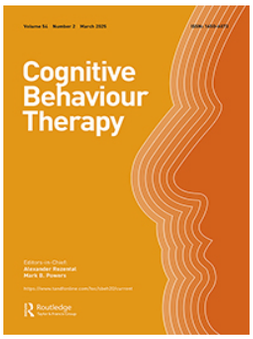

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A concentrated approach for treating OCD: a pilot study examining the feasibility and potential effectiveness of the Bergen Four Day Treatment in the U.S.

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ABSTRACT

The Bergen Four Day Treatment (B4DT) is a concentrated treatment for OCD that has demonstrated promising effectiveness in Nordic country samples. The B4DT is delivered over four days and provides individual treatment in a group context. The effectiveness of the B4DT for OCD has not been tested outside Nordic countries. The current pilot study evaluated the feasibility and the potential effectiveness of B4DT in a different culture and health-care system in the United States. Findings from 48 adults with OCD who completed the B4DT indicated that OCD, anxiety, and depression symptom severity significantly decreased from pre- to post-treatment, and gains were maintained at six month follow-up. The Yale-Brown Obsessive Compulsive Scale scores were reduced from moderate to subclinical; specifically, the average scores of 27.0 (pre-treatment) fell to 11.7 (post-treatment), 12.7 (3-month follow-up), and 13.7 (6-month follow-up). The B4DT was rated as highly acceptable by the US patients. Over 95% of the patients stated that they would recommend the treatment to a friend. These findings provide the first preliminary evidence for the generalizability of the B4DT to patients outside Nordic countries. Cultural and context-dependent issues that affected this dissemination pilot study are discussed in addition to future clinical and research directions.

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B4DT; OCD; ERP; concentrated treatment; pilot study

Obsessive-compulsive disorder (OCD) affects approximately 1% to 2% of people across the lifespan, more specifically in a recent meta-analysis, Fawcett et al. (2020) reported current prevalence estimates at 1.1% and lifetime at 1.3%. When not adequately treated, OCD is a chronic condition that results in a poor quality of life (Swain & Behura, 2016) and is associated with significant functional impairment (Abramowitz & Jacoby, 2015).

Exposure and Response Prevention (ERP) is recommended as the frontline intervention for OCD due to the body of evidence supporting its efficacy. Results from several comprehensive meta-analyses of randomized controlled trials suggest that individual

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ERP outperforms control conditions, including waitlist control, psychological placebo, and pill placebo groups, when examining reductions in OCD symptom severity (e.g. Olatunji et al., 2013; Öst et al., 2015). Group formats of ERP have also demonstrated effectiveness for reducing OCD symptom severity (Jónsson & Hougaard, 2009) and providing more efficient strategies for treating OCD when single therapists are able to provide cost-effective and proven treatments to more patients.

Although data support the efficacy of ERP for reducing symptoms of OCD, a subset of patients who receive the recommended dose of ERP do not experience clinically significant improvement.

These results underscore the need to examine treatment approaches that build off of the success of individual and group ERP models to improve the effectiveness of ERP. A contemporary model, the Bergen Four Day Treatment (B4DT), is a concentrated format of ERP that has shown promising results in Norwegian (e.g., Havnen et al., 2017; Launes, Laukvik, et al., 2019) and Icelandic (Davíðsdóttir et al., 2019) patients with OCD.

The B4DT was designed to maximize the effectiveness of ERP for OCD by combining the critical components of individual and group-based treatment models (Havnen et al., 2014). Evidence suggests that the effects of ERP for reducing OCD and anxiety symptoms are greater within individual therapy as compared with group therapy (Fisher & Wells, 2005). Individualized treatment plans, one-on-one support from a clinician, and beginning exposure trials sooner in treatment are all theorized to account for the increased effectiveness of individual ERP compared to group formats. However, group modalities have been shown to increase client motivation and adherence due to modeling and support from peers (Håland et al., 2010), which are common barriers to successful individual treatment for OCD (Simpson et al., 2010; Taylor et al., 2012; Vogel et al., 2006). Thus, the OCD treatment team in Bergen, Norway hypothesized that conducting ERP with a group of therapist–patient dyads (i.e., individual treatment in group context) may increase the effectiveness of the treatment overall due to integrating the strengths of both approaches (Havnen et al., 2013, 2014).

Findings also indicate that condensing the delivery of ERP might play a role in maximizing the effectiveness of ERP for decreasing fear and anxiety. For example, nearly 30 studies have demonstrated significant reductions in fear related to specific phobias following a single, 3-hour therapist-assisted ERP session (e.g., Haukebø et al., 2008; Öst et al., 2001; Vika et al., 2009). Given the chronic nature of OCD and its impact on psychosocial functioning, decreasing the duration of treatment while also increasing the clinical effects of ERP for OCD is desirable for patients and decreases the burden on systems of care. Thus, the B4DT was designed to examine the effectiveness of a concentrated model of ERP for OCD (Havnen et al., 2013, 2014).

Several open trials and one randomized controlled trial provide promising evidence for the effectiveness of the concentrated Bergen Four Day Treatment for targeting OCD, depression, and anxiety symptoms and improving psychosocial functioning (Hansen et al., 2019; Havnen et al., 2014; Kvale et al., 2020; Launes, Laukvik, et al., 2019). These improvements are maintained up to four years after treatment (Hansen et al., 2018, 2019). Furthermore, an RCT, although with a relatively low sample size, found that the B4DT outperformed self-help CBT and waitlist control conditions for improving

symptoms of OCD, depression, and anxiety and increasing occupational and social functioning (Launes, Hagen, et al., 2019).

Preliminary data also suggest that the therapeutic effects of the Bergen Four Day Treatment extend beyond the treatment team in Bergen, Norway. These include a study conducted in Oslo with 90 OCD patients (Kvale et al., 2018) and another study conducted in Sørlandet Hospital in Norway with 35 OCD patients (Launes, Laukvik, et al., 2019) reported effect sizes in comparable ranges with studies conducted in Bergen (Hansen et al., 2018; Havnen et al., 2014). Similarly, a study conducted in Iceland found that the Bergen Four Day Treatment produced clinically and statistically significant reductions in OCD symptom severity (Davíðsdóttir et al., 2019). These two studies provide support for the hypothesis that the effectiveness of this treatment model generalizes beyond Norwegian culture and the Bergen OCD treatment team. However, additional research studies are necessary to determine if OCD patients from other cultural groups and geographic regions would benefit from the Bergen Four Day Treatment and perceive this novel treatment as acceptable. Furthermore, it remains uncertain if clinicians in the US can effectively deliver the Bergen Four Day Treatment or if they will in fact find it acceptable and embrace it as clinicians in Norway and Iceland have.

Therefore, the primary aim of the current study was to assess the feasibility and acceptability of the Bergen Four Day Treatment among patients with OCD in the United States. This included evaluating therapists' and patients' perceptions of the concentrated treatment format. The secondary aim of the study, given that this was an open trial, is the assessment of the potential effectiveness, specifically in terms of clinical and statistical changes in OCD, anxiety, and depression symptom severity from pre-treatment to post-treatment. Consistent with findings from Norway (Havnen et al., 2014, 2017; Kvale et al., 2020; Launes et al., 2020; Launes, Hagen, et al., 2019; Launes, Laukvik, et al., 2019), it was hypothesized that patients would show reductions in symptom severity, which would be maintained through 6 months. Additionally, it was anticipated that improvements in psychosocial functioning reported from pre- to post-treatment would be sustained at 6 months. Furthermore, high ratings in acceptability and preliminary indications of effectiveness were expected from both patients and clinicians regarding the treatment.

Method

Participants

Participants were 48 adult patients experiencing moderate OCD symptoms using the empirically based Y-BOCS benchmark (see, Cervin et al., 2022). Individuals were excluded from the study if they did not meet diagnostic criteria for OCD based on Diagnostic and Statistical Manual of Mental Disorders (5th ed.; **DSM–5**; American Psychiatric Association, 2013) criteria, were younger than 18 years, or lived more than 2 hour (driving distance) from the treatment site (to ensure home visits were possible during treatment). The average age of patients was 36.8 year old (SD = 10.5). Slightly more than half the sample identified as female and one participant (2.1%) identified as gender non-binary. The sample was largely non-Hispanic white, college educated,

Table 1. Demographics and diagnosis composition of the sample.

Variable	Mean Age (*SD*)
Age of OCD Onset	13.3 (7.5)
Age of First Mental Health Treatment	22.3 (9.2)
Age at Beginning of Treatment	36.8 (10.5)
Gender Identity	Percentages/(n)
- Female	52.1 (25)
- Male	45.8 (22)
- Gender Non-binary	2.08 (1)
Racial/Ethnic Identity	
- Caucasian/White	60.4 (29)
- Hispanic/Latinx	20.8 (10)
- Asian	8.3 (4)
- Native American/Pacific Islander	4.2 (2)
- African American/Black	2.1 (1)
- Other Racial/Ethnic Groups	4.2 (2)
Single/Never married	50.0 (24)
1 or more child(ren)	35.4 (17)
Bachelor's degree	62.5 (30)
Employed full time	58.3 (28)
DSM-5 Diagnoses	
- Obsessive Compulsive Disorder	100 (48)
- Generalized Anxiety Disorder	41.7 (20)
- Major Depressive Disorder	33.3 (16)
- PTSD	10.4 (5)
- Social Anxiety Disorder	8.3 (4)
- Panic Disorder	6.3 (3)
- Persistent Depressive Disorder	4.2 (2)
- Agoraphobia	2.1 (1)
- Substance Use Disorder	2.1 (1)

employed, and without children. The average age of onset for OCD symptoms was around 13 years, and the average lag between symptom onset and first mental health treatment was approximately 10 years later. Almost two-thirds of the sample endorsed being on at least one medication trial for OCD. Patients in the current sample reported being hospitalized for psychiatric symptoms 1.9 times ($SD = 0.3$) in their lifetime. While the entire sample met diagnostic criteria for OCD, a majority also met criteria for at least one other psychiatric disorder. See Table 1 for a summary of the demographic statistic and the diagnostic makeup of the sample.

Measures

The miniature international neuropsychiatric interview (MINI; Sheehan et al., 1998). The MINI is a brief diagnostic semi-structured interview. The MINI has demonstrated convergent validity with other common interviews of psychological disorders (Lecrubier et al., 1997). Furthermore, the MINI has acceptable inter-rater and test–retest reliability (Lecrubier et al., 1997; Sheehan et al., 1998). The MINI was administered by a licensed clinical psychologist or a research assistant trained and supervised by a licensed clinical psychologist.

Yale brown obsessive compulsive scale: clinician version (YBOCS; Goodman et al., 1989). The YBOCS is the gold-standard instrument for assessing OCD symptom severity. The YBOCS is comprised of 10 items that assess the severity of obsessions (5 items) and

compulsions (5 items). Items are rated from 0 (*experiencing no symptoms*) to 4 (*experiencing extreme symptoms*). Total YBOCS scores are computed by summing all items and higher scores indicate greater OCD symptom severity. Using empirically derived benchmarks, the scores are arranged into different severity OCD ratings. Scores of (0–13) subclinical, (14–21) mild, (22–29) mc and (30–40) severe (Cervin et al., 2022). The YBOCS has shown excellent inter-rater and test–retest reliability, as well as convergent validity with other measures of OCD (Deacon & Abramowitz, 2005; Goodman et al., 1989). The YBOCS demonstrated acceptable to excellent internal consistency in the current sample, α's = 0.76–0.97.

Dimensional obsessive-compulsive scale: short form (DOCS-SF; Eilertsen et al., 2017). The DOCS-SF is a 5-item self-report measure of OCD symptom severity. Patients rate items on an 8-point Likert type scale from 0 (*None*) to 8 (*Extreme*). The total scores ranges from 0 to 40 with higher scores indicating more severe OCD symptoms. The DOCS-SF has demonstrated convergent validity compared to other measures of OCD symptom severity, as well as divergent validity from other psychological constructs (Eilertsen et al., 2017). The DOCS-SF has also demonstrated sound reliability over time (Eilertsen et al., 2017). Estimates of the internal consistency on the DOCS-SF within the current sample ranged from good to excellent, α's = 0.82–0.95.

Generalized anxiety disorde-7 (GAD-7; Spitzer et al., 2006). The GAD-7 is a 7-item, self-report measure of anxiety symptoms. Patients indicate the frequency of anxiety symptoms in the last week on a 4-point Likert scale from 0 (*not at all*) to 3 (*nearly every day*) for seven questions. The total scores range from 0 to 21 with greater scores indicating more severe anxiety symptom severity. The GAD-7 has demonstrated good validity and reliability in a clinical sample (Kertz et al., 2013). The internal consistency within our study was excellent across time points, αs = .90–.95.

Patient health questionnaire-9 (PHQ-9; Kroenke et al., 2010). The PHQ-9 is a 10-item self-reported measure of depression. Patients indicated the frequency of depression symptoms over the last week on a 4-point Likert scale ranging from 0 (*not at all*) to 3 (*nearly every day*). Total scores range from 0 to 30 with higher scores indicating greater depression symptom severity. The PHQ-9 has demonstrated adequate psychometric properties (Kroenke et al., 2010). Chronbach's αs for the PHQ-9 in the current sample ranged from 0.88 to 0.91, indicating good to excellent internal consistency.

Work and social adjustment scale (WSAS; Mundt et al., 2002). The WSAS is a self-report measure of functional impairment across five categories (i.e., ability to work, home management, social leisure activities, private leisure activities, and close relationships). Patients respond on a 9-point Likert scale from 0 (*not at all impairing*) to 8 (*very severely impaired*). Total scores are calculated by summing individual items with scores ranging from 0 to 40. Higher scores indicate greater functional impairment. The WSAS has demonstrated consistent reliability and validity (Jansson-Fröjmark, 2014; Mundt et al., 2002). Chronbach's α estimates ranged from 0.78 to 0.88 in the current study, suggesting acceptable to good internal consistency.

Client satisfaction questionnaire 8 (CSQ-8; Larsen et al., 1979). The CSQ-8 is an eight-item self-report measure of satisfaction with treatment. Participants respond on a 4-point Likert scale from 1 (very low satisfaction) to 4 (very high satisfaction). The total scores range from 8 to 32 with the higher scores indicating greater overall satisfaction with

treatment (Larsen et al., 1979). Psychometric properties published to date indicate that the CSQ-8 is a reliable instrument and demonstrates construct and convergent validity (Larsen et al., 1979). Chronbach's α estimate for the CSQ-8 was 0.88 indicating acceptable internal consistency in the current study.

Procedure

Recruitment

Patients were recruited via the OCD Institute of Texas (formerly, during the study period, Houston OCD Program) online advertisement platform and were also referred from other local providers who were informed about the study. Interested individuals completed an online screening survey consisting of a some basic demographic questionnaire, including age and sex, if they lived in the greater Houston area, if they believed they had OCD and a self-rated version of Yale-Brown Obsessive Compulsive Scale (Y-BOCS Self-rated; see Hauschild et al., 2019). Eligible patients (patients living in the greater Houston area and those who stated they had OCD) were then contacted to schedule an in-person assessment with a licensed clinical psychologist. A 30-min initial assessment was conducted to determine a diagnosis of OCD, to provide information about of the study, and treatment approach. Inclusion criteria included: aged 18 years or more, capable of receiving outpatient treatment and living within a two-hour drive of the treatment center, and fluent in English. Exclusionary criteria included the following: (1) ongoing substance abuse/dependence, (2) bipolar disorder or psychosis, (3) active suicidal ideation, and (4) intellectual disability (based on previous medical history). If deemed eligible, patients were scheduled for a follow-up assessment. If patients were not appropriate for the current study, they were provided with appropriate treatment referrals. During the second assessment, clinicians administered the YBOCS to evaluate OCD symptom severity and the MINI to determine the presence of co-occurring conditions.

Study procedure

Upon qualification, patients' names were added to a waitlist. Patients were contacted by a research assistant and offered treatment in one of the next three scheduled groups. Patients were reminded that treatment would be conducted over four consecutive days and to plan accordingly for work, childcare, and other responsibilities. The treatment was completely free of charge to the patient (sponsored by the Peace of Mind Foundation). This may or may not have influenced patient commitment to the treatment engagement as compared to having to pay for the treatment outright. A week prior to treatment, patients attended a 30-min virtual meeting with the lead clinician of their group to establish rapport and provide information on treatment expectations and logistics. At the end of the meeting, patients were asked to make a list of potential exposures (i.e., those things that were difficult to do because of OCD), which would be used as a basis for treatment planning on the first day of treatment. Patients were provided with a link to a self-report survey via email that they completed prior to the first day of treatment. At the onset of treatment, the patients completed clinician-administered YBOCS. Patients also completed brief measures evaluating symptoms of OCD, depression, and anxiety

after days 2–4 of treatment. Ten days after beginning treatment, patients completed the clinician-administered YBOCS over the phone with a clinician who did not provide the treatment, as well as a battery of self-report measures. Follow-up assessments (also conducted with a clinician who did not provide the treatment), including self-report measures and clinician-administered YBOCS, were repeated at three- and six-months post-treatment.

Treatment

The Bergen Four Day Treatment is conducted in a group format with 4–6 patients per group and at least as many therapists as patients (i.e., some groups included clinicians learning the treatment who were primarily in a shadowing role; no group had fewer B4DT trained clinicians than the number of patients attending the group). All psychoeducational material for both patients and families used during the 4 days was translated from Norwegian to English. A team of English and Norwegian-speaking therapists reviewed the translation before it was used. The same team of experts deemed that given the nature of the treatment content, no cultural adaptation of the text was needed; simply a straightforward translation to English was conducted. One clinician is designated as the group leader and is responsible for providing psychoeducation, leading group check-ins and providing feedback to the other clinicians during treatment team meetings. All clinicians were present for the entirety of the treatment. The group was comprised of four treatment days, 4 to 8 hours long.

During **Day 1**, patients were provided with psychoeducation about the development and maintenance of OCD and the rationale for the exposure-based treatment approach. The "LEan into The anxiety" (LET) technique was also demonstrated as a model for how to engage in exposures most effectively. Briefly, the LET-technique focuses on teaching the patients to actively approach whatever elicits the relevant anxiety or discomfort, and to help them systematically use the cues from those triggers to lean into the anxiety and discomfort (LET-technique) instead of employing obvious or subtle avoidance. The focus is on doing small exposures effectively with the patient fully leaning into the anxiety, not holding back, having identified and addressed the obvious or subtle avoidance as much as possible prior to conducting the exposure (for more on LET-technique, see Kvale et al., 2018). At the end of Day 1, patients shared their prepared lists of potentially useful exposures aloud with the group. Clinicians helped frame tasks into exposures (as needed) and collaboratively brainstormed additional tasks to ensure that all OCD themes would be addressed during treatment. Day 1 ended with a group lunch during which clinicians and patients shared together to promote cohesion among group members and rapport between clinicians and patients.

Day 2 began with a group check-in including a review of psychoeducation, the LET-technique, patients' task lists, and assignment of clinicians to patients. Clinician–patient dyads then separated to engage in exposures together. Clinician-guided exposures were based on the task list created together during the group. Full engagement with feared stimuli (i.e., leaning in) was emphasized and enhanced by feedback from the clinician. Clinicians also asked patients to reflect on their experience during the exposure, including the usefulness of each exposure task. At noon, the group reunited and patients shared their experiences from the exposure they completed so far. As appropriate, clinicians and the group leader shared their observations. The day continued with more clinician-

guided exposures followed by the group check-in (as described above), and homework planning. Prior to discharge for the day, patients were asked to send an email to the clinician they were working with before bedtime describing the homework tasks completed and level of willingness throughout the evening.

The structure of **Day 3** of treatment followed that of Day 2. In addition to a review of psychoeducation and LET-technique, the morning group also included a check-in about the evening. Exposure periods during Day 3 emphasized increasing participant independence in planning and carrying out exposure tasks, and by the final exposure period many patients displayed full autonomy. After the final check-in and homework planning period on Day 3, patients' family members and/or friends joined the group for an hour-long educational presentation. Family and friends were provided with information about OCD, the treatment approach applied in the study, and ways to be supportive.

The aim of **Day 4** was to consolidate the experiences and new learning that occurred during treatment and to plan for ongoing exposures and response prevention. Day 4 began with a review of the core aspects of psychoeducation, with the addition of information about relapse prevention, and a check-in regarding exposures and willingness on the previous evening. Clinician–patient dyads then separated and planned exposure tasks to be completed over the 3 weeks following treatment. Patients were also provided information during follow-up assessment sessions. The group reconvened for a final lunch and the patient group was discharged.

Therapists

Licensed US clinical psychologists at the (Retracted for reviewers XXXX) were trained in the Bergen Four Day Treatment by B4DT experts. The US clinicians completed four days of didactic training in ways to deliver the Bergen Four Day Treatment. The B4DT experts participated in the first 6 of 10 groups to provide ongoing supervision and training. Statistical analyses suggest that there were no differences in outcomes between groups conducted with or without the B4DT experts.

Data analytic plan

All analyses were conducted in SPSS version 27.0 (IBM Corp, 2017) and R version 4.0.1 (R Core Team, 2019). Bivariate correlations and descriptive statistics were calculated across all study variables. The assumption of univariate normality was assessed using the MVN package in R (Korkmaz et al., 2014). Based on the recommendation of Kim (2013) for samples smaller than 50 subjects, a cutoff score of 1.96 was used to determine significant skewness and kurtosis in z-score transformed distributions.

Primary analyses included a series of repeated measures analysis of variance (ANOVA). YBOCS, DOCS-SF, GAD-7, and PHQ-9 scores at pre-treatment, post-treatment, and three- and six-month follow-up were entered as repeated measures variables and, time was entered as the within-subject factor. Similarly, WSAS scores at pre-treatment and at three- and six-month follow-up were evaluated using the repeated measures ANOVA. Missing data for ANOVA were handled using the hotdeck imputation procedure (Myers, 2011). Missing data ranged from 0% at pre-assessment to 39.58% at the six-month follow-up. Hotdecking allows for the imputation of realistic values from related donors to maximize power in the sample (Myers, 2011). Following hotdecking, missing data ranged from 0% at pre-assessment to 22.92% at the six-month follow-up.

Significant effects of time were probed using paired-sample *t*-tests to evaluate within treatment effects and maintenance post-treatment. Cohen's *d* was calculated to provide an estimate of effect size across analyses using the formula (Mpre—Mpost)/SDpre. Reliable change index was calculated for YBOCS and DOCS-SF scores to provide estimates of clinically significant change in OCD symptom severity. We used the method outlined by Jacobson and Truax (1991) to calculate reliable changes. Patients were coded as having responded to treatment if they demonstrated a 35% reduction in the OCD symptom severity, by using an adapted version of the Mataix-Cols criteria, as measured by the YBOCS and DOCS-SF (Mataix-Cols et al., 2016). The frequencies of patients who were classified as demonstrating reliable change and as responding to treatment were calculated.

Results

Preliminary analyses

Results suggested that data were approximately normally distributed and demonstrated homogeneity of variance across variables. Bivariate correlations between baseline scores and subsequent scores across measures were generally non-significant. Data from post-treatment, three-month follow-up, and six-month follow-up time points generally demonstrated moderate associations in the anticipated directions. Patients endorsed moderate YBOCS scores and moderate GAD-7 and PHQ-9 scores at the baseline. Baseline symptom severity did not differ by whether the treatment groups were conducted with the Bergen research team present at the time of treatment or not, *p*'s > .05.

Primary results

Primary outcomes: OCD symptom severity

Results revealed a significant effect of Time on clinician-rated YBOCS scores, $F(3, 90) = 49.54$, $p < .001$, $\eta_p^2 = 0.62$. YBOCS scores significantly reduced from pre- to post-treatment, $t(45) = 13.30$, $p < .001$, and demonstrated a large effect size, $d = 2.90$. Furthermore, there was not a statistically significant increase in clinician-rated YBOCS scores from post-treatment to either follow-up time point, $t_{Three\text{-}Month}(42) = -1.23$, $p = .21$, $t_{Six\text{-}Month}(41) = -1.03$, $p = .31$. See Table 2 for a summary of descriptive statistics and effect sizes and Figure 1 for a visual representation of changes in symptom severity and functioning across time points.

Table 2. Means, standard deviations, and effect sizes (Cohen's *d*) for symptoms of OCD, anxiety, and depression, and functioning.

	Pre	Post	3 Month Follow-Up	6 Month Follow-Up	Cohen's *d* Pre - Post
YBOCS	27.04 (4.37)	11.67 (6.20)	12.73 (8.05)	13.67 (8.41)	2.90
DOCS-SF	31.18 (6.09)	12.69 (8.29)	14.69 (10.57)	13.69 (8.47)	2.52
GAD7	13.32 (5.45)	6.04 (5.50)	6.18 (5.70)	6.02 (5.22)	1.38
PHQ9	10.40 (7.25)	4.77 (4.89)	6.00 (6.26)	5.41 (5.48)	0.92
WSAS	21.86 (8.33)	–	9.00 (7.05)	8.98 (8.11)	1.70

YBOCS = Yale Brown Obsessive Compulsive Scale; DOCS-SF = Dimensional Obsessive Compulsive Scale-Short Form; PHQ9 = Patient Health Questionnaire; GAD7 = Generalized Anxiety Disorders Scale; WSAS = Work and Social Adjustment Scale. Cohen's *d* was not calculated for non-significant *t*-test results.

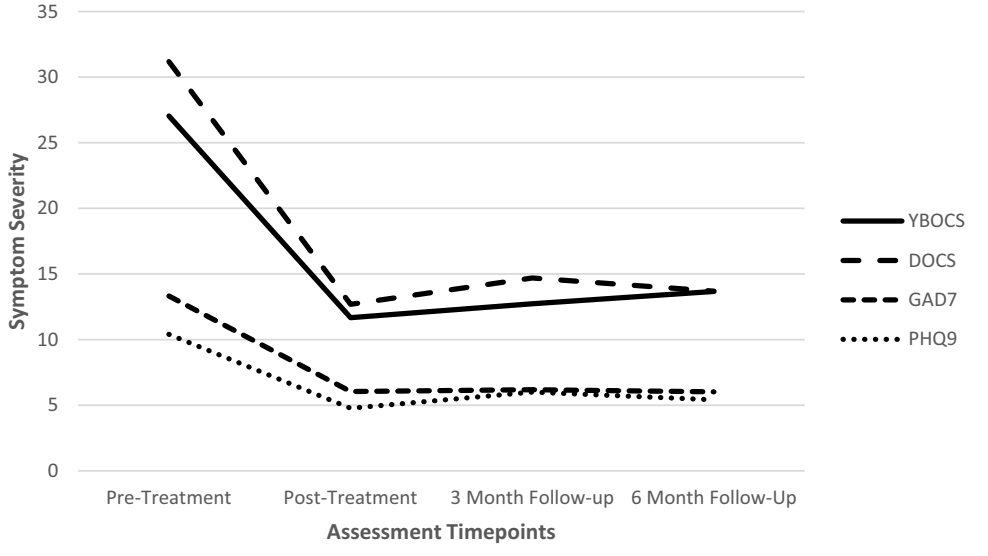

Figure 1. Mean OCD, anxiety, and depression symptom severity across time points. YBOCS = Yale Brown Obsessive Compulsive Scale; DOCS = Dimensional Obsessive-Compulsive Scale; PHQ9 = Patient Health Questionnaire; GAD7 = Generalized Anxiety Disorder Scale; YBOCS score range = 0–40; DOCS score range = 0–40; GAD7 score range = 0–21; PHQ9 score range = 0–27.

Self-reported DOCS-SF scores also demonstrated a significant effect of time, $F(3, 90) = 61.00$, $p < .001$, $\eta_p^2 = 0.67$. Patients reported a statistically significant reduction in DOCS-SF scores from pre-treatment to post-treatment, $t(45) = 13.30$, $p < .001$. This reduction in DOCS-SF scores was also maintained between post-treatment and both follow-up time points, $t_{Three\text{-}Month\ \ Follow\text{-}up}(45) = -1.71$, $p = .09$, $t_{Six\text{-}Month\ \ Follow\text{-}up}(36) = -0.51$, $p = .58$. Collectively, these results indicate that patients and clinicians perceived significant reductions in the OCD symptom severity from pre-treatment to post-treatment and these gains were maintained up to 6 months after completing the Bergen Four Day Treatment.

Considering the clinical significance of changes in OCD symptom severity, approximately 90% of the patients achieved reliable changes in OCD symptom severity during post-treatment based on clinician-assessed and self-reported measures. Furthermore, approximately 80% met the more conservative criteria for "responding to treatment," or a 35% or greater reduction in their baseline OCD symptoms, in the post-treatment assessment, a commonly used measure of OCD treatment (Mataix-Cols et al., 2016). Our definition of treatment response and remission based solely on YBOCS might have resulted in less conservative estimates, limiting comparability with other studies that use both measures of the YBOCS and Clinical Global Improvement (CGI) scores (see, Mataix-Cols et al., 2016). The majority of patients maintained our adjusted measure of reliable change and responder statuses at three- and six-month follow-ups (see Table 3).

Secondary outcomes: anxiety and depression symptom severity and daily functioning

Results indicated that the Bergen Four Day Treatment was associated with statistically significant and large effects on both GAD-7, $F(3, 90) = 22.12$, $p < .001$, and PHQ-9

Table 3. Percentage and frequency of patients that achieved reliable change and responder status on YBOCS and DOCS scores across time points.

	YBOCS		DOCS-SF	
Time Point	Reliable Change Status (%; *n*)	Responder Status (%; *n*)	Reliable Change Status (%; *n*)	Responder Status (%; *n*)
Pre – Post	91.7%; 44	81.3%; 39	87.5%; 42	77.1%; 37
Pre – 3 Month	85.1%; 40	75.0%; 33	80.0%; 36	68.9%; 31
Pre – 6 Month	81.6%; 31	68.6%; 24	88.6%; 39	79.5%; 35

YBOCS = Yale Brown Obsessive Compulsive Scale; DOCS-SF = Dimensional Obsessive-Compulsive Scale-Short Form; Pre = Pre-treatment assessment time point; Post = Post-treatment assessment time point; Total N across time points: Post-treatment = 48; Three month follow-up = 47; Six month follow-up = 45.

scores, $F(3, 90) = 11.39$, $p < .001$. Relative to pre-treatment, patients reported statistically lower scores at post-treatment on both the GAD-7, $t(45) = 7.96$, $p < .001$, and PHQ-9, $t(45) = 5.43$, $p < .001$. These reductions were associated with medium to large effect sizes, $d_{GAD\text{-}7} = 1.38$; $d_{PHQ\text{-}9} = 0.92$. Both self-reported GAD-7, $t(45) = 7.96$, $p < .001$ and PHQ-9 scores did not differ statistically between post-treatment and three- or six-month follow-up assessments.

Patients also demonstrated improvements in their daily functioning. Results suggested that there was a significant effect of time on WSAS scores, $F(2, 39) = 50.58$, $p < .001$. Patients rated their level of functioning significantly higher at three-month follow-up relative to pre-treatment, $t(42) = 8.00$, $p < .001$. Perceived level of functioning was maintained between three- and six-month follow-up, $t(39) = 0.11$, $p = .91$. These results suggest that patients perceived improvements in their daily functioning from pre- to post-treatment and that these improvements did not deteriorate by six-month post-treatment.

Acceptability of the Bergen four day Treatment

Overall, patients indicated that they were highly satisfied with the Bergen Four Day Treatment, see Table 4.

Over 80% of the patients rated the treatment as "excellent". Over 95% of patients reported that they would recommend the Bergen Four Day Treatment to a friend who was experiencing similar problems and that they would complete the program again. However, five patients did not answer these questions about acceptability in post-treatment and, therefore, it is possible that these results are overestimates of patient satisfaction.

Table 4. Post-treatment scores on client satisfaction questionnaire 8 (CSQ-8) for patients treated with B4DT.

Questions	Score 1	Score 2	Score 3	Score 4
1. Quality of service:	0	0	7	36
2. Kind of service:	0	1	14	28
3. Met needs:	0	6	13	24
4. Recommend to friend:	0	1	7	35
5. Amount of help:	1	1	10	31
6. Dealt with problems:	1	0	8	34
7. Overall satisfaction:	0	4	8	31
8. Come back:	0	1	7	35

N = 43. Items are scored on a Likert scale from 1 (low satisfaction) to 4 (high satisfaction).

Although patients reported being highly satisfied with the treatment, it is important to note that although they did not receive ongoing treatment from their study clinician following the completion of the Bergen Four Day Treatment, several patients reported receiving psychotherapy for OCD within 6 months of treatment. Twenty-five percent ($n = 12$) of the sample indicated that they received some form of psychotherapy related to OCD within the first three-month post-treatment. Three more patients (31.25%; $n = 15$) of the total sample reported seeking therapeutic services for OCD by six-month post-treatment. Several other patients (27.1%; $n = 13$) reported seeking treatment for other psychological symptoms but denied that this treatment was related to OCD. Furthermore, during the three- and six-month follow-up some patients reported beginning a psychopharmacological medication since finishing the Bergen Four Day treatment, specifically 3 patients at 3 months and 5 patients at 6 months. Of note, a total of 9 patients reported that they lowered or terminated their dose of their psychopharmacological treatment within six months.

Importantly, when re-analyzing the data with only the subsample of patients ($n = 36$) who had not received follow-up treatment, the pattern of results did not significantly change. The only result that was statistically different from the overall results was the maintenance of depression symptoms from post-treatment to three-month follow-up, $t(24) = -2.092$, $p = .047$, Cohen's $d = 0.446$. However, there was not a significant difference in PHQ-9 scores from post-treatment to six-month follow-up among this subsample.

Furthermore, all of the US clinicians experienced the Bergen Four Day Treatment as highly acceptable. Clinician comments suggested that the condensed treatment format was perceived as being effective, collaborative, and well received by patients. All clinicians reported satisfaction with the treatment approach and voiced interest in continuing to use the Bergen Four Day Treatment and the LET technique in their future work with patients.

Discussion

The aim of the current study was to evaluate the potential effectiveness of the Bergen Four Day Treatment for reducing symptoms of OCD and co-occurring symptoms among patients in the United States. This is the first study to evaluate the potential effectiveness of this novel approach toward ERP for OCD conducted outside of Nordic countries. Overall, the results of the current study replicated the effects of the Bergen Four Day Treatment on OCD, anxiety, and depressive symptoms observed in Norway (e.g. Havnen et al., 2014, 2017) and Iceland (Davíðsdóttir et al., 2019). Clinical outcomes and both patient and clinician satisfaction levels showed the Bergen Four Day Treatment was highly effective in the applied area of the US.

The findings of the current study indicate that patients experienced clinically and statistically significant reductions in OCD symptom severity. Importantly, this result was found across clinician and patient-reported OCD symptom severity. Consistent with previous effectiveness studies of the Bergen Four Day Treatment (e.g., Davíðsdóttir et al., 2019; Havnen et al., 2014, 2017), reductions in OCD symptom severity were also maintained through six-month post-treatment. This finding indicates that the clinical approach taken during the Bergen Four Day Treatment—emphasizing building patient

self-efficacy and willingness to experience anxiety—appears to extend beyond the treatment phase and immediate period following treatment.

Although not explicitly targeted within treatment, patient-rated anxiety and depression symptoms also reduced significantly and these gains were maintained through six-month post-treatment. These findings align with previous research studies that suggest that ERP is often associated with improvements in mood and affective symptoms beyond OCD (e.g. Abramowitz & Jacoby, 2015). Furthermore, patients indicated that their level of psychosocial functioning, including occupational, recreational, and social functioning, improved significantly following the Bergen Four Day Treatment. We found substantial improvements in daily functioning from pre-treatment to the three-month follow-up, which were maintained through the six-month follow-up. Patients transitioned from moderately severe or worse psychopathology (scores of 20 or higher) to severe functional impairment to subclinical functional impairment (scores below 10) after treatment (Mundt et al., 2002). Addressing functional impairment is essential, as patients' experiences of impairment significantly impact their overall perception of the disorder. While functional impairment is moderately related to symptom severity, it remains a valuable and distinct aspect to address in treatment (McKnight et al., 2016). In sum, the findings of the current study highlight the transdiagnostic effects of the Bergen Four Day Treatment that translate into meaningful improvements in patients' ability to engage in daily tasks and activities.

The current study also indicates that the Bergen Four Day Treatment was perceived as acceptable by individuals with OCD. Despite frequently cited concerns by clinicians that patients will not tolerate intensive exposure trials (Abramowitz & Jacoby, 2015), data from the current study suggests that patients were highly satisfied with the Bergen Four Day format and would recommend it to others experiencing impairing OCD symptoms. These ratings mirror those reported in previous studies in Nordic countries that also suggest that the majority of patients who received this treatment found it acceptable and effective (Davíðsdóttir et al., 2019; Havnen et al., 2014, 2017; Launes, Laukvik, et al., 2019). However, almost 32% of the patients in the current study sought additional OCD-focused psychotherapy within 6 months of completing this program. This percentage is higher than the only reported estimate among the published studies using Nordic country samples, with one study finding that only 7.8% ($n = 6/77$) of patients required an additional trial of the Bergen Four Day Treatment (Hansen et al., 2019). However, this study and other published studies testing the potential effectiveness of the Bergen Four Day Treatment have not included estimates of patients who have pursued additional psychotherapy (beyond additional Bergen Four Day Treatment) or pharmacotherapy post-treatment and, therefore, it is difficult to interpret this statistic. Furthermore, in the United States, patients in private health-care settings often take the lead in deciding whether to pursue additional treatment. In contrast, in public health-care systems like Norway's, decisions regarding further treatment are more frequently guided by therapists or established treatment protocols. This could account for the observed differences in the number of patients seeking additional treatment.

This finding may suggest that augmentations may be necessary among some OCD patients from the United States to support maintaining clinical improvements. For example, given that Norway has a centralized health-care system and is geographically smaller than the United States, it may be that patients in this context have more access to

evidence-based treatments for OCD, whereas the current sample reported a latency of nearly 10 years, on average, between the onset of OCD and receiving treatment.

Increasing the emphasis on and implementation of the relapse prevention module of the Bergen Four Day Treatment and/or adding periodic booster sessions following the initial treatment phase may be some modifications necessary to support OCD patients in the United States. Additionally, cultural views of mental health symptoms and treatment, as well as mental health stigma, may differ between European and American samples and contribute to individual differences in response to the Bergen Four Day Treatment. First, it would be important to identify these contribution factors and design appropriate interventions. For example, targeting these mechanisms by implementing ongoing peer-support groups to increase connections to other people with shared psychiatric experiences may promote long-term effects of the Bergen Four Day Treatment in North America. Future research studies should examine predictors of patients who seek OCD treatment following the Bergen Four Day Treatment to clarify who would benefit from additional clinical support and what mechanisms are most important to concentrate on post-treatment.

The current finding provides additional support for the generalizability of the potential effectiveness of the Bergen Four Day Treatment for OCD beyond the Nordic countries' culture and systems of care. For example, effect sizes and indicators of clinical significance (i.e., frequency of patients who met criteria for reliable change and responding status) related to symptom changes in the current study were comparable with previously published effectiveness studies (e.g., Davíðsdóttir et al., 2019; Havnen et al., 2014, 2017). Furthermore, several of the treatment groups within the current study were completed by North American clinicians without the B4DT experts. These groups demonstrated patterns of results that were consistent with the overall sample. These observations indicate that the Bergen Four Day Treatment can be disseminated to clinicians beyond the founding clinical team without sacrificing potential effectiveness for reducing OCD and co-occurring symptoms.

The current findings should be considered in light of its limitations, which point to important future directions. First, as is true with all naturalistic effectiveness/pilot studies, the lack of control condition prevents the ability to draw causal inferences from the current data. Relatedly, patients were self-referred to the research study and, therefore, confounding expectancy effects and individual difference factors may have influenced treatment outcomes. The current study is also limited by the homogeneity of the sample. Specifically, all patients were recruited from a large metropolitan area in the Southern region of the United States. Furthermore, the sample was primarily identified as white, cisgender, and well-educated. Future studies should focus on recruiting samples with greater diversity in reference to racial, ethnic, gender, and sexual identities, as well as educational backgrounds, to provide evidence for the generalizability of Bergen Four Day Treatment for OCD. Additionally, effectiveness studies should also be examined broadly in other clinics in the United States and North America. Such studies would provide more evidence for the generalizability of the current results and also provide an opportunity to evaluate the most effective strategies for disseminating and implementing the Bergen Four Day Treatment. Also, the current study did not explicitly examine the mechanisms of change responsible for the therapeutic effects observed. Given the consistency of findings related to the effectiveness of Bergen Four Day Treatment

(Davíðsdóttir et al., 2019; Havnen et al., 2014; Launes et al., 2020), future studies would do well by focusing on evaluating the neural, cognitive, and behavioral factors that mediate the effects of the Bergen Four Day Treatment on OCD symptoms to clarify the causal mechanisms and future strategies to further improve its effectiveness. Finally, another limitation of the study is the relatively short follow-up period. Extending the follow-up to at least 1 year would provide more comprehensive data on the long-term effects of this short four day treatment and the sustainability of the treatment outcomes.

In summary, the current findings provide initial data supporting the potential effectiveness of the concentrated Bergen Four Day Treatment for reducing OCD symptoms in the United States. Consistent with previous studies, the current results also highlight that the Bergen Four Day Treatment is associated with secondary clinical gains and improved functioning. Patients also indicated that the treatment was highly acceptable and all said they would recommend this to their friends. Future research studies should continue to evaluate the potential effectiveness of the Bergen Four Day Treatment, particularly in comparison with other evidence-based treatments for OCD and identify mechanisms of change responsible for its large and consistent therapeutic effects. Research in this area should also engage in dissemination studies to examine best practices for training in this new approach to implementing ERP and maintaining effectiveness over time.

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