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ORIGINAL RESEARCH

An outcome study of an intensive, out-patient exposure and response prevention therapy for obsessive compulsive disorder

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Abstract

Exposure and response prevention (ERP) is the first-line psychological treatment for obsessive compulsive disorder (OCD). Recent research shows that the Bergen 4-day Treatment (B4DT), which is a concentrated ERP program, can be very effective. However, this intensive format has not been widely implemented, and it is unclear whether positive outcomes are unique to B4DT, or whether a similar intensive ERP program (not based on B4DT) is equally effective. We examined short- and long-term outcomes of the Melbourne Intensive Treatment-OCD (MIT-O) program, an out-patient intensive ERP program for OCD involving an intensive phase of four full-day sessions conducted over two weeks, and a supportive 21-day phase involving self-directed tasks and twice-a-week check-in calls with the therapy team. Participants were 21 individuals with OCD. The severity of OCD, depression, anxiety, stress, obsessive beliefs, and emotion regulation difficulties were assessed at four time points (pre-treatment, post-treatment, 6-month, and 12-month follow-up). Results showed a large and significant decrease in OCD and obsessive beliefs at post-treatment. These improvements were maintained at 12-month follow-up. Using international consensus criteria for treatment response, almost all participants (90.5%) showed at least partial treatment response and one-third were in remission at the final assessment. These results showed that the MIT-O program was effective, but post-treatment and 12-month remission rates were somewhat less favourable than previously published results from the B4DT program. Nevertheless, the MIT-O post-treatment outcomes were comparable to other CBT programs for OCD and should be considered when other longer term treatment formats such as in-patient treatments are not feasible.

Key learning aims

(1) To evaluate the effectiveness of an intensive exposure and response prevention program in reducing obsessive compulsive disorder (OCD) symptoms.
(2) To examine the long-term maintenance of treatment gains at 6-month and 12-month follow-up assessments.
(3) To report the treatment response rate and remission outcomes achieved through the intensive format.
(4) To consider the broader implementation of intensive exposure and response prevention programs as an alternative format for OCD treatment.

Keywords: cognitive behavioural therapy (CBT); obsessive compulsive disorder (OCD); effectiveness; exposure and response prevention (ERP)

Introduction

Obsessive compulsive disorder (OCD) is a psychiatric disorder with a 12-month prevalence of over 1% in the population, typically presenting in patients prior to their mid-twenties (American Psychiatric Association, 2022). It is notable for its pervasiveness across cultural, gender, age, and socio-economic variables. OCD has a high burden of disease for both sufferers and those close to them. Left untreated, the effects of OCD are debilitating on one's psychological, behavioural, and social wellbeing (Remmerswaal *et al.*, 2020).

OCD is characterized by the presence of intrusive and unwanted thoughts, urges, or impulses (i.e. obsessions) that occur frequently and cause distress. Typical obsessions include concerns about contamination, thoughts about harming others or oneself, unacceptable sexual or violent thoughts and images, and a need for order and symmetry. These obsessions trigger repetitive and ritualistic behaviors (i.e. compulsions), which are an attempt to neutralize the obsessions and reduce fear and distress. Common OCD compulsions include excessive and repetitive washing, cleaning, ordering, checking behaviours, and mental rituals (American Psychiatric Association, 2022).

According to the cognitive behavioural model of OCD, intrusive thoughts, urges, or impulses are normal phenomena experienced by most people and are typically dismissed without distress. However, individuals develop OCD if they are unable to tolerate uncertainty, form beliefs about the importance of these intrusions, feel personally responsible for negative consequences, and over-estimate the danger and threat posed by having such intrusions. The misinterpretation of intrusions then results in high levels of anxiety, which in turn leads to attempts at reducing the anxiety through compulsive behaviours and avoidance. Although compulsions temporarily alleviate distress, they reinforce the OCD beliefs and increase fear and avoidance over time.

Consistent with the cognitive behavioural model, research has shown that cognitive behavioural treatments for OCD are effective (Öst *et al.*, 2015). In a recent review of treatment studies of CBT delivered in real-world clinical settings, Öst *et al.* (2022) reported very large effect sizes for treatment outcomes and long-term follow-up remission rates of 57%. A core component of CBT for OCD is exposure and response prevention (ERP), which targets the reinforcement of fear and avoidance by encouraging patients to systematically confront feared OCD triggers whilst refraining from engaging in compulsions or other neutralizing behaviours. Through repeated and prolonged ERP, OCD beliefs are disconfirmed as patients learn that they can cope with the discomfort of their intrusions without catastrophic consequences. ERP is widely accepted as the most effective CBT intervention available for OCD, as supported by Cochrane reviews and major peer-reviewed literature (Ferrando and Selai, 2021; Gava *et al.*, 2007; Reid *et al.*, 2021; Skapinakis *et al.*, 2016). Several randomized controlled trials (RCTs) (e.g. Cottraux *et al.*, 2001, Foa *et al.*, 2005; Olatunji *et al.*, 2013) indicate that ERP is more efficacious at reducing OCD symptoms than other existing treatments, including pharmacological interventions (Öst *et al.*, 2022). For example, Foa *et al.* (2005) found that ERP with and without serotonin reuptake inhibitors (SRIs) was more effective at reducing OCD symptoms than SRIs alone.

ERP is highly effective across a variety of different treatment formats. Thiel *et al.* (2016) showed that ERP is effective at reducing OCD symptoms in in-patient settings, with success rates as high as 69%. This efficacy can also be seen within out-patient settings, with Capel *et al.* (2023) reporting a 58% decrease in OCD symptoms, whilst Moulding *et al.* (2023) showed that even a 10-week low-intensity out-patient treatment program for OCD achieved at least 25% symptom improvements in more than 50% of participants. Additionally, partial hospitalization with short bursts of ERP is understood to be efficacious (Hezel and Simpson, 2019). Valderhaug *et al.* (2007) supports the use of an out-patient CBT treatment program for OCD, suggesting it can be successfully implemented in a non-academic child psychiatric setting. Similarly, Friedman *et al.* (2003) found this outcome to be the same within multi-ethnic urban communities, thus both studies ultimately support the generalization of out-patient treatment to the population.

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ERP further appears to be effective at reducing OCD across intensities, with Capel *et al.* (2023) finding that ERP can be significantly more effective when performed at high intensities, allowing for a more cost- and time-effective treatment program for OCD. Similarly, Abramowitz *et al.* (2005) found that ERP can be effective in reducing OCD in programs as short as 4 weeks with 15 two-hour sessions. This method of ERP seems to not only be beneficial at reducing OCD in the interim, but appears to have sustained effects of up to 3 months after treatment (Storch *et al.*, 2009).

Contemporary research on ERP appears to favour the implementation of intensive yet brief interventions, with developments of programs such as the Bergen 4-day Treatment (B4DT) that has developed empirically supported exemplars of how concentrated ERP can be used to reduce OCD (Kvale and Hansen, 2014). The Bergen studies offered insight into the impact of a rapid ERP intervention on OCD, finding a response rate of 90% post-treatment and a remission rate of 70% at 3 months. A unique characteristic of this intervention involved the patients engaging in a condensed 4-day period with brief ERP sessions on a 1-to-1 basis, combined with group sessions where the number of participants was ratioed to the number of therapists (Kvale *et al.*, 2018). Similar outcomes for the B4DT were found for adolescents with OCD (Riise *et al.*, 2018).

It should be noted that the B4DT is a novel program and thus the effects of this program may differ in other cultures and healthcare systems. Despite this, when increasing the sample size of the patients, treatment response and remission rates at post-treatment remained high at 93.8% and 76.6%, respectively (Hansen *et al.*, 2018). Additionally, at a 12-month follow-up analysis, Hansen *et al.* (2018) found 67.7% remained at remission but there was an increase in the number of asymptomatic patients from 29.2% at post-treatment to 38.5% at the 12-month follow-up.

As B4DT is now widely recognized as an effective method of reducing OCD in a Scandinavian setting, there is scope to explore how and if an ERP program can be modified in a similar format as the B4DT program and still be effective. We do not yet know whether the positive treatment and long-term follow-up outcomes found in previous studies are unique to the B4DT program (Hansen *et al.*, 2018) or whether an intensive ERP program that is not based on the B4DT program can be equally effective. There is therefore a need to evaluate the short- and long-term outcomes for an intensive out-patient-based ERP therapy for OCD that could be applied to other small-scale clinical settings and to see how such an ERP intervention for OCD in a real-world setting compares with outcomes from previous research.

Aims and hypotheses

The aim of this study was to examine short- and long-term outcomes of an intensive time-limited psychological out-patient therapy intervention for patients suffering from obsessive compulsive disorder using concentrated exposure and response prevention therapy in an out-patient clinical psychology setting. We hypothesized that there would be a significant decrease in OCD severity and obsessive compulsive beliefs from baseline to the end of the program, with improvements maintained at the 6- and 12-month follow-up. We also hypothesized that the intervention would result in reliable and clinically significant improvements in OCD severity using international criteria for treatment response (Mataix-Cols *et al.*, 2016; Storch *et al.*, 2015).

Given the association between OCD, depression and emotion regulation difficulties (Manor and Yap, 2024; Yap *et al.*, 2012; Yap *et al.*, 2018), we also examined whether the treatment resulted in improvements to difficulties in emotion regulation and psychological distress (i.e. levels of depression, anxiety, and stress). Previous research has shown improvements in these factors following OCD treatment (Öst *et al.*, 2022; Wei *et al.*, 2020). We therefore hypothesized significant improvements at post-treatment and follow-up. We were particularly interested in evaluating outcomes in emotion regulation due to the possibility that it could drive changes in OCD. Although we do not have a large enough sample size to examine mediation,

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Table 1. Demographic information

		n	Percentage
Gender	Female	9	43%
	Male	12	57%
Ethnic background	Caucasian	19	91%
	Asian	2	9%
Education	Secondary	3	14%
	Tertiary	18	86%
Living arrangements	With family or partner	18	86%
	Shared	2	9%
	Alone	1	5%
Marital status	Married	9	43%
	Single	12	57%
Occupation	Full-time work	9	43%
	Part-time work	2	9%
	Student	6	29%
	Unemployed	4	19%

finding significant changes in emotion regulation following ERP would help justify future research to examine it as a process of change in OCD.

Method

Participants

Participants were 21 individuals with a diagnosis of obsessive compulsive disorder. Ages ranged from 19 to 52 years (mean age 32.76 years, $SD = 10.82$). See Table 1 for other demographic information. Inclusion and exclusion criteria were broad to reflect typical practice in an outpatient clinic. Participants were included if they had a primary diagnosis of OCD and were 18 years or older. Exclusion criteria included active psychosis, low-functioning autism, or poor motivation to engage with ERP. Participation in the study also required a referral from a treating doctor and completion of a satisfactory clinical review conducted by a clinician separate from the treating team. Only one presenting candidate for the study was excluded due to a lack of motivation and engagement at the time of presentation. Although the sample size was small, it was greater than the minimum sample size of 12 required to detect a large pre–post effect size with a statistical power of .80 and alpha of 0.05.

All participants had a primary diagnosis of OCD. Using the Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) checklist, aggressive obsessions were the most commonly reported obsession. However, most participants reported a mixture of OCD subtypes that included contamination concerns and other obsessions ($n = 14$). Contamination-only concerns were reported by two participants and obsessions-only concerns were reported by two participants. Mean baseline Y-BOCS score at baseline was 28.10 ($SD = 4.38$) and ranged from 19 to 39. Using the benchmarks of Storch *et al.* (2015), five participants had moderate symptoms, 15 had moderate–severe symptoms, and one participant had severe symptoms.

Although OCD was the primary presenting problem, all participants reported one or more psychiatric co-morbidities, including panic disorder ($n = 13$), depression ($n = 12$), generalized anxiety disorder ($n = 9$), post-traumatic stress disorder ($n = 5$), social anxiety ($n = 5$), body-focused repetitive behaviour ($n = 4$), hoarding disorder ($n = 2$), autism ($n = 2$), personality disorder/traits ($n = 2$), eating disorder ($n = 1$), body dysmorphic disorder ($n = 1$), attention deficit and hyperactivity disorder ($n = 1$), chronic fatigue syndrome ($n = 1$), and alcohol abuse ($n = 1$).

Most participants reported an onset of OCD in childhood ($n = 12$) and adolescence ($n = 7$). Adult onset occurred in two participants. Several participants reported trauma and stress-related triggers to the onset of OCD ($n = 12$).

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Measures

The following measures were administered to participants at all four time points: prior to the start of the program (Time 1), after the intensive therapy and supported phase (Time 2), at 6-month follow-up (Time 3) and at the 12-month follow-up (Time 4).

The Y-BOCS was used to assess severity of OCD (Goodman *et al.*, 1989). The Y-BOCS is a semi-structured interview that is made up of a 58-item checklist for OCD symptoms, followed by a 10-item clinician assessment for severity across both obsessive and compulsive subscales, where both frequency and intensity are assessed. Scores for the Y-BOCS range from 0 to 40. The Y-BOCS is widely used in research and clinical settings, and has excellent psychometric properties (Kuckertz *et al.*, 2021). In the current study, the internal consistency reliability of the measure over the four times points were very good and ranged from $\alpha = .81$ to .91.

The Depression, Anxiety and Stress Scales (DASS-21) measured the participants' levels of depression, and anxiety and stress across 21 items divided into three 7-item subscales (Lovibond and Lovibond, 1995). The depression subscale examines hopelessness, dysphoria and self-depreciation, the anxiety subscale examines the subjective response to situational anxiety, and the stress scale assesses chronic arousal and difficulty relaxing. The DASS-21 has excellent psychometric properties (Henry and Crawford, 2005) and the internal consistency reliability over the four time points in the current study for the subscales ranged from $\alpha = .85$ to .97.

The Difficulties in Emotion Regulation Scale (DERS) was used to screen for any challenges one might have regulating their emotions (Gratz and Roemer, 2004). The measure aims to gauge one's impulse control, engagement in goal-directed behaviour, reception of emotional responses, emotional awareness, emotion regulation strategies, and emotional clarity. Higher scores indicate greater difficulties in regulating emotions. We used the 16-item version (Bjureberg *et al.*, 2016) which has excellent psychometric properties. The internal consistency reliability across the four time points in the current study for the DERS ranged from $\alpha = .95$ to .99.

The Obsessive Beliefs Questionnaire (OBQ-20; Moulding *et al.*, 2023) is a 20-item self-report assessment that was used to measure obsessive beliefs related to OCD including over-importance of thoughts, over-estimation of threat, intolerance of uncertainty, and inflated responsibility for harm. Responses were rated on a 7-point Likert scale. The OBQ-20 has excellent psychometric properties (Moulding *et al.*, 2011) and the internal consistency reliability of the scale in the current study over the four time points ranged from $\alpha = .89$ to .96.

The Clinical Global Impression Scale (Guy, 1976; Busner and Targum, 2007) is a clinician-administered rating tool for the assessment of the severity of psychopathology (CGI-S) and the extent to which the patient had improved since the commencement of treatment (CGI-I). The clinician rates the CGI-S from 1 (normal, not at all ill) to 7 (among the most extremely ill patients) and the CGI-I from 1 (very much improved since the initiation of treatment) to 7 (very much worse since the initiation of treatment). In the current study, all patients were assessed with the CGI-S and CGI-I at Time 2, 3 and 4 by a clinician (J.M.) who was not involved in the treatment.

Procedure

Participants were patients referred to The Anxiety & OCD Clinic, Melbourne (https://theanxietyclinic.com/) by general practitioners or relevant medical specialists with a valid Mental Health Care Plan under the Medicare Australia Better Access to Mental Health program. Better Access is a government funded initiative that subsidizes psychological services for up to 10 individual sessions and 10 group sessions a year (Australian Government Department of Health and Aged Care, n.d.). This referral path is the same process that applies to all referrals to the clinic. The Anxiety & OCD Clinic is a private psychology practice with four mental health clinicians who are experienced in the treatment of anxiety and OCD (three psychologists and one mental health nurse). The clinic sees approximately 1800 patients a year; mostly adults who live in metropolitan

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Table 2. The Melbourne Intensive Treatment–OCD (MIT-O) program content summary

Day	09:30 to 11:30	11:45 to 13:15	14:15 to 16:15
Week 1 (day 1)	**Group:** Program introduction and overview, background to OCD, introduction to treatment model (anxiety, habituation, ERP)	**Individual:** Review of Y-BOCS, development of comprehensive list of cues, triggers, rituals, and avoidance behaviours	**Group:** Review of 'OCD Explained' **Individual:** Completion of triggers and hierarchy document, and selection of ERP tasks. ERP tasks and homework planning
Week 1 (day 2)	**Individual:** Review of OCD model and homework, demonstrate understanding of OCD model using personal examples. Coached ERP	**Group:** Symptom management strategies	**Individual:** Coached ERP and homework
Week 2 (day 3)	**Individual:** Review of OCD model and previous ERP homework	**Individual:** Coached ERP	**Individual:** Continued coached ERP sessions and preparation for the next set of ERP tasks
Week 2 (day 4)	**Individual:** Review of OCD model and reinforcement of ERP rationale, ERP	**Individual:** ERP	**Group:** Relapse prevention training, preparation for discharge

Melbourne. Demographic characteristics of the clinic's patient population are similar to the participants in the current study presented in Table 1.

The clinic was dedicated to the operations of the Melbourne Intensive Therapy–OCD (MIT-O) intervention over the 4 days of the intensive phase in a 2-week period. On other days, the clinic operated on its normal program. Treatment was partly funded by the Better Access Initiative and, for the current study, by a grant from the Psyche Foundation, which covered all participants' out-of-pocket costs.

All patients seeking treatment for OCD in the clinic were provided information about the MIT-O and a Plain English version of the evaluation project. Those who opted into the MIT-O program signed an informed consent form. They were invited to the clinical assessment phase conducted by a psychologist who was not involved in the treatment, which included a clinical interview, a diagnostic assessment using a semi-structured clinical interview schedule (SCID), and the clinician rating of clinical global functioning (CGI). OCD diagnoses were established at this initial assessment. Twenty-two people completed the process with only one not offered the treatment. This patient continued in CBT treatment within the clinic as they were deemed not ready for a short-term intensive treatment owing to low motivation, avoidant behaviours, and lack of insight. The remaining 21 participants were assigned to a therapist. Therapists worked with the same patient for the whole period, although there were some changes made following clinical reviews to enhance therapy process – improving motivation, assessing issues arising from the challenges.

The MIT-O program

There were four phases in the program: (1) assessment phase including baseline data collection and psychoeducation, (2) the intensive therapy phase which involved individually tailored treatment planning and coached ERP for two full days a week over 2 weeks equivalent to approximately 22 hours of treatment, (3) the 21-day supportive phase which involved self-administered ERP tasks, other behavioural tasks and relapse prevention exercises whereby patients had internet/telephone contact twice a week to review progress, and (4) the review phase which occurred at post-treatment, and follow-up intervals of 6 and 12 months utilizing a functional interview, Y-BOCS scores, treatment response data, and global impression of functioning. Table 2 is a description of the intensive therapy phase content and schedule (for a detailed description of the whole program, please see the Supplementary material).

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The intensive treatment was administered in-person in cohorts of three participants each. All patients within a cohort attended the treatment together at the same time. There was a total of seven cohorts. Owing to the COVID-19 pandemic and its impact on research and treatment, the project was more extended than expected, commencing in 2020 and concluding in 2023. One cohort completed the intensive and supported phases in March 2020, another four cohorts completed intensive and supported phases by December 2021, and the final two cohorts completed the intensive and supported phases by April 2022. The program was also modified to allow for telehealth delivery so that participants who were unable to attend due to a health reason during the COVID-19 pandemic could still do so via telehealth. Only one participant attended via telehealth and had outcomes similar to other patients.

Two psychologists and a mental health nurse were involved in the treatment team. They each had more than 15 years of applied experience in the management of OCD, and the design and application of exposure and response prevention protocols. The lead author provided supervision of all practitioners. The project clinicians and research staff met regularly weekly to coordinate the data management process. Clinical supervision was provided continuously and regularly in both peer group and individual settings throughout the project.

The program provided keys to reducing the control that intrusive unwanted thoughts exert, as well as ways of coping with the variety of compulsive and ruminative phenomena typical of OCD. It also included methods for restoring agency to the sufferer by teaching strategies such as detachment, psychological focusing and refocusing of attention, and other adaptive learning skills. Strategies to invalidate the negative experiences of being controlled and overwhelmed, to create new response pathways for clearer thinking, increasing affect management and behavioural engagement that can help reverse even the most trenchant OCD triggers. This OCD treatment was designed to reduce symptoms and facilitate strategic learning processes, utilizing the higher order cognitive functions highlighted by contemporary neuroscience. The model for change involved re-learning a repertoire of responses that are adaptive. This adaptive learning was strengthened by coached ERP at an intensity and pace appropriate to the subjective needs of the participant (please see Supplementary material for the program manual).

Data analysis

To examine the percentage of participants who showed clinically significant change in OCD severity, international consensus criteria from Mataix-Cols *et al.* (2016) were used. To examine improvement in outcomes across time, separate growth curves for the Y-BOCS, DASS subscales, OBQ-20 and DERS were examined using multi-level modelling in SPSS v29. Time was entered as the repeated measure. The fixed part of the model included the outcome variable as the dependent variable and time as the covariate. Linear and quadratic trends were examined. In the random part of the model, a random intercept and slope was included with a heterogenous first-order autoregressive structure to examine between-subject variation in time effects. Restricted maximum likelihood (REML) with Kenward-Roger approximation was used due to the small sample size.

Results

Treatment response

A total of 21 participants completed the treatment and all completed the Y-BOCS at pre- and post-treatment. However, several questionnaires were not completed by some participants at the 6- and 12-month follow-up time points.

Treatment response rates were calculated using the international consensus criteria for treatment response (Mataix-Cols *et al.*, 2016). The final CGI-I score was used and we compared Y-BOCS scores at pre-treatment with the last available Y-BOCS score. Treatment response was

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Table 3. Clinical global impression severity and improvement ratings, Y-BOCS scores, severity, and treatment response for all participants at the baseline and final assessment

ID	Final time point assessed	Final CGI-S	Final CGI-I	Baseline Y-BOCS	Final Y-BOCS	Clinical severity*	Treatment response**
1	12-month	3	2	24	16	Moderate	Partial
2	12-month	3	2	28	11	Mild	Remission
3	Post-treatment	4	3	23	21	Moderate	No response
4	12-month	3	1	29	8	Mild	Remission
5	12-month	3	1	19	10	Mild	Remission
6	12-month	4	3	30	19	Moderate	Partial
7	12-month	1	1	29	1	Mild	Remission
8	12-month	2	1	29	7	Mild	Remission
9	12-month	4	3	25	19	Moderate	No response
10	12-month	3	2	28	16	Moderate	Response
11	12-month	4	2	21	14	Moderate	Partial
12	12-month	3	1	28	14	Moderate	Response
13	12-month	3	2	27	18	Moderate	Partial
14	12-month	1	1	33	3	Mild	Remission
15	Post-treatment	4	3	29	17	Moderate	Partial
16	6-month	3	1	26	13	Mild	Response
17	12-month	4	2	32	19	Moderate	Response
18	6-month	2	1	39	6	Mild	Remission
19	Post-treatment	5	3	28	21	Moderate	Partial
20	Post-treatment	5	3	33	24	Moderate	Partial
21	6-month	4	2	30	16	Moderate	Response

Y-BOCS, Yale-Brown Obsessive Compulsive Scale. *Clinical severity at final assessment based on the benchmarks of Storch *et al.* (2015). **Treatment response criteria of Mataix-Cols *et al.* (2016<1>).

defined as ≥35% reduction on the Y-BOCS and a CGI-I of 1 or 2. Partial response was defined as between 25 and 35% reduction on the Y-BOCS, and a CGI-I ≤3. Remission was defined as ≥35% reduction on the Y-BOCS score, a Y-BOCS total score of 12 or less, and a CGI-I of ≤2.

Table 3 shows Y-BOCS scores, the Clinical Global Impression ratings of severity and improvement ratings, and indicators of severity and treatment response at the last available assessment for all 21 participants. For severity, we used the benchmark of Storch *et al.* (2015) to categorize the severity of OCD at the last available assessment (Y-BOCS scores ≤13 = mild, 14–25 = moderate, 26–34 = moderate-severe, and 35–40 = severe symptoms).

Results showed that one-third of participants ($n = 7$) showed treatment response and remission at the final assessment; slightly less than a quarter ($n = 5$) showed treatment response but still experienced residual symptoms; and a third ($n = 7$) showed partial response. Two participants failed to show any reliable change in OCD severity.

Change trajectories for every participant are shown in Fig. 1. Most participants showed a substantial decrease in their Y-BOCS score from pre- to post-treatment and further improvements or maintenance at follow-up.

Change over time

Table 4 shows the mean scores and standard deviations for the Y-BOCS and the other outcome variables across the four time points. There was a substantial amount of missing data for outcome variables with 14.3% missingness for the Y-BOCS, 21.4% for DASS, 22.6% for OBQ-20, and 23.8% for DERS scores. Little's MCAR test was not significant, $\chi^2 = 27.57$, d.f. = 18, $p = .07$, indicating that data were missing completely at random.

Growth models using multi-level modelling in SPSS v29 were used to examine whether there was a statistically significant change over time for all outcome variables (Field, 2017). An advantage of multi-level modelling over a repeated measures analysis of variance is the ability

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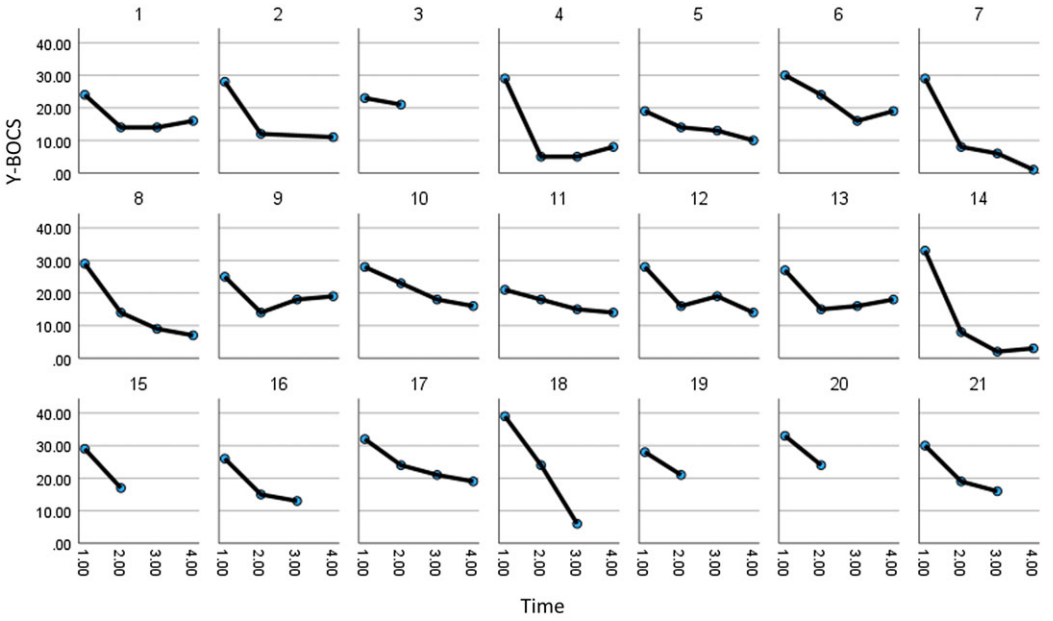

Figure 1. Y-BOCS scores over time for all 21 participants. Time 1, pre-treatment; Time 2, post-treatment; Time 3, 6-month follow-up; Time 4, 12-month follow-up;Y-BOCS, Yale-Brown Obsessive Compulsive Scale.

to handle missing values and examine non-linear trends. To calculate the growth models, outcome variables were entered as the dependent variable in separate models and time was entered as the covariate. Due to the small sample size, parameters were estimated using REML with the Kenward-Roger approximation (McNeish and Stapleton, 2016).

For each dependent variable, the linear effect of time was first examined. The likelihood ratio test (–2LL) was used to evaluate model fit and examine whether the inclusion of non-linear trends added to model fit. To allow for variation between individuals, random intercepts and slopes were included in the random effects model with an heterogenous autoregressive covariance structure. Results of growth modelling fixed effects are shown in Table 4.

Due to the lack of variation between individuals on change over time in the Y-BOCS, the model which included the random slope did not converge. We therefore only included the intercept in the random effects model with a scaled identity covariance structure. Results showed significant linear and quadratic fixed effects of time. Examination of means indicated improvements from pre- to the 6-month follow-up and no further change at the 12-month follow-up. Estimates of covariance parameters showed significant variance in the random intercept, $b = 9.52$, $SE = 4.80$, Wald $Z = 1.98$, $p = .048$, 95%CI [3.54, 25.58], indicating significant individual variation in the baseline Y-BOCS scores.

The mean difference in Y-BOCS scores between pre- and post-treatment was 11.43, 95% CI [8.72, 14.14] with a Cohen's d of 2.28, 95% CI [1.73, 2.83], indicating a very large effect of the treatment.

Depression, Anxiety, and Stress Scales

The growth model for anxiety showed no significant change in anxiety scores over time. The model which included the random slope did not converge and we therefore only included the random intercept. Estimates of covariance parameters showed significant variance in the random intercept, $b = 17.83$, $SE = 6.58$, Wald $Z = 2.71$, $p = .007$, 95% CI [8.65, 36.73], indicating significant individual variation in baseline anxiety scores.

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Table 4. Means, standard deviations (in parentheses), number of participants (*n*) for outcome measures over time, and fixed effects growth model results

	Outcomes across time					Growth model						
	Pre-	Post-	6-month	12-month	Parameter	*B*	*SE*	d.f.	*t*	*p*	95% CI	Model fit −2LL
Y-BOCS	28.10	16.67	12.94	12.50	Intercept	27.91	1.15	52.81	24.25	<.001	25.60, 30.22	431.92
	(4.38)	(5.67)	(5.66)	(6.00)	Time	—	1.58	50.82	−8.57	<.001	−6.47, −4.03	
	n = 21	*n* = 21	*n* = 16	*n* = 14	Time^2	13.58	0.52	51.08	5.56	<.001	1.85, 3.95	
						2.90						
ANX	7.24	6.26	5.29	3.83	Intercept	7.02	1.08	27.13	6.52	<.001	4.81, 9.22	367.96
	(5.13)	(5.41)	(5.76)	(3.95)	Time	−0.60	0.35	45.31	−1.75	= .09	−1.30, 0.09	
	n = 21	*n* = 19	*n* = 14	*n* = 12								
STR	11.29	8.84	7.36	7.08	Intercept	11.30	1.17	29.52	9.67	<.001	8.91, 13.69	368.76
	(5.32)	(6.06)	(5.06)	(4.62)	Time	−3.57	1.11	43.46	−3.22	= .002	−5.80, −1.33	
	n = 21	*n* = 19	*n* = 14	*n* = 12	Time^2	0.87	0.37	43.65	2.35	= .02	0.123, 1.62	
DEP	8.62	7.32	7.71	3.92	Intercept	8.42	1.65	19.68	5.10	<.001	4.97, 11.86	393.05
	(7.53)	(6.51)	(7.81)	(3.58)	Time	−0.45	0.52	18.91	-0.90	= .392	−1.54, 0.62	
	n = 21	*n* = 19	*n* = 14	*n* = 12								
OBQ-20	80.85	62.47	60.69	54.25	Intercept	81.63	6.13	22.16	13.32	<.001	68.93, 94.34	563.24
	(29.40)	(27.76)	(26.24)	(25.26)	Time	—	5.49	38.44	−3.53	= .001	−30.48, −8.25	
	n = 20	*n* = 17	*n* = 16	*n* = 12	Time^2	19.36	1.84	35.46	2.39	= .02	0.67, 8.12	
						4.40						
DERS	44.15	36.94	35.75	32.17	Intercept	43.47	4.29	18.12	10.13	<.011	34.46, 52.48	513.04
	(18.53)	(21.64)	(16.36)	(12.69)	Time	−3.57	1.35	17.24	−2.64	= .02	−6.42, −0.72	
	n = 20	*n* = 16	*n* = 16	*n* = 12								

Y-BOCS, Yale Brown Obsessive-Compulsive Scale; ANX, Anxiety; STR, Stress; DEP, Depression. ANX, STR and DEP are subscales from the Depression, Anxiety, Stress Scales 21-item version; OBQ-20, Obsessive Beliefs Questionnaire; DERS, Difficulties in Emotion Regulation Scale. *OCD severity.*

Growth modelling results for change in stress over time showed significant linear and quadratic trends indicating change from pre-treatment to the 6-month follow-up and no further change at the 12-month follow-up. The model with the random slope also did not converge and only the random intercept was included. Estimates of covariance parameters showed significant variance in the random intercept, $b = 20.48$, $SE = 7.41$, Wald $Z = 2.77$, $p = .006$, 95% CI [10.08, 41.60]. Although the growth model indicates change in stress over time, the mean difference between pre- and post-treatment was 2.45 (95% CI: –1.36 to 6.26) with a small to moderate effect size (Cohen's $d = 0.43$, 95% CI: –0.24 to 1.10) which may not be significant.

Results showed no significant change in depression over time. The random slopes were also not significant, $b = 2.66$, $SE = 1.68$, Wald $Z = 1.59$, $p = 0.11$, 95% CI [0.775, 9.09] but there was a significant variance in the random intercept, $b = 50.79$, $SE = 18.25$, Wald $Z = 2.78$, $p = .005$, 95% CI [25.11, 102.72].

Obsessive beliefs

There were significant linear and quadratic fixed effects for the OBQ-20 over time, indicating improvements from pre- to post-treatment which stabilized over the follow-up time points. The random slopes were not significant, $b = 19.80$, $SE = 24.07$, Wald $Z = 0.82$, $p = .41$, 95% CI [1.83, 214.52] but the random intercept was significant, $b = 591.77$, $SE = 236.24$, Wald $Z = 2.51$, $p = .01$, 95% CI [270.61, 1294.06]. The mean difference in OBQ-20 scores between pre- and post-treatment was 18.38, 95% CI [5.07, 31.69] with a Cohen's d of 0.92, 95% CI [0.23 to 1.61], indicating a large effect of the treatment on obsessive beliefs.

Difficulties in Emotion Regulation

Results showed a significant fixed linear effect of time for the DERS indicating ongoing improvements over time from pre-treatment to the 12-month follow-up. There was no significant random slope, $b = 4.53$, $SE = 0.80$, Wald $Z = -1.08$, $p = 0.28$, 95% CI [0.03, 694.30]. There was, however, a significant random intercept, $b = 291.32$, $SE = 125.96$, Wald $Z = 2.31$, $p = .02$, 95% CI [124.83, 679.84]. The mean difference in DERS scores between pre- and post-treatment was 7.21, 95% CI [–6.64, 21.06] with a Cohen's d of 0.36, 95% CI [–6.64, 21.06], indicating a small to moderate effect which may not be significant.

Discussion

The findings showed sound support for the effectiveness of the Melbourne Intensive Therapy-OCD (MIT-O) program. There was a significant decrease in OCD severity from pre- to post-treatment with a very large effect and maintenance of treatment effects over 12 months. By the final assessment, almost all participants (90.5%) had a least a partial response to treatment and more than half showed full treatment response or better (57.1%).

The overall change in Y-BOCS scores in our study was comparable to out-patient treatment outcomes for OCD. In the benchmarking study of Houghton *et al.* (2010) of Sheffield NHS Psychotherapy Service's routinely delivered CBT treatment for OCD, patients had an average pre- to post-treatment reduction of 10.2 on the Y-BOCS, which was similar to the overall pre- to post-treatment mean difference of 11.4 for ERP RCTs used by Houghton *et al.* (2010) for benchmarking. The average Y-BOCS reduction in the MIT-O program was also 11.4. Houghton *et al.* (2010) also reported that 37% of their patients made clinically significant and reliable change at post-treatment, which was slightly higher but similar to our 12-month remission rate of 33%.

The effect size of the MIT-O pre- to post-treatment effects ($d = 2.28$) was also comparable to the systematic review of Öst *et al.* (2022) of studies examining OCD treatment outcomes for CBT in routine clinical care, which found a large pooled pre–post treatment effect size in Y-BOCS

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($d = 2.12$). However, our 12-month remission rate of 33% was much lower than their average follow-up remission rate of 57%.

It is possible that lower remission rates may have been due to the heterogenous clinical presentations in our sample and the impact of the pandemic. The biggest shift in the Y-BOCS scores occurred between Times 1 and 2 that corresponded with the intensive and supported phases of treatment. In addition, Fig. 1 which presents a visual analogue of individual Y-BOCS scores of all participants over the pre-, post-, 6-month and 12-month time period suggests that the learning of new responses was established in the early phases of the program when 1-to-1 therapy was provided, whether individually or remotely.

This is consistent with growth models presented in Table 4 where the shape of the trajectories showed evidence of initial dramatic falls that flatten out in some variables. Examination of other means showed improvement from pre-treatment to the 6-month follow-up and no further change at the 12-month follow-up. The OBQ-20 scores also showed a significant shift in the obsessional beliefs from pre- to post-treatment that then flattened out over time, which reaffirms the important role that cognitive appraisals play in treatment and supports the cognitive behavioural model of OCD.

There was, however, no shift in scores for anxiety or depression. Although there was some shift in stress levels, the pre- to post-treatment mean difference was not statistically significant. This may be due to the relatively low baseline levels of DASS scores in this sample. Owing to the small sample size, it was not possible to calculate predictors of change. What can be said is that the improvements in the Y-BOCS scores in this sample were not dependent on changes in mood or anxiety.

Importantly, although the treatment outcomes of the MIT-O program were positive, they were not as large as those reported for the B4DT program. The pre- to post-treatment Y-BOCS scores reported by Hansen *et al.* (2018) showed very large effects ($d = 3.35$) and the 12-month follow-up remission rate was 67.7%. This indicates that there may be other components in the B4DT program that enhance treatment outcomes beyond just concentrated ERPs.

Finally, while we did see some small change in emotion regulation over time, the pre- to post-treatment mean difference was not statistically significant. This finding is inconsistent with previous research showing improvements in emotion regulation following ERP (Wei *et al.*, 2020). However, Wei *et al.* (2020) also found small effects of treatment on emotion regulation, indicating that our finding may be due to our small sample size. These small effects indicate that ERP may not necessarily lead to improvements in emotion regulation and that future research on improving emotion regulation strategies in ERP may be required.

Treatment implications

The MIT-O program was delivered in an applied clinical setting that can be adapted to single-practice and multiple-practice mental health clinics. Programs of this nature are more likely to be implemented in the context of collaboration between clinicians, government bodies and philanthropic foundations committed to evidence-based mental health treatments. Regrettably, in the Australian health delivery context, the government funding for psychological treatments is strictly limited to capped sessions of individual and group therapy totaling 20 sessions a year. There are other health program delivery systems where private funding and government funding provide treatment without heavy out-of-pocket costs to participants. This is a clear gap in service provision for the mentally ill.

The MIT-O treatment manual was provided to support both patients and the therapists throughout the treatment process (see Supplementary material). Providing each patient with a detailed treatment workbook enhanced the learning and change experiences, provided revision steps when setbacks occurred, and a collaborative reference point in the process of self-learning as the intensive coaching phase moved to more independent and consultative phases. The continuous clinical reviews of participant experience by our research psychologist (not one of the therapists) provided a feedback loop from the participants regarding their OCD symptomatology

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and their personal reflection on their response to treatment. This was very important in the context of being able to develop new responses to the specific experiences of OCD symptoms in a personalized therapy. In broad terms, the MIT-O program provided outcomes that are consistent with and confirmatory of the consensus-based outcome practices from Mataix-Cols *et al.* (2016) and the dataset produced by Storch *et al.* (2015) who set benchmarks for assessing outcomes and treatment planning for OCD.

Limitations and future research

The current study provided positive evidence for the effectiveness of a concentrated exposure therapy in an out-patient setting. It is our view that this therapy format has the potential to lessen disruptions to family and work life for some individuals, as it avoids the extended duration associated with treatments that span weeks or months and require in-patient admissions or being away from home. However, we did not conduct any client feedback or qualitative interviews. It is equally likely that the intensive nature of the program may be less feasible for some patients, with its requirement for full days of participation, and may pose challenges particularly in terms of taking time off work or managing other commitments. Further research, including patient qualitative feedback, is needed to better understand the range of experiences regarding these disruptions. Furthermore, qualitive research to examine ways of improving program implementation could lead to better outcomes (Waite *et al.*, 2023).

There are also other notable limitations that should be considered when interpreting the findings. The small sample size of the study reduced the statistical power of the study, limited the generalizability of the results and increased the potential for sampling bias. The small sample size also prevented an examination of moderators of treatment outcomes. For example, patients with certain OCD subtypes or co-morbidities may be less responsive to intensive treatment but we were unable to examine this. Another important limitation is the lack of a comparison group. We therefore cannot confirm if the outcomes were completely attributable to the intervention. Nevertheless, previous research has shown that the placebo response in OCD is weak (Sugarman *et al.*, 2017); it is likely that the large effects were due to the MIT-O program.

The study also did not include an assessment of cost-effectiveness, which is crucial for determining the economic feasibility and sustainability of implementing the intervention in real-world settings. Additionally, the lack of evaluations related to quality-of-life outcomes means that the broader impacts of the intervention on participants' well-being, beyond clinical measures, remain unexplored. Addressing these limitations in future research, especially in comparing the effectiveness of ERP in different formats with patients who have similar baseline OCD severity, would provide more robust evidence and a comprehensive understanding of the intervention's overall impact.

Another limitation was the lack of an assessment of treatment fidelity or feasibility. We did not seek permission to record sessions to rate treatment fidelity because we were concerned that recording of sessions would be too intrusive. We therefore could not verify if the intervention was delivered consistently across therapists and cohorts. We also did not interview participants or therapists to evaluate the feasibility of the program. Future research should use client and therapist self-reports, and independent observer checklists to evaluate treatment fidelity and feasibility. As the MIT-O was conducted in a group practice with four clinicians, it would be important to evaluate if such intensive programs can be delivered by stand-alone practitioners.

As noted, although MIT-O was effective, the treatment response rates were lower than those reported for the B4DT program (Hansen *et al.*, 2018; Kvale *et al.*, 2018; Skjold *et al.*, 2024). The therapy delivery model for the MIT-O focused on ERP, which was conducted mostly 1-to-1 with only a few group interactions that were psychoeducational in format. By contrast, the B4DT program's practice of regular brief check-ins as a team (patients, therapists, supervisors), providing individual treatment in a group context, might have enhanced the learning experiences of ERP. For example, mirror effects when reflecting on content and experiences during exposures

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were discussed, memory consolidating and re-consolidating involved both in self-reporting and listening to other ERP experiences. Furthermore, feedback from therapists and supervisors introduces the possibility of enhancing motivation, increasing awareness, or tweaking of exposure and response prevention delivery to create a different outcome. It is possible that this collaborative process might be enhanced by reinforcing 1-to-1 and group sessions where the subjective experiences of exposure and response prevention are shared within either group or dyadic settings. Future research should evaluate the value of combining 1-to-1 and group psychotherapeutic interactions in intensive ERP for OCD. There may be other B4DT content and processes that are different from the MIT-O program. Further research comparing specific processes will help in examining which specific processes lead to better outcomes.

Further research into outcomes in bigger samples might also clarify differential responses from patients whose change experiences arise from either the habituation of their affective reactions or new learning that enabled greater distress tolerance for anxiety and uncertainty increasing functionality, or a combination of both in subjective response sets. This would guide future management plans for non-responders who might require supplementary treatment over a longer time, a more structured setting or indeed repetitions of the short-form therapy.

Finally, although there is consensus that ERP is the psychological treatment of choice for OCD (Öst *et al.*, 2022), the delivery of ERP in real-world settings can vary between clinicians depending on their training and preferences, be they cognitive and/or behavioural, mindfulness-based, compassion-focused, narrative, or psychodynamic, to name just a few. Clinicians also vary the delivery of ERP based on client presentations and case formulations, as the condition is so variable in symptom presentation and co-morbidities. Whilst our study provides evidence that brief intensive ERP in a real-world out-patient setting is effective, it does not inform clinicians on how best to tailor ERP. Further research that focuses on individual change processes using idionomic methods may be useful to clinicians for the tailoring of ERP (Ciarrochi *et al.*, 2022). Research insights in memory consolidation and re-consolidation, neuroplasticity and adaptive learning may also be important in understanding the change processes in OCD treatments. Change processes may be more than just the appraisals made and could also include the internalizing of the emotional experiences in various ways – fear, disgust, discordance, body-focused phenomena. Understanding the subjective experiential process in treatment would support the development of carefully planned individually formulated treatments.

Conclusion

This study aimed to evaluate the outcomes of an intensive, short-form treatment program for OCD in a private practice out-patient setting. Participants showed significant improvements in OCD severity and obsessive compulsive beliefs from baseline to the end of the program that were maintained at the 6- and 12-month follow-up. These results are consistent with the growing body of evidence for intensive ERP and provide hope for OCD patients who cannot access intensive ERP in residential settings. However, while the outcomes were positive, the effects were not as strong as those reported for the B4DT program, and our 12-month remission rates were low. We recommend further research into the essential components of this and other intensive programs such as the B4DT program to further enhance the delivery of concentrated ERP.

Key practice points

(1) Concentrated exposure and response prevention (ERP) delivered in an intensive out-patient format is an effective treatment for OCD.
(2) 90.5% experienced at least partial treatment response, and about one-third of participants were in remission at the final assessment.
(3) The findings suggest that intensive out-patient delivery of concentrated ERP can be a viable alternative to in-patient OCD treatment formats or traditional weekly out-patient sessions.

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Further reading

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Supplementary material. To view supplementary material for this article, please visit https://doi.org/10.1017/S1754470X2500008X

Data availability statement. The data that support the findings of this study are available on request from the first author, C.M.

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Author contributions. **Chris Mogan:** Conceptualization-Lead, Data curation-Equal, Funding acquisition-Lead, Investigation-Lead, Methodology-Equal, Project administration-Lead, Resources-Lead, Supervision-Equal, Writing - original draft-Equal, Writing - review & editing-Equal; **Julie Mogan:** Conceptualization-Equal, Investigation-Supporting, Project administration-Equal; **Elham Foroughi:** Conceptualization-Supporting, Investigation-Supporting, Writing - review & editing-Equal; **Kerryn Addison:** Data curation-Equal, Investigation-Supporting, Project administration-Supporting; **James Bryan:** Writing - original draft-Equal, Writing - review & editing-Equal; **Kim Felmingham:** Conceptualization-Supporting; **Keong Yap:** Conceptualization-Supporting, Formal analysis-Lead, Methodology-Equal, Supervision-Equal, Visualization-Lead, Writing - original draft-Equal, Writing - review & editing-Equal.

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Competing interests. Dr Christopher Mogan is the director of The Anxiety & OCD Clinic where this study was conducted. There are no other competing interests.

Ethical standard. Ethical approval was granted by the University of Melbourne Human Research Ethics Committee (Ethics ID 195427.1/2). All participants provided informed consent before participating. The research has conformed to the Declaration of Helsinki.

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