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Long-term effects of mindfulness-based cognitive therapy in patients with obsessive-compulsive disorder and residual symptoms after cognitive behavioral therapy: twelve-month follow-up of a randomized controlled trial

Running head: Long-term effects of MBCT in OCD

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Abstract

We examined the long-term efficacy of mindfulness-based cognitive therapy (MBCT) compared to a psychoeducation group as an active control condition in patients with Obsessive-Compulsive Disorder (OCD) with residual symptoms of OCD after cognitive behavioral therapy. A total of 125 patients were included in a bicentric, interviewer-blind, randomized, and actively controlled trial and were assigned to either an MBCT group ($n = 61$) or a psychoeducation group ($n = 64$). Patients' demographic characteristics and the results from our previous assessments have already been reported (Külz et al., 2019). At the 12-month follow-up the completion rate was 80%. OCD symptoms were reduced from baseline to follow-up assessment with a large effect, but no difference was found between groups. Exploratory analyses showed that a composite score of time occupied by obsessive thoughts, distress associated with obsessive thoughts, and interference due to obsessive thoughts differed between groups in the per-protocol analysis, with a stronger reduction in the MBCT group. At the 12-month follow-up, the two groups showed a similar reduction of symptoms. However, preliminary evidence indicates that MBCT has a superior effect on some aspects of OCD. This should be replicated in future studies.

Keywords: Mindfulness; Obsessive-compulsive disorder; Psychoeducation; Psychotherapy; Randomized controlled trial; Moderation analyses; Y-BOCS

1. Introduction

Approximately one-third of patients with obsessive-compulsive disorder (OCD) do not respond to cognitive behavioral therapy (CBT) as the first-line intervention (Öst et al., 2015). Furthermore, relapse rates in OCD are high, with more than half of those individuals who show a partial or full symptom remission, subsequently relapse (Eisen et al., 2013). To enhance treatment effects, mindfulness-based interventions might be a possible complementary treatment option. Mindfulness-based interventions aim to teach an open, non-judgmental awareness and acceptance of present-moment experience. Through this, individuals with OCD could learn to accept rather than escape from negative thoughts, which could reduce the need to engage in compulsions (e.g., Fairfax, 2008). In western psychotherapy, mindfulness-based interventions were first implemented in structured group programs such as mindfulness-based stress reduction (MBSR, Kabat-Zinn, 2013) but have also been used in individual therapy settings (Mander et al., 2019; Michalak et al., 2019). Mindfulness-based interventions have been shown to be equivalent to evidence-based therapies for reducing symptoms of depression and anxiety at post-treatment (Goldberg et al., 2018). Similar results were found for a reduction in depressive symptoms at follow-up, but not enough studies had been conducted to assess the long-term effects on symptoms of anxiety (Goldberg et al., 2018). A small number of studies on mindfulness-based interventions in OCD exist and there is preliminary evidence showing that mindfulness-based interventions could be beneficial in OCD (for a review, see Manjula & Sudhir, 2019).

Mindfulness-based cognitive therapy (MBCT) was originally developed as a relapse prevention for recurrent depression and combines mindfulness meditation and elements of CBT (Segal et al., 2013). MBCT has been found to be effective in reducing depression, with the most robust findings related to relapse prevention in depression (e.g., Galante, Iribarren, & Pearce, 2013). This positive effect of MBCT remains through to the follow-up period at which MBCT shows similar reductions of depressive symptoms in patients with a current

episode of depression compared to active therapies, however, the number of studies is small (Goldberg et al., 2019). With only two previous studies on MBCT in OCD, research in this field is scarce but shows some promising results. Both studies were conducted as an augmentation for CBT and showed a significant reduction in OCD symptoms compared to a waitlist control (Key et al., 2017; Selchen et al., 2018). However, those studies are limited by methodological problems, such as the lack of an active control group, small sample size and short follow-up intervals of less than three months (Key et al., 2017; Selchen et al., 2018).

Recently, we conducted a randomized controlled trial assessing the effectiveness of MBCT compared to a group receiving psychoeducation in patients with OCD. At post treatment, patients profited more from MBCT compared to the control condition on secondary outcomes, but no differences were found at the 6-month follow-up (Külz et al., 2019). Meta-analyses highlight the importance of longer follow-up periods (Goldberg et al., 2019), and in one previous study MBCT was shown to be superior to the active control condition only at the 12-month follow-up (Bowen et al., 2014). The present study is a 12-month follow-up (FU-12) on the previously published findings of the randomized controlled trial (Külz et al., 2019). As described in the study protocol (Külz et al., 2014) we planned to determine the number of treatment responders, partial responders, and nonresponders as well as the effect of MBCT on OC symptom reduction, and on secondary outcomes such as depressive symptoms and quality of life. We hypothesized that MBCT would show a greater reduction from baseline to 12-month follow-up of OCD symptoms as measured by the Yale-Brown Obsessive Compulsive Scale (primary outcome) compared to the active control condition. Furthermore, we investigated possible moderators on symptom change. Another exploratory analysis was based on the assumption that an effective MBCT treatment would teach participants to refrain from resisting or controlling thoughts. Thus, participants who learned to adapt a mindful way to deal with their obsessions and compulsions would likely report a lower resistance to obsessions or compulsions (item 4 of the Y-BOCS) or a lower degree of control over

obsessive thoughts (item 5 of the Y-BOCS). This would, however, lead to higher scores on items 4 and 5 and higher scores on the Y-BOCS in general. Therefore, it was planned to test the effect of MBCT on the composite score of the first three items of the Y-BOCS (namely, time occupied by obsessive thoughts, interference due to obsessive thoughts, and distress associated with obsessive thoughts).

2. Method

2.1. Study design and interventions

We conducted a bicentric, interviewer-blind, randomized, and actively controlled clinical trial to examine the effectiveness of MBCT for individuals with OCD who had previously not responded to CBT. Our MBCT protocol for OCD relied on the adaptation of a manual for prevention of relapse in patients with major depression (Segal et al., 2013). We compared MBCT to a psychoeducational group program (OCD-EP) to control for unspecific effects of group treatment. Besides psychoeducational elements (e.g., about the etiology and maintaining factors of OCD, metacognitive and neurobiological perspectives, pharmacotherapy and psychological treatments for OCD), OCD-EP encouraged group sharing of personal experiences and helpful coping strategies for OC symptoms. Both programs were conducted in eight weekly two-hour group sessions with a two-hour booster session in each group at 3 and 6 months post intervention. The study was approved by the local ethics committees and was pre-registered with the German Clinical Trials Register (DRKS00004525).

2.2. Participants

A total of 125 patients aged 18 through 70 years with a primary diagnosis of OCD were randomly assigned to either MBCT ($n = 61$) or OCD-EP ($n = 64$). Nonresponse to CBT¹ was one of several inclusion criteria, which are described in detail in (Külz et al., 2019); 80% of

¹ Nonresponse to CBT was defined as no or only temporary remission (< 6 months) of OC symptoms after having completed at least 20 sessions of CBT within 3 years prior to study inclusion.

all participants were assessed at FU-12 (MBCT: $n = 48$ (78.7%); OCD-EP: $n = 52$ (81.3%).

The progression of participants through the study is shown in Figure 1. Participants reported a mean age of 38.62 ($SD = 12.0$) years, 61 % were female, the Y-BOCS scores showed moderate symptoms of OCD (MBCT: $M = 20.8$, $SD = 6.5$, OCD-EP: $M = 23.1$, $SD = 5.8$) the mean illness duration was 11.74 ($SD = 9.9$) years. More information on the demographic data of the sample is published in Külz et al. (2019). After randomization we asked participants whether they had been allocated to their preferred group (answers: “yes”, “no”, “partly”, “I did not have a preference”). The two groups did not differ regarding their preferred allocation to either group ($\chi^2(3, N = 116), = 7.13, p = .07$).

2.3. Outcome measures

The Y-BOCS (Goodman et al., 1989) represented the primary outcome measure. The Y-BOCS is a semi-structured interview with a total score ranging from 0-40 and two subscales (obsessions and compulsions). With an inter-rater reliability of $r = 0.90$ for the total score, and a Cronbach's alpha of $\alpha = 0.80$, the German version has demonstrated good psychometric properties (Jacobsen et al., 2003). Secondary outcome measures were the Obsessive-Compulsive Inventory Revised (OCI-R; Foa et al., 2002), the World Health Organization Quality of Life Abbreviated Version (WHOQOL-BREF; Skevington, Lotfy, & O'Connell, 2004), the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996), the Brief Symptom Inventory (BSI; Derogatis, 1993), the Obsessive Beliefs Questionnaire (OBQ-44; Obsessive Compulsive Cognitions Working Group, 2003), the short form of the Metacognitions Questionnaire (MCQ-30; Wells & Cartwright-Hatton, 2004), the Distress Tolerance Scale (DTS; Simons & Gaher, 2005), the Kentucky Inventory of Mindfulness Skills (KIMS; Höfling, Ströhle, Michalak, & Heidenreich, 2011), and the Self-Compassion-Scale (SCS; Neff, 2003) All measures were administered pre treatment (baseline), post treatment (post), and at 6-month (FU-6) and 12-month follow-ups (FU-12).

2.4. Statistical analyses²

We computed a repeated measures ANOVA to test changes in the Y-BOCS total score across the four assessment points (baseline, post, FU-6, FU-12). To test our hypothesis that MBCT would lead to a greater reduction symptoms of OCD (primary outcome: Y-BOCS) compared to OCD-EP, we computed a univariate ANCOVA with the FU-12 scores as the dependent variable, controlling for baseline scores. Similar ANCOVAs were run for all secondary outcomes. All participants who completed both baseline and FU-12 assessments and participated in at least four sessions of the interventions were included in the per-protocol (PP) analyses³. For the intention-to-treat (ITT) analyses, the multiple imputation (MI) procedure was adopted to estimate the FU-12 scores for non-completers (because no data were available for the reassessment). All participants with baseline data were included. The percentage of missing values across the 44 variables varied between 20.8% and 30.4% (Y-BOCS FU-12: 24.0%). Twenty-four imputations were run in order to deal with dropout cases. We calculated MI in R (R Core Team, 2018), assuming that the data were missing at random. Group assignment (MBCT, OCD-EP), demographic variables (age, gender, years of education), and all psychopathological total scores and subscores at baseline, post, FU-6, and FU-12 (see Table 1) were entered into the model as predictors for imputation. For MI results, combined *p*-values of logistic regressions are reported. In these regression analyses, FU-12 scores served as dependent variables and baseline scores were entered as covariates in order to avoid regression to the mean biases. We calculated an additional exploratory analysis using a sum score of items 1–3 of the Y-BOCS to assess changes in obsessions, without including items on resistance or control of thoughts. The rates of patients achieving response or partial response between the start of the treatment and the FU-12 were compared using Fisher's exact

² Our data analytic strategy was chosen in line with the proposed analyses as stated in the study protocol (Külz et al., 2014) and similar to the analyses of our previously published findings (Külz et al., 2019).

³ This cut-off was chosen following Teasdale et al. (2000) who determine/define a participation rate of at least four of eight sessions as the „minimum effective dose“. In the current study, mean participation rates did not differ between groups (see Külz et al., 2019)

test.⁴ Exploratory moderation analyses were conducted to identify variables that affected differential symptom improvement for the two conditions. The outcome measures were the difference scores (FU-12 – baseline) of (1) Y-BOCS total, (2) Y-BOCS obsessions subscale, and (3) Y-BOCS compulsions subscale using the SPSS macro PROCESS by Hayes (2013).

3. Results

T-tests for independent samples revealed that participants who could not be reassessed at FU-12 assessment did not differ from those who were reassessed at FU-12 on either sociodemographic data (age, years of education, gender (χ^2 -test); $ps > .054$) or psychopathological baseline data (Y-BOCS total, Y-BOCS obsessions, Y-BOCS compulsions, OCI-R, BDI-II, BSI, WHOQOL-BREF, KIMS-D, OBQ-44, MCQ-30, SCS, DTS; $ps > .20$). Thus, it can be assumed that the data was missing at random.

The repeated measures ANOVA revealed a significant within-subject reduction of OCD symptoms (Y-BOCS total) across the four assessment points, $F(1,91) = 28.75, p < .001, \eta^2_{\text{partial}} = .49$ with a very large effect (see figure 2). A follow-up ANOVA showed that a significant reduction also emerged between FU-6 ($M = 17.07, SD = 7.58$) and FU-12 ($M = 15.86, SD = 7.95$), $F(1,91) = 6.20, p = .02, \eta^2_{\text{partial}} = .06$ with a medium effect. However, no significant differences were found between the two groups on any of the measures in either the PP or ITT analyses at FU-12 (see Table 1). The exploratory analysis using the sum of items 1–3 for the obsessions-related items of the Y-BOCS showed a significant difference between the two groups in the PP analysis, $F(1,95) = 4.00, p = .049; \eta^2_{\text{partial}} = .04$ with a small to medium effect. Patients in the OCD-EP group reported higher scores ($M = 5.36, SD = 2.80$) than patients in the MBCT group ($M = 4.02, SD = 2.54$). However, in the ITT analyses the effect did not reach significance ($p = .10$).

⁴ Rates of responders, partial responders, and nonresponders were calculated according to an international consensus definition (Mataix-Cols et al., 2016) by which treatment response in OCD is defined as $\geq 35\%$ improvement in the Y-BOCS score and a clinical global impression rating of 1 (“very much improved”) or 2 (“much improved”). Partial response is defined as 25% to 35% improvement in the Y-BOCS score plus a clinical global impression rating of at least 3 (“minimally improved”).

See Table 2 for the proportions of responders, partial responders, and nonresponders (for the criteria, see footnote 1). No differences emerged between the MBCT group and the OCD-EP group regarding response compared to partial response or nonresponse (Fisher's exact test, one-tailed $p = .43$). Similarly, no difference between response and partial response compared to nonresponse was found between the groups (Fisher's exact test, one-tailed $p = .34$).

Exploratory analyses revealed that participants in the MBCT group who had a comorbid dysthymia showed less reduction of OC symptoms (Y-BOCS total, Y-BOCS compulsions) compared to those in the OCD-EP group. However, patients with a previous episode of major depressive disorder showed a larger improvement of compulsions in the MBCT compared to the OCD-EP group. Furthermore, participants who were on serotonin-noradrenaline reuptake inhibitors (SNRI) at baseline showed a larger reduction of compulsions from baseline to FU-12 in the OCD-EP compared to the MBCT group (see Table 3). Other moderators such as duration of illness ($ps > .18$) or Y-BOCS score at baseline did not serve as significant moderators ($ps > .47$).

4. Discussion

This is the first study to evaluate a 12-month follow-up on the effects of MBCT among individuals with OCD who had not responded to CBT. Independent of group allocation, a significant reduction of OC symptoms was demonstrated for the four assessment points with a large effect size, showing that both group programs were effective in reducing OC symptoms over the course of one year post treatment. Furthermore, the significant reduction between FU-6 and FU-12 indicates that treatment effects at post treatment and at FU-6 were not only maintained at FU-12 but that symptom severity further decreased. Nevertheless, at FU-12 we found no significant between-group effects, neither for symptom severity, nor for any of the secondary outcome measures, nor for treatment response. Thus, contrary to expectations, MBCT might not be superior to a psychoeducation group in treating OCD patients with

residual symptoms following CBT. This result conflicts with meta-analyses on long-term effects of MBCT for patients with recurrent MDD in full or partial remission. For this patient group, MBCT has proven effective within a 60-week follow-up period as compared to active control conditions (Kuyken et al., 2016). MBCT has also been shown to be effective in reducing the rate of relapse in patients with three or more previous episodes of depression by 40% at a one-year follow-up (Galante et al., 2013). Furthermore, in treating mental disorders in the acute phase, mindfulness-based interventions have proven superior to non-specific active controls with moderate effects, and to specific active controls with small effects at follow-up (Goldberg et al., 2018). However, our results are in line with more recent meta-analyses which do not suggest superior long-term effects of MBCT for patients in the acute phase of MDD (Wang et al., 2018) and of mindfulness-based interventions for treating other mental disorders (overall effects at follow-up of $g = 0.16$; Hedman-Lagerlöf, Hedman-Lagerlöf, & Öst, 2018). Several reasons might account for the nonsignificant group differences. First, our sample reported a long duration of illness and moderate symptoms of OCD. Hence, the standard 8-week program might have been insufficient to reveal MBCT-specific treatment effects. In our sample neither duration of illness nor Y-BOCS scores were found as significant moderators. However, treatment length was found to be a significant moderator of treatment effect in mindfulness-based interventions (Hedman-Lagerlöf et al., 2018). Hence, one might assume that a patient group with such a high level of functional impairment needs more frequent and continuous guidance to develop a new way of relating to (stressful) experiences and to integrate mindfulness practice into their daily routine. Second, our control group might have produced effects that go beyond unspecific group effects. The OCD-EP program might have motivated patients to successively reactivate and apply CBT strategies developed in previous or concurrent therapy, which might have produced effects similar to those of the MBCT group at FU-12. Of note is that some elements of the OCD-EP program (e.g., psychoeducation on maintaining factors or metacognitive perspectives) are

similar to the cognitive components of the MBCT program. In their dismantling study, Williams and colleagues (2014) showed that for patients in remission from MDD, cognitive psychological intervention without meditation practice is equally effective as MBCT in preventing recurrence of depression over 12 months (except for those with a history of childhood trauma). Hence, in the current study, the improvements in both groups might as well be attributable to cognitive psychoeducation and non-specific elements such as therapist support, rather than to training in mindfulness meditation.

Third, a measurement issue might account for the nonsignificant group differences. Two items of the Y-BOCS measure OCD-related phenomenological aspects that are exactly the opposite of a mindful way of relating to stressful thoughts, namely, the effort to resist and the ability to control obsessive thoughts (items 4 and 5). Hence, higher scores in these two items (i.e., less resistance and control) in the MBCT group might have dampened the effects.

Preliminary evidence for this explanation is provided by our exploratory analysis of Y-BOCS items 1–3. The significant difference between the two groups in the per-protocol analysis indicates a greater reduction in the composite score of the three items measuring time occupied by obsessive thoughts, interference due to obsessive thoughts, and distress associated with obsessive thoughts in the MBCT group (i.e., when not taking into account attempts to resist and control thoughts). However, as this analysis was exploratory in nature, the result must be replicated in future studies before drawing firm conclusions, especially as it was not confirmed in the ITT analysis.

One might also assume that improvements in both groups are attributable to spontaneous remission. However, studies on the natural course of OCD in clinical samples indicate a chronic course of illness with low rates of remission, especially in the short term. Marcks, Weisberg, Dyck, & Keller (2011), for example, found that the probability of remission was just .16 after one year. In a prospective study with a follow-up period of 40 years, complete recovery occurred in only about one fifth of the sample, and the majority of

patients continued to have clinical or sub-clinical symptoms (Skoog and Skoog, 1999).

Although another prospective, longitudinal investigation on clinically relevant OC symptoms in a population-based sample suggest a better prognosis, with about two-thirds of participants diagnosed with OCD became sustainably symptom free, median duration to remission was 16 years and chronicity of the symptoms predicted persistence of OCD (Fineberg et al., 2013). Hence, it seems unlikely that in our 12-month follow-up of a treatment-seeking sample of CBT non-responders characterized by a relatively long duration of illness, spontaneous remission accounts for the improvements in both treatment groups.

Regarding our moderator analyses, the stronger reduction of compulsions in OCD patients with a previous major depressive disorder is in line with current research on the effectiveness of MBCT in patients with recurrent major depressive disorder (Galante et al., 2013). Chronic depressive symptoms, as in dysthymia, seem to impede symptom reduction, perhaps due to more severe impairment in social and emotional functioning in this patient group (Arnow and Constantino, 2003). SNRI may have moderated the effect because patients in the OCD-EP group learned about the use of pharmacotherapy, which may have increased their compliance with the prescribed medication.⁵

Taken together, the strengths of our study are (1) the comparison of MBCT to an active control treatment with no differences in self-reported preference regarding the allocation to either group, (2) low drop-out rates, with 80% of participants providing follow-up data, (3) high external validity due to the inclusion of participants with concomitant pharmacotherapeutic or psychotherapeutic treatment, allowing for generalizability of our results to routine clinical practice. Study limitations include (1) the lack of assessment of patients' formal, as well as informal mindfulness practice at home, (2) reduced internal validity due to the inclusion of patients who were undergoing accompanying psychopharmacological or psychotherapeutic

⁵ However, SNRI intake only applied to 8% of the total sample (see Külz et al., 2019), whereas no moderating effect on treatment outcome was found for selective serotonin reuptake inhibitors (SSRIs) as the first-line pharmacologic therapy for OCD (48% of the sample).

treatment, and (3) reliance on patients' reports regarding previous CBT. Future studies should assess mindfulness practice at home as one possible moderator of treatment outcome and should investigate if longer or more intense treatment is needed for OCD patients. It might be that the "minimum effective dose" of at least four of eight sessions is not enough for OCD patients, especially for those who did previously not respond to CBT. Hence, future research in this field should incorporate different treatment lengths in their designs to investigate the dose-response relationship for detecting sustained changes for OCD patients. Another interesting research direction would be the application of MBCT for preventing relapse in OCD patients who previously responded to CBT. This would be of high clinical importance since a recent long-term study revealed that 48% of patients initially reaching remission after intensive CBT treatment subsequently relapsed (Külz, Landmann, Schmidt-Ott, Zurowski, & Wahl-Kordon, Voderholzer, in press). By maintaining awareness about obsessive-compulsive thinking patterns and behavioral responses, MBCT might support patients to continuously engage in exposure training in daily life, which turned out to be the only significant predictor of further improvement of OC-symptoms within the follow-up period in that study.

To conclude, both group programs were effective in reducing OC symptoms over the course of one year post treatment. However, our results indicate no long-term differential augmentation effect of MBCT for OCD compared to the active control condition.

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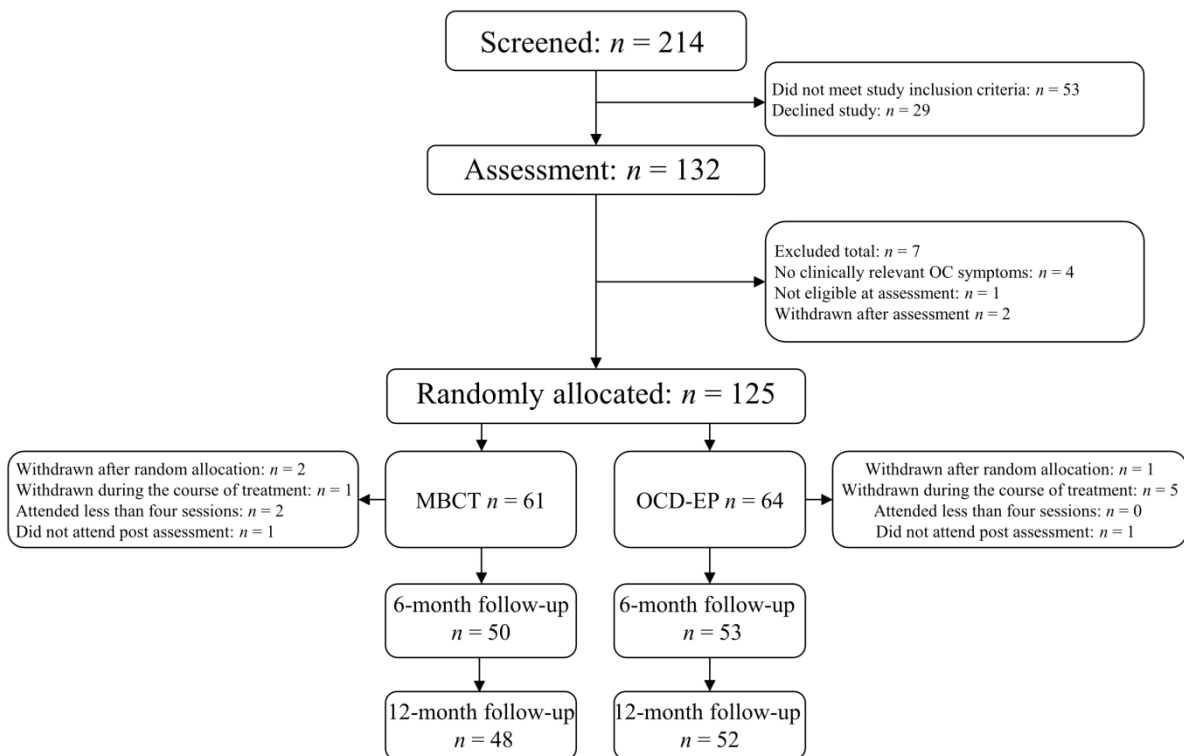


Figure 1. Flow of participants through the study. MBCT: mindfulness-based cognitive therapy; OCD-EP: psychoeducation control group for OCD (adapted from Külz et al., 2019)

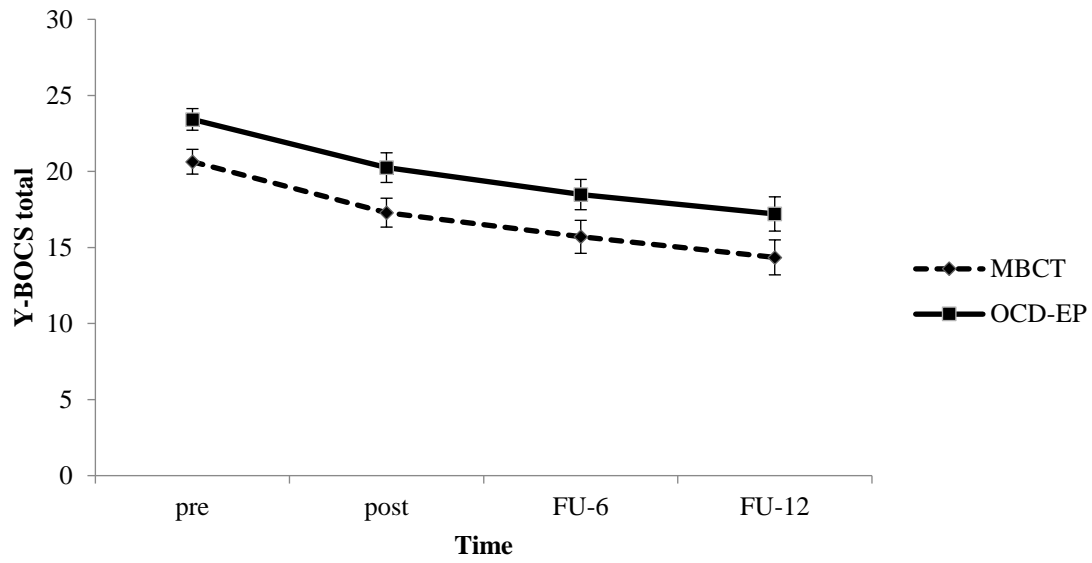


Figure 2. Mean Y-BOCS total score and standard errors across the four assessment time points (before and after the intervention and at the 6-month and 12-month follow-ups), differentiated by group (MBCT = Mindfulness-Based Cognitive Therapy, OCD-EP = psychoeducation group).

Table 1. Descriptive statistics (*M* and *SD*) for all primary and secondary outcome measures of the sample included in the per-protocol analyses (ANCOVAS) testing for between-group differences at the 12-month follow-up assessment (FU-12), controlling for baseline values. Intention-to-treat analyses, including all data after multiple imputation, are presented in square brackets.

Outcome Variables	MBCT		OCD-EP		ANCOVA
	Baseline	FU-12	Baseline	FU-12	Per-Protocol [Intention-to-Treat]
Y-BOCS total score	20.8 (6.5)	14.35 (7.80)	23.1 (5.8)	17.2(7.9)	$F(1,95) = 0.50, p = .48; \eta^2_{\text{partial}} = .05 [p = .80]$
Y-BOCS obsessions	9.9 (3.4)	6.3 (3.62)	11.1 (3.1)	8.5 (4.4)	$F(1,95) = 3.72 p = .06; \eta^2_{\text{partial}} = .04 [p = .27]$
Y-BOCS compulsions	10.8 (3.8)	8.1 (4.73)	11.9 (3.2)	8.8 (4.4)	$F(1,95) = 0.19 p = .66; \eta^2_{\text{partial}} = .002 [p = .62]$
BDI-II	19.3 (10.7)	14.5 (11.68)	20.2 (10.4)	16.0 (11.6)	$F(1,85) = 0.67 p = .42; \eta^2_{\text{partial}} = .01 [p = .89]$
BSI Global Severity Index	1.1 (0.6)	0.8 (0.6)	1.3 (0.7)	0.9 (0.6)	$F(1,88) = 0.05 p = .83; \eta^2_{\text{partial}} = .001 [p = .81]$
OCI-R	24.8 (10.1)	19.5 (10.9)	26.3 (13.0)	20.9 (11.2)	$F(1,82) = 0.64 p = .43; \eta^2_{\text{partial}} = .01 [p = .93]$
WHOQOL-BREF Global Score	46.0 (21.2)	63.4 (19.6)	46.9 (19.7)	57.1 (21.0)	$F(1,89) = 2.80 p = .10; \eta^2_{\text{partial}} = .032 [p = .40]$
KIMS-D total score	118.9 (18.4)	124.9 (20.6)	112.9 (14.3)	120.2 (18.4)	$F(1,91) = 0.06 p = .81; \eta^2_{\text{partial}} = .001 [p = .95]$
OBQ-44 total score	188.7 (51.4)	157.9 (61.0)	199.8 (44.7)	162.1 (57.0)	$F(1,90) = 0.01 p = .92; \eta^2_{\text{partial}} < .001 [p = .78]$
MCQ-30 total score	73.5 (15.5)	63.1 (15.1)	74.4 (14.6)	65.7 (15.6)	$F(1,91) = 0.68 p = .41; \eta^2_{\text{partial}} = .008 [p = .87]$
SCS total score	15.5 (3.4)	17.6 (4.3)	14.9 (3.9)	17.1 (3.8)	$F(1,88) = 0.05 p = .83; \eta^2_{\text{partial}} = .001 [p = .76]$
DTS total score	3.3 (0.8)	3.5 (0.8)	2.9 (0.7)	3.1 (0.8)	$F(1,91) = 0.67 p = .42; \eta^2_{\text{partial}} = .008 [p = .46]$

Note. Y-BOCS = Yale Brown Obsessive Compulsive Scale; BDI-II = Beck Depression Inventory II; BSI = Brief Symptom Inventory; OCI-R = Obsessive-Compulsive Inventory-Revised; WHOQOL-BREF = World Health Organization Quality of Life-BREF; KIMS-D = Kentucky Inventory of Mindfulness Skills; OBQ-44 = Obsessive Beliefs Questionnaire; MCQ-30 = Metacognitions Questionnaire; SCS = Self-Compassion Scale; DTS = Distress Tolerance Scale

Table 2. Frequency and (percentage) of responders, partial responders, and nonresponders at 12-month follow-up (FU-12).

	MBCT FU-12	OCD-EP FU-12
Response	20 (32.8%)	19 (29.7%)
Partial Response	7 (11.5%)	6 (9.4%)
Nonresponse	34 (55.7%)	39 (60.9%)

Note. MBCT = Mindfulness-based cognitive therapy, OCD-EP = psychoeducation group for OCD.

Table 3. Significant interaction results of moderation analyses, showing moderators of improvement in OCD symptoms (difference scores [FU-12 – baseline] for Y-BOCS total and Y-BOCS compulsions; means are centered)

Outcome Parameter	B	SE	<i>t</i>	<i>p</i>	LLCI	ULCI
Dysthymia						
Y-BOCS total	-8.27	4.04	-2.05	.04	-16.29	-0.24
Y-BOCS compulsions	-5.13	2.32	-2.21	.03	-9.76	-0.53
Prior episode of MDD						
Y-BOCS compulsions	3.41	1.53	2.23	.03	0.37	6.46
SNRI						
Y-BOCS compulsions	-5.78	2.54	-2.28	.03	-10.82	-0.73

Note. LLCI = lower limit confidence interval, ULCI = upper limit confidence interval, Y-

BOCS = Yale Brown Obsessive Compulsive Scale, MDD = major depressive disorder,

SNRI = serotonin-noradrenaline reuptake inhibitors.