life in obsessive-compulsive disorder: Impact of the disorder and of treatment. *CNS Drugs, 27*(5), 367–383. https://doi.org/10.1007/s40263-013-0056-z.

Swift, J. K., & Greenberg, R. P. (2012). Premature discontinuation in adult psychotherapy: A meta-analysis. *Journal of Consulting and Clinical Psychology, 80*(4), 547–559. https://doi.org/10.1037/a0028226.

Thiel, N., Jacob, G. A., Tuschen-Caffier, B., Herbst, N., Külz, A. K., Hertenstein, E., ... Voderholzer, U. (2016). Schema therapy augmented exposure and response prevention in patients with obsessive-compulsive disorder: Feasibility and efficacy of a pilot study. *Journal of Behavior Therapy and Experimental Psychiatry, 52*, 59–67. https://doi.org/10.1016/j.jbtep.2016.03.006.

Thiel, N., Tuschen-Caffier, B., Herbst, N., Külz, A. K., Nissen, C., Hertenstein, E., ... Voderholzer, U. (2014). The prediction of treatment outcomes by early maladaptive schemas and schema modes in obsessive-compulsive disorder. *BMC Psychiatry, 14*, 362. https://doi.org/10.1186/s12888-014-0362-0.

Tolin, D. F., Abramowitz, J. S., & Diefenbach, G. J. (2005). Defining response in clinical trials for obsessive-compulsive disorder: A signal detection analysis of the Yale-Brown obsessive compulsive scale. *The Journal of Clinical Psychiatry, 66*(12), 1549–1557. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/16401156.

Tolin, D. F., Hannan, S., Maltby, N., Diefenbach, G. J., Worhunsky, P., & Brady, R. E. (2007). A randomized controlled trial of self-directed versus therapist-directed cognitive-behavioral therapy for obsessive-compulsive disorder patients with prior medication trials. *Behavior Therapy, 38*(2), 179–191. https://doi.org/10.1016/J.BETH.2006.07.001.

Van Balkom, A. J. L. M., Emmelkamp, P. M. G., Eikelenboom, M., Hoogendoorn, A. W., Smit, J. H., & Van Oppen, P. (2012). Cognitive therapy versus fluvoxamine as a second-step treatment in obsessive-compulsive disorder nonresponsive to first-step behavior therapy. *Psychotherapy and Psychosomatics, 81*(6), 366–374. https://doi.org/10.1159/000339369.

van Oppen, P., van Balkom, A., De Haan, E., & van Dyck, R. (2005). Cognitive therapy and exposure in vivo alone and in combination with fluvoxamine in obsessive-compulsive disorder: A 5-year follow-up. *Journal of Clinical Psychiatry, 66*(11), 1415–1422. Retrieved from http://psycnet.apa.org/psycinfo/2006-10369-011.

Van Oppen, P., Van Balkom, A. J. L. M., Smit, J. H., Schuurmans, J., Van Dyck, R., & Emmelkamp, P. M. G. (2010). Does the therapy manual or the therapist matter most in treatment of obsessive-compulsive disorder? A randomized controlled trial of exposure with response or ritual prevention in 118 patients. *The Journal of Clinical Psychiatry, 71*(9), 1158–1167. https://doi.org/10.4088/JCP.08m04990blu.

Weems, C. F., Berman, S. L., Silverman, W. K., & Rodriguez, E. T. (2002). The relation between anxiety sensitivity and attachment style in adolescence and early adulthood. *Journal of Psychopathology and Behavioral Assessment, 24*. Retrieved from https://link.springer.com/content/pdf/10.1023/A:1016058600416.pdf.

Wheaton, M. G., Mahaffey, B., Timpano, K. R., Berman, N. C., & Abramowitz, J. S. (2012). The relationship between anxiety sensitivity and obsessive-compulsive symptom dimensions. *Journal of Behavior Therapy and Experimental Psychiatry, 43*(3), 891–896. https://doi.org/10.1016/j.jbtep.2012.01.001.

Whittal, M. L., & McLean, P. D. (1999). CBT for OCD: The rationale, protocol, and challenges. *Cognitive and Behavioral Practice, 6*(4), 383–396. https://doi.org/10.1016/S1077-7229(99)80057-1.

Whittal, M. L., Robichaud, M., Thordarson, D. S., & McLean, P. D. (2008). Group and individual treatment of obsessive-compulsive disorder using cognitive therapy and exposure plus response prevention: A 2-Year follow-up of two randomized trials. *Journal of Consulting and Clinical Psychology, 76*(6), 1003–1014. https://doi.org/10.1037/a0013076.

Wilhelm, S., Berman, N. C., Keshaviah, A., Schwartz, R. A., & Steketee, G. (2015). Mechanisms of change in cognitive therapy for obsessive compulsive disorder: Role of maladaptive beliefs and schemas. *Behaviour Research and Therapy, 65*, 5–10. https://doi.org/10.1016/j.brat.2014.12.006.

Zalaznik, D., Weiss, M., & Huppert, J. D. (2017). Improvement in adult anxious and avoidant attachment during cognitive behavioral therapy for panic disorder. *Psychotherapy Research,* 1–17. https://doi.org/10.1080/10503307.2017.1365183.

Zilcha-Mano, S., Keefe, J. R., Chui, H., Rubin, A., Barrett, M. S., & Barber, J. P. (2016). Reducing dropout in treatment for depression. *The Journal of Clinical Psychiatry, 77*(12), e1584–e1590. https://doi.org/10.4088/JCP.15m10081.