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A Pilot Study of Cognitive Behavioral Group-Treatment for Obsessive Compulsive Disorder in Patients with Co-morbid Autism Spectrum Disorder

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Abstract

Background: Obsessive compulsive disorder (OCD) often occurs in combination with autism spectrum disorder (ASD). There is limited research on treatment outcome for OCD in patients with co-morbid ASD. The main objective of the present study was to determine if OCD patients with co-morbid ASD benefit from modified Cognitive Behavioral Therapy (CBT) group-treatment in reducing OCD-symptoms. **Method**: For 16 weeks, 18 OCD patients with co-morbid ASD were treated in our modified CBT group-treatment. OCD-symptoms were measured at: pre- and post-waitlist, post-treatment and follow-up. Primary treatment outcome was assessed by change on the Yale-Brown Obsessive-Compulsive Scale. To compare modified CBT group-treatment outcome with our regular CBT group-treatment outcome, patients were matched with 18 patients with OCD but without ASD, according to pre-treatment OCD-symptom severity, age and gender. **Results**: Patients in modified CBT group-treatment showed significant reduction in OCD-symptoms compared to waitlist. Modified CBT group-treatment was not equivalent to regular CBT group-treatment in patients without ASD. **Conclusion**: These findings indicate that patients with OCD and co-morbid ASD can benefit from modified CBT group-treatment but to a lesser extent than patients in regular CBT group-treatment. Future research should be directed at randomizing OCD patients with co-morbid ASD to modified or regular group-treatment.

Keywords: Obsessive Compulsive Disorder, Autism Spectrum Disorder, Comorbidity, Cognitive Behavioral Therapy

A Pilot Study of Cognitive Behavioral Group-Treatment for Obsessive Compulsive Disorder in Patients with Co-morbid Autism Spectrum Disorder

Obsessive compulsive disorder (OCD) has a high comorbidity with a range of disorders (Ruscio, Stein, Chiu, & Kessler, 2010). Specifically, OCD and autism spectrum disorder (ASD) are disorders that are related. The comorbidity of OCD and ASD has been investigated in several studies. Comorbidity requires specific treatment targets and a more diverse treatment approach (Gillberg & Billstedt, 2000; Simonoff et al., 2008; Bejerot, 2007). This research is particularly important, because in practice comorbidity shows a complex composite clinical image (van Berckelaer-Onnes, 2009), resulting in a considerable impact on diagnosis and treatment (Zandt, Prior, & Kyrios, 2007).

When diagnosing, it is complicated to identify OCD in ASD due to overlap in symptoms (Simonoff et al., 2008). In the definition of both disorders, repetitive behavior is a core symptom (APA, 2013) and repetitive thoughts and behavior in OCD are similar to ASD (Ivarsson & Melin, 2008). Besides the repetitive behavior, impairment in social competence seems to be a common factor (Chasson et al., 2011). A study conducted by Prudon (2011) supports these results, by reporting that similarities are mainly detail sensitivity, ritualized way of interest, ritualization of everyday routines and a compulsive behavioral style. On the other hand, there is a difference in symptom dynamics between ASD and OCD compared to the symptom dynamics in only OCD (Ruzzano, Borsboom, & Geurts, 2015). For example, patients diagnosed with OCD and co-morbid ASD show more compulsive rather than obsessive symptoms, compared to patients with only a diagnosis of OCD (McDougle, Kresch, Goodman, & Naylor, 1995). Concerning repetitive behavior, rituals matching with ASD provide satisfaction and protect patients against external stimuli. Behavior matching with OCD is mainly performed to reduce anxiety. In addition, rituals in ASD are not experienced as unpleasant and patients are not aware of the rituals. In contrast to patients with OCD, where behavior is accompanied by high suffering and often considered unnecessary by patients (Schuurman & Shiboleth, 2011).

In treatment, comorbidity results in a complex situation due to additional limitations in patients with an ASD diagnosis. Patients with ASD have impairments in information processing and executive functioning, they lack flexibility in thinking, they have problems with set shifting, struggle to recognize their own body signals and emotions, feelings and behavior of other people (Attwood, 2006). These limitations in socio-emotional functioning,

and executive functioning are not specifically addressed in regular cognitive behavioral therapy (CBT) group-treatment (Bruin, 2004). In some OCD treatments, it also ensured that ASD is an exclusion criterion (Murray, Jassi, Mataix-Cols, Barrow, & Krebs, 2015).

There is consistent evidence that CBT and exposure with response prevention (ERP) significantly reduce OCD-symptoms for patients with OCD (Balkom et al., 2013). Also, results show that CBT is effective in increasing quality of life (QoL) for patients with OCD and co-morbid disorders (Macy et al., 2013). Despite the strong evidence of comorbidity of OCD and ASD, it is remarkable there are only few studies that focus on the treatment of OCD in patients with ASD. In a number of studies, the effectiveness of CBT was studied in patients with OCD and ASD. A significant reduction in OCD-symptoms was found in all of these studies (Tsuchiyagaito et al., 2017; Murray et al., 2015; Russell, Mataix-Cols, Anson, & Murphy, 2009; Russell et al., 2013). When the effectiveness of a treatment is determined, reducing symptoms is an important starting point. However, only focusing on reducing symptoms is too limited to determine the well-being of patients after treatment. In determining well-being, the degree of QoL is very important, since QoL is a representation of the functioning in daily life (Macy et al., 2013). These are promising results. However, these studies are mostly case studies, have no waiting condition or only focus on treatment of children. In two studies it was found that although patients do benefit from CBT, it is to a lesser extent than patients without ASD and modified protocols are needed (Murray et al., 2015; Tsuchiyagaito et al., 2017).

Additionally, a specific intervention aimed at both OCD and ASD does lead to reduce impairments and improve QoL (Bejerot, 2007; Simonoff et al., 2008). To adjust the regular CBT group-treatment for patients with ASD, seven adjustments are recommended from different studies (Kan, 2013; Bruin, 2004; Attwood, 2006): having continuity in treatment, setting feasible goals, considering the generalization problem, giving attention to stress and stress reduction, focusing on the aftercare process, individual guidance and giving attention to the recognition of body signals. When these interventions are applied it is expected that treatment will be more tuned to patients with co-morbid ASD and that it will enhance treatment outcome.

A number of factors seem to play a role in predicting the efficacy of CBT. The degree of symptom severity seems to be related to the effect of CBT. In addition to the degree of OCD-symptoms, a comorbidity of depression appears to be predictive of treatment quality. When patients suffer from depressive symptoms, patients seem less motivated for therapy.

Additional research into pre-treatment characteristics that are related to the response of CBT may support practitioners to offer the most appropriate treatment (DeVeaugh-Geiss et al., 1992; Abramowitz, Franklin, Street, Kozak, & Foa, 2000).

The aim of the present study is to systematically evaluate modified CBT group-treatment for OCD in patients with co-morbid ASD. For 16 weeks, 20 patients with OCD and ASD were treated in our modified CBT treatment program at the Amsterdam University Medical Centre. In this program, all 7 recommendations were used to optimize the regular CBT group-treatment for ASD. Results were also compared with patients with OCD but no ASD, treated in our regular CBT group-treatment. The two main questions: 1) Is modified CBT group-treatment for OCD as effective for patients with co-morbid ASD compared to the waitlist-control condition? 2) Is there a difference in effectiveness between modified CBT group-treatment and regular CBT group-treatment? It was expected that patients with OCD and ASD do benefit from modified CBT group-treatment in reducing OCD-symptoms and improving QoL. We also expected modified CBT group-treatment as effective as regular CBT group-treatment.

Because these data are so unique, exploratory research has been done at pre-treatment patient characteristics. Two additional questions: 3) Is there a difference in OCD-symptoms between OCD-ASD patients and only OCD patients? 4) Is there a correlation between patient characteristics at pre-treatment and effectiveness of modified CBT group-treatment? In comparison with OCD patients only, we expect more compulsive symptoms than obsessive symptoms in OCD-ASD patients at pre-treatment. Finally, we expect a high score on pre-treatment patient characteristics (such as severity of depression-, ASD-symptoms and a low score on QoL) to be negatively related to the efficacy of modified CBT group-treatment.

Method

Design

A pilot study design was carried out for modified CBT group-treatment of OCD-symptoms in patients diagnosed with OCD and co-morbid ASD. Data is used from the psychiatry department of Amsterdam University Medical Centre.

Participants

Two different samples were used for this pilot study. The first sample consisted of patients diagnosed with OCD and co-morbid ASD, who received modified CBT group-

treatment. Patients were recruited from specialist ASD clinics and the Amsterdam University Medical Centre. Patients met the following inclusion criteria: a confirmed primary diagnosis of DSM-5 criteria for OCD and ASD, normally estimated IQ (>70), age between 18 and 65, no other major psychiatric disorder, motivation for CBT and stable psychiatric medication in the 6 weeks prior to study entry. Patients were excluded if they had current psychotic symptoms, a current episode of major depression and substance misuse or severe physical complaints. A team of experts in OCD, consisting of a psychiatrist, psychologist and a behavioral expert were involved in establishing OCD diagnosis. A semi-structured interview, MINI Plus (Hergueta, Baker, & Dunbar, 1998) was conducted to ascertain the primary diagnosis of OCD. Diagnosis of ASD was confirmed in a three-hour assessment, consisting of development anamnesis and hetero-anamnesis by clinics with expertise in ASD. Diagnostic information was supplemented by the NIDA (Vuijk, 2014). In total, 20 patients between the age of 21 and 54 years participated the modified CBT group-treatment. From 2016 to 2018, three treatment groups were given with an average of 7 patients. After the first group of 7 patients, a waitlist-control group was added, consisting of a waitlist period of 16 weeks before starting the CBT group-treatment.

The second sample consisted of patients with only OCD, who participated in our regular CBT group-treatment. To compare the modified CBT group-treatment with the regular CBT group-treatment, patients were matched with the data from regular CBT. The regular CBT group-treatment comprised of 20 selected patients from a data set (N= 168) who met the criteria for only OCD. Patients were selected through a matching process according to baseline-symptom severity, age and gender.

Measurements

Patients for modified CBT group-treatment were screened through an intake assessment by trained clinicians. The primary diagnosis was OCD. If patients met the inclusion criteria, a series of questionnaires was taken. These series of questionnaires includes: Yale-Brown Obsessive-Compulsive Scale (Y-BOCS; Goodman et al., 1989), The Manchester Short Assessment of QoL (MANSA; Priebe, Huxley, Knight, & Evans, 1999), Autism-Spectrum Quotient (AQ; Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001), and Hamilton Rating Scale for Depression (HRSD; Hamilton, 1960). These measurements were used to establish a baseline, at start of the waitlist-control condition (T0), at start of treatment (T1), post-treatment (T2) and follow-up (T3). Between all 4 measurement

points is a period of 16 weeks. Patients of the regular CBT group-treatment who met the inclusion criteria were assessed by trained clinicians before the start of the treatment as usual (T1) and post-treatment (T2). The Y-BOCS and AQ were administrated. Between the two measurement points is a period of 16 weeks. Y-BOCS severity rating was the primary outcome measure.

The Y-BOCS test yields a main score for OCD severity and includes 10 items. Y-BOCS is a clinical rating scale. It is administered as a semi-structured interview designed to measure OCD-symptoms. All items were rated between 0 (no symptoms) to 4 (extreme symptoms), subdivided into two subscales, obsessive and compulsive symptoms (Goodman et al., 1989). The questionnaire includes descriptions of 'time spend on obsession.' Y-BOCS is the golden standard for assessing the severity of obsessive and compulsive symptoms in adults (Goodman et al., 1989). A Y-BOCS total score between 0-7 indicate no OCD-symptoms, scores between 8-15 indicate mild OCD-symptoms, scores between 15-25 indicate moderate OCD-symptoms and scores between 25-40 indicate severe OCD-symptoms (van Oppen, Emmelkamp, van Balkom, & van Dyck, 1995). A reduction of ≤35% on the Y-BOCS total score indicates treatment response. A Y-BOCS total score of ≤12 during at least 1 week implies remission (Farrell, Waters, Milliner, & Ollendick, 2012). The secondary outcome in treatment was a significant change on the MANSA. This is a 16 questions instrument assessing QoL. It is a short version of the Lancashire Quality of Life Profile (Oliver, Huxley, Priebe, & Kaiser, 1997). All items were rated on a 7-point scale (1 = negatively extreme and 7 = positively extreme). The questionnaire includes questions addressing the satisfaction with different aspects of life, for example, 'how satisfied are you with your life as a whole today?' The reliability and validity of the MANSA was good (Priebe, Huxley, Knight, & Evans, 1999). Autistic traits were assessed using AQ. AQ is a 50 questions self-assessment instrument, designed to screen autistic traits. All items were rated between 0 (definitely agree) to 4 (definitely disagree). The questionnaire includes questions like for example, 'I prefer to do things with others rather than on my one.' The reliability and validity were good (Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001). HRSD is a 17-item clinical rating scale to assess depressive symptoms. Response choices were rated on a 4-point of 2-point scale. Total scores of questions range between 0 and 52 (Hamilton, 1960). The questionnaire includes questions like for example, 'have you had self-reproach or quilt?' Scores on the HRSD are a reliable and valid indicator of depressive symptoms.

Treatment

Modified treatment: All 20 OCD patients with co-morbid ASD received modified CBT group-treatment that involved 16 weekly sessions, which included CBT and ERP. To improve treatment, the last two groups of patients also received psychomotor therapy (PMT). All sessions were run according to a protocol, delivered by experienced therapists and psychologists. All patients had the same therapists. Modified treatment distinguishes itself from the regular treatment by setting smaller goals, using more individual guidance, having a closed group, having a personal coach to implement the learned at home considering the generalization problem. Also, each part of treatment had two therapists: an ASD specialist and an OCD specialist. The aim in treatment was reducing OCD-symptoms and not reducing the specific interest (Schuurman & Shiboleth, 2011). After treatment there was an aftercare process, once a month (follow-up).

Regular treatment: All OCD patients received regular CBT treatment. The regular CBT group-treatment is Treatment As Usual (TAU) for 16 weeks, which includes CBT and EPR. TAU is a weekly open group with eight patients.

Data analyses

IBM SPSS statistics (Version 24.0) was used for all analyses. Statistical significance was defined as $p < 0.05$. First, we used descriptive statistics to examine pre-treatment demographic variables and tested if there were significant differences between the OCD-ASD group and OCD group. We used independent t-tests, Mann-Whitney U tests (non-normally distributed continuous variables) and chi-square tests to consider any pre-treatment differences between groups on symptom severity scores, age and gender. Second, a between-groups multivariate analysis of variance (MANOVA) was used to determine if there were any pre-treatment difference between the Y-BOCS subscales severity score (obsessive and compulsive symptoms). If there were any significant differences, an independent t-test was conducted to find out which subscales differ. This way the follow-up univariate independent t-tests are thought to be protected by the (overarching) MANOVA.

In the two main analyses, the efficacy of modified CBT group-treatment was tested by comparing changes in Y-BOCS total score. Within-group change between waitlist condition (T1), pre-treatment (T2), post-treatment (T3) and after 16 weeks of follow-up was analyzed with one-way repeated measures ANOVA. Using a post hoc comparison to find out which measurements within the modified group were significantly different from one another.

The same analysis was applied for the MANSA. To calculate effect size, Cohen's *d*, based on mean differences and pooled standard deviations, was used.

The efficacy of modified CBT group-treatment is examined by comparing the results with regular CBT group-treatment. The difference at pre- and post Y-BOCS score was used as dependent variable. An independent t-test was conducted to compare the difference in score between groups. We expected the two groups to reduce the scores on the Y-BOCS, equally well. To demonstrate non-inferiority of the two groups, we computed the 95% confidence interval of the difference between groups. Using this method, the OCD-ASD group is not inferior to the OCD group at a 2,5% level if the upper boundary is below a predefined margin of non-inferiority, in this case 4 units on the Y-BOCS (Jones, Jarvis, Lewis, & Ebbutt, 1996). If the results from the OCD-ASD group and OCD-group analyses were different, this result was defined as inconsistent. We calculated that 10 patients per treatment group would provide 80% power to detect a non-inferiority margin of 2,5% using a two-side α of 0.05. This study includes 20 patients per treatment group, this means $n = 10$ (50%) drop out range. Effect sizes were calculated using Cohen' *d,* based on mean differences and pooled standard deviations.

As part of explorative analyses, a hierarchical multiple regression analyses was performed to examine if the following pre-treatment patient characteristics can predict the efficacy of the modified CBT group-treatment: age, Y-BOCS score, HRSD score and AQ score. The treatment efficacy, defined by Y-BOCS score (T2) is used as dependent variable. The pre-treatment (T1) score on the Y-BOCS is controlled by entering it first in the hierarchical equation.

Results

Descriptives

In total, 20 patients with OCD and co-morbid ASD were recruited for the modified CBT group-treatment. Three patients did not complete the modified CBT group-treatment (15%). Two patients discontinued the treatment after two weeks. The third participant completed 12 weeks of treatment. In regular treatment 20 OCD patients were matched with OCD-ASD patients. One patient discontinued the treatment after 5 weeks. Missing data was handled by carrying the last observation forward (LOCF). Each subject's last observation was taken as the endpoint. In cases where there was no available previous data to carry forward, subsequent data points were allowed to be missing in analyzes. Demographic and clinical characteristics of the sample are described in Table 1. Of all patients 80% was female ($n = 16$)

and 20% men (n = 4). As shown in Table 1, as intended, there were no significant differences between the two groups with respect to baseline severity of obsessive compulsive symptoms, gender and age. The mean of pre-Y-BOCS total score for both groups is 27, > 25 indicating severe OCD-symptoms. Results of an independent t-test showed that patients in the OCD-ASD group had a higher score on the AQ at pre-treatment (M = 29.83, SD = 7.12) relatively to patients in the OCD-group (M = 18.89, SD = 8.63). This difference was significant $t(28) = 3.64$, $p = .001$.

Relative to only OCD patients, at pre-treatment we expect more compulsive symptoms than obsessive symptoms in OCD-ASD patients. A between-groups MANOVA was conducted to compare OCD-ASD patients and OCD patients in obsessive and compulsive symptoms at pre-treatment. Preliminary assumption testing was conducted to check for normality, linearity, univariate and multivariate outliers and multicollinearity, with no serious violations noted. At pre-treatment (T1), there was no significant difference in obsessive and compulsive symptoms between OCD-ASD patients and OCD patients, $F(2, 32) = .99$, $p>.05$. Because no differences were found between OCD-symptoms the univariate independent t-test was not performed.

Table 1

Demographic and Clinical Characteristics of Patients at Pre-treatment

Characteristic	OCD-ASD group (n = 20)	Only OCD group (n = 20)	Test Value (df)	p
Age, mean (SD)	34.25 (8.24)	33.75 (9.15)	t = .182 (38)	.857
Gender				
Female, n (%)	16 (80)	16 (80)	$\chi 2$ = 0.00 (1)	1.000
Male, n (%)	4 (20)	4 (20)		
Y-BOCS Total score, mean (SD)	27.80 (5.21)	27.25 (4.61)	t = .354 (38)	.726
AQ Total score, mean (SD)[a]	29.83 (7.12)	18.89 (8.63)	t = 3.64 (28)	.001
MANSA, mean (SD)[b]	4.14 (.84)			
HDRS, mean (SD)[c]	15.13 (7.53)			

Note. t: independent sample t-test; $\chi 2$: chi-square test. SD = standard deviation; Y-BOCS = Yale-Brown Obsessive-Compulsive Scale; HRSD = Hamilton Rating Scale for Depression; AQ = Autism-Spectrum Quotient. [a] n = 30 patients completed the AQ, 12 OCD-ASD and 18

only OCD. [b] *n* = 8 OCD-ASD patients completed the MANSA. [c] *n* = 15 OCD-ASD patients completed the HDRS.

Effect of modified CBT group-treatment, within-group over time

It was expected that patients with OCD and co-morbid ASD benefit from modified CBT group-treatment in reducing OCD-symptoms. The efficacy of the modified CBT group-treatment was tested using a one-way repeated measures ANOVA, across four-time periods (waitlist-control, pre-treatment, post-treatment and follow-up). Mauchly's test indicated that the assumption of sphericity has not been violated, $\chi^2(5) = 9.63$, $p > .05$. The results of the first analysis indicate that the modified CBT group-treatment significantly affected the OCD-symptoms across different measurement points, $F(3, 33) = 11.79$, $p < .05$. The post hoc tests for the repeated-measures variable OCD-symptoms showed that OCD-symptoms were significantly lower at post-treatment (T2) compared to pre-treatment (T1) ($p = .050$), within-group effects size of 1.29 but not compared to waitlist-control condition (T0). The OCD-symptoms were significant lower at follow-up (T3) compared to waitlist-control condition (T0) ($p = .004$), within-group effect size of 1.23 and pre-treatment (T1) ($p = .003$), within-group effect size of 1.41. The OCD-symptoms at post-treatment (T2) were not significantly different to follow-up (T3) ($p = > .05$) (see Figure 1).

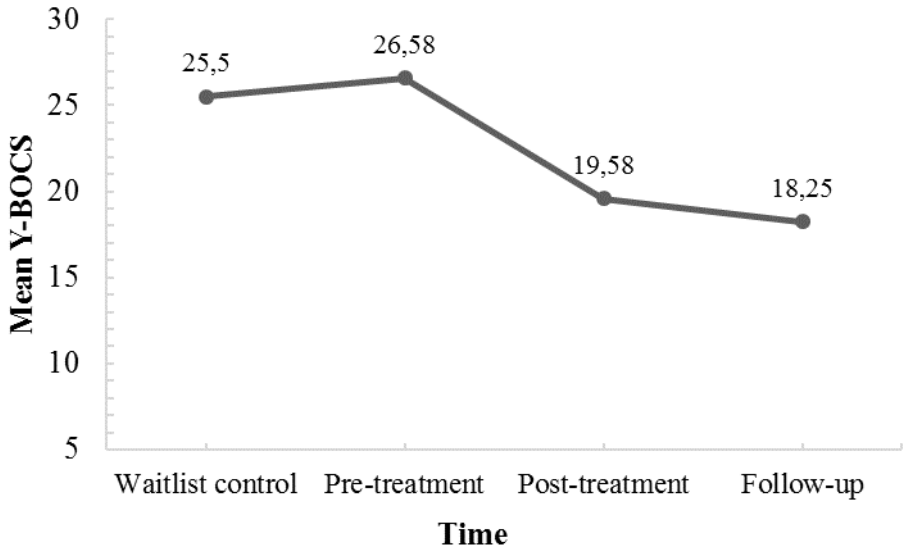

Figure 1. OCD-symptoms over time within group difference, modified CBT group-treatment.

We also expected that patients with OCD and co-morbid ASD do benefit from modified CBT group-treatment in improving QoL. The same analysis, one-way repeated measures ANOVA, was conducted to assess the improvement of QoL after the modified CBT group-treatment, across three-time periods (waitlist-control, pre-treatment, post-treatment). There was a significant main effect on the QoL by the different measurement points, $F(2, 8) = 7.43$, $p < .05$. Mauchly's test indicated that the assumption of sphericity has not been violated, $\chi^2(2) = 0.26$, $p > .05$. Post hoc tests for the repeated-measures showed that the QoL was significantly (see Figure 2) higher at post-treatment (T2) compared to waitlist-control condition (T0) ($p = .048$), within-group effect size of 1.35. Finally, the QoL at pre-treatment (T2) was not significantly different compared to the QoL at waitlist-control condition (T0) or post-treatment (T3) (both $p > .05$).

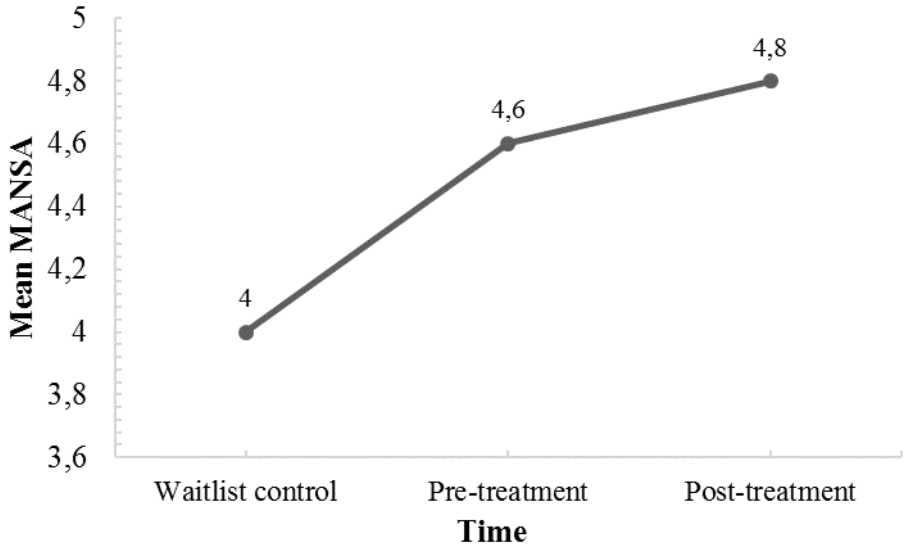

Figure 2. Quality of life over time within-group difference, modified CBT group-treatment.

Improvement following modified CBT group-treatment compared to regular CBT group-treatment

We expected modified CBT group-treatment as effective as regular CBT group-treatment. An independent t-test was conducted to compare the two CBT-groups (modified and regular) in OCD-symptoms score difference (pre-treatment-post-treatment). There was no significant difference between two groups $t(38) = -1.11$, $p < .05$. However, on average, OCD patients improved more resulting in reduced OCD-symptoms ($M = 12.94$, $SD = 7.75$) than OCD-ASD patients ($M = 10.60$, $SD = 7.34$).

On the 95% CI of Y-BOCS total score difference between pre- and post-Y-BOCS total score is more than 4 units (-8.17 to -2.41), above the predefined non-inferiority margin. This suggests, despite there is no significant difference, that treatments are not equivalent. Table 2 shows, the means and standard deviation for both groups, the mean difference, 95% confidence intervals and effect sizes.

Table 2

Between-group Difference, Score Difference on Y-BOCS Total, Y-BOCS Obsessive and Compulsive Symptoms

	Difference Y-BOCS score, mean (*SD*)					
Scale	OCD-ASD[a]	OCD[b]	*t*(32)	*p*	95% CI	Cohen's *d*
Y-BOCS Total score	10.06 (7.34)	12.94 (7.75)	-1.11	.274	[-8.17, 2.41]	- .70
Obsessive symptoms	4.56 (3.37)	6.11 (4.09)	-1.20	.240	[-4.18, 1.09]	- .41
Compulsive symptoms	5.50 (4.20)	6.83 (4.13)	-.93	.358	[-4.25, 1.58]	- .32

Note. Y-BOCS = Yale-Brown Obsessive-Compulsive Scale; *SD* = standard deviation; CI = confidence interval.

n^a = 16 patients completed subscales in the OCD-ASD group; n^b = 18 patients in OCD-group.

Response and remission rates modified- and regular CBT group-treatment

The response and remission rates were calculated for the modified CBT group-treatment. Of all 20 OCD-ASD patients, 10 patients (56%) showed good treatment response (> 35 % symptom reduction) and 2 patients (11%) met the criteria for remission at the end of treatment (Y-BOCS ≤ 12). The response and remission rates were also calculated for the regular CBT group-treatment. Of all 20 OCD patients, 14 patients (70%) showed good treatment response (> 35 % symptom reduction) and 10 patients (50%) met the criteria for remission at the end of treatment (Y-BOCS ≤ 12). Table 3 showed, at post-treatment an average Y-BOCS total score of 19.26 for OCD-ASD patients, which means a moderately severe score. OCD patients show an average Y-BOCS total score of 13.63, which means mild

symptoms (van Oppen et al., 1995). Figure 3 showed the pre- and post-Y-BOCS score between the OCD-ASD patients and OCD patients.

Table 3

Between-group Pre-treatment and Post-treatment, Mean on Y-BOCS Total, Y-BOCS Obsessive and Compulsive Symptoms

Scale	OCD-ASD		Only OCD	
	Pre-treatment	Post-treatment	Pre-treatment	Post-treatment
Y-BOCS total, mean (SD)	28.71 (4.7)	19.26 (7.64)	26.56 (4.31)	13.63 (8.12)
Obsessive symptoms, mean (*SD*)	13.88 (2.93)	9.74 (3.68)	12.83 (2.38)	6.74 (3.68)
Compulsive symptoms, mean (*SD*)	14.82 (2.04)	9.53 (3.98)	13.72 (2.76)	6.89 (4.71)

Note. Y-BOCS = Yale-Brown Obsessive-Compulsive Scale; *SD* = standard deviation.

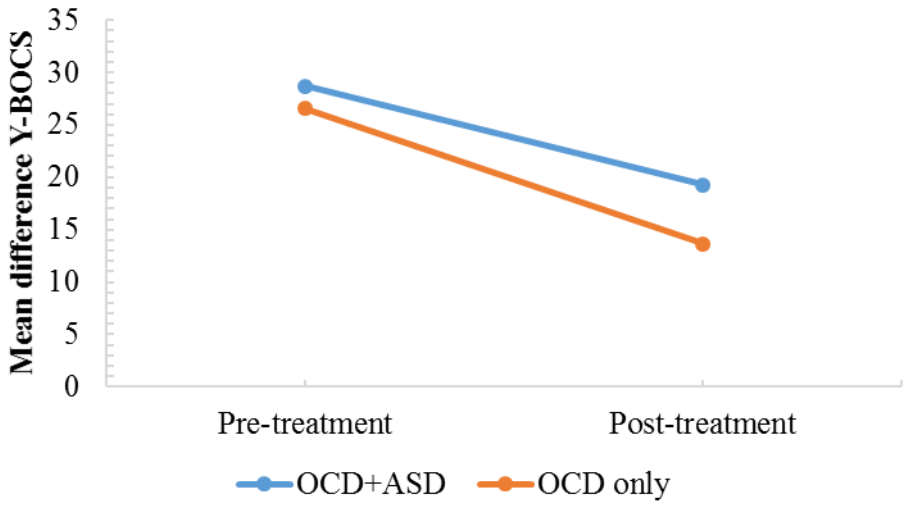

Figure 3. Pre- and post- Y-BOCS mean difference scores between-groups, OCD+ASD and OCD patients.

Predictors of the modified group-CBT, within-group

Explorative, we expected a high score on pre-treatment patient characteristics (such as severity of depression-, ASD-symptoms and a low score on QoL) to be negatively related to the efficacy of modified CBT group-treatment. In the explorative analysis, a hierarchical multiple regression was conducted to assess the ability of pre-treatment patient characteristics to predict the efficacy of the modified CBT group-treatment, after controlling for pre-treatment OCD-severity. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. A hierarchical multiple regression analysis showed that there were no statistically significant predictors for the T3 Y-BOCS, controlling for pre-treatment OCD-severity. Table 4 presents the beta values, standard errors and standardized betas.

Table 4

Hierarchical Multiple Regression Analyses Predicting Pre-treatment Factors From T3 Y-BOCS Total Score in the Modified CBT Group-treatment (n = 12)

Measure	*B*	*SE B*	*β*
Step 1			
Constant	0.95	9.74	
T1 Y-BOCS	0.59	0.33	.49
Step 2			
Constant	11.43	11.66	
T1 Y-BOCS	0.58	0.33	.48
T1 HRSD	0.18	0.24	.23
T1 AQ	-0.43	0.27	-.47

Note: $R^2 = 0.24$ for Step 1, $R^2 = 0.16$ for Step 2 ($p < .001$). Y-BOCS = Yale-Brown Obsessive-Compulsive Scale; HRSD = Hamilton Rating Scale for Depression; AQ = Autism-Spectrum Quotient.

* $p < .001$.

Discussion

The current study is one of few studies to determine the efficacy of OCD treatment modified for OCD patients with co-morbid ASD. Therefore, this study has unique data about treatment for OCD-ASD patients. Questions were: 1) Is modified CBT group-treatment for

OCD as effective for OCD patients with co-morbid ASD compared to the waitlist-control condition? 2) Is there a difference in effectiveness between modified CBT group-treatment and regular CBT group-treatment?

The results from this study are encouraging. As expected, OCD-symptoms in patients with co-morbid ASD reduce after 16 weeks of modified CBT group-treatment. This finding supports the results of Russell et al. (2009) and Murray et al. (2015) that CBT group-treatment with some adaptions is an effective treatment for this population. Results also indicate that OCD-symptoms remain stable during waitlist-control and pre-treatment but decrease after treatment. These findings imply that modified CBT group-treatment is an appropriate treatment for OCD-symptoms in patients diagnosed with OCD and co-morbid ASD. Including this treatment in the treatment protocol may thus contribute to a lack of treatment services, specifically for this target group.

QoL is improved after patients with OCD and co-morbid ASD receive modified CBT group-treatment. These findings support those of previous studies (Bejerot, 2007; Simonoff et al., 2008), in which QoL is being addressed as an important factor for determining the efficacy of a treatment. The results are partially in line with the second hypothesis that QoL will improve after treatment: QoL is indeed improved after treatment compared to the waitlist-control condition. However, there is no obvious difference in QoL improvement between pre-treatment and post-treatment. In the current study, it is not clear which factors cause the QoL improvement. One explanation could be the small sample size of this study. Another explanation could be that QoL is not so much related to the reduction of symptoms, but could be more related to the well-being of patients and the need for patients to be heard in his complaints (Mans, 2015). Further research could investigate more of the concept of QoL to determine what improves the QoL.

However, modified CBT group-treatment was not equivalent to regular CBT group-treatment in patients without ASD. Modified treatment shows a decrease of severe OCD-symptoms to moderate OCD-symptoms. Regular treatment shows a decrease of severe OCD-symptoms to mild symptoms. This finding did not support the findings that regular CBT group-treatment adapted with seven recommendations for ASD works just as well as the regular treatment for patients with OCD without ASD (Kan, 2013; Bruin, 2004; Attwood, 2006). This finding may differ because 7 adapted factors are not enough to have equally good results as regular treatment. Follow-up research will show if any other adjustment is needed so that treatment is as good as for OCD patients without ASD. Another explanation could be

that patients with co-morbid ASD are more complex and this level of improvement is already a big improvement. Further research could compare the result of the modified treatment with OCD-ASD in regular treatment to compare the degree of improvement.

Explorative at pre-treatment, no differences were found in the level of obsessive and compulsive symptoms compared to the regular CBT group-treatment. These findings differ from the results of previous studies (McDougle et al., 1995), in which patients with autistic traits endorse more compulsive symptoms than obsessive symptoms, compared to patients with only OCD. These results do not support the third hypothesis that, in comparison with OCD patients only, we expected more compulsive symptoms than obsessive symptoms in OCD-ASD patients at pre-treatment. This could be attributed to the manner of measurement in the current study. In this study, a distinction is made between compulsive and obsessive symptoms, but no difference is made in subcategories within these symptoms, such as cleaning, checking and counting. Further research could investigate whether there is a difference between the two patient's groups by looking specifically at the different subcategories of obsessive and compulsive symptoms.

Also, explorative results did not support the finding that pre-treatment patient characteristics are related to the efficacy of the modified CBT group-treatment. These findings differ from the study of Abramowitz et al. (2000), in which patients with co-morbid depression and a high severity of OCD-symptoms showed less improvement compared to less depressed patients. These findings may differ, because patients in this study were not diagnosed with depression, they only showed signs of depression.

This study had several limitations. First, because this study is conducted with a small group of participants it has low power effect on the analysis. Therefore, a limited generalizability must be taken into account. Second, this study can be seen as a pilot study, which indicated there has been a number of changes to the protocol between the participants who received the treatment. One of the changes for example, is that in the first phase of the study there was no waitlist-control condition. Another example, is that PMT was added in the second round. Third, patients in this study were followed up for 16 weeks only, which precludes conclusion on the long-term efficacy. Fourth, a number of factors were not included in the current study, because this information was not available. Medication changes during the treatment for example, were not taken into account. Besides, duration of illness (age at onset) and any previous treatments prior to this study have not been checked. Finally, we used a waitlist condition as a control group. Although it is an added value that there is a control

group, this type of control group is the weakest. Further research that uses large samples is needed. Other facts that should be examined include controlling for medication and using a TAU for the same population instead of a waitlist condition.

Overall, the results of this study demonstrate that modified CBT group-treatment is effective in reducing OCD-symptoms in patients with OCD and co-morbid ASD. Furthermore, after treatment there is an improvement in QoL in relation to the waitlist-control condition. However, modified CBT group-treatment (response 56%) was not equivalent to regular CBT group-treatment in patients without ASD (response 70%). Following researchers should continue in order to optimize outcomes for modified treatment in OCD-symptoms with this complex target group.

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