

Impact of childhood maltreatment on obsessive-compulsive disorder symptom severity and treatment outcome

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ABSTRACT

Background: Preliminary evidence suggests childhood maltreatment to play a causal role in the development and maintenance of obsessive-compulsive disorder (OCD). However, both the effect of childhood maltreatment on the course of OCD treatment and the role of specific subtypes of maltreatment remain largely unknown.

Objective: This study aimed to investigate the relationship between childhood maltreatment and the severity and time course of OCD symptoms within a clinical sample of OCD patients ($N = 68$). We hypothesized that higher levels of childhood maltreatment in OCD patients would be associated with higher symptom severity and worse treatment outcomes.

Method: Assessments of childhood maltreatment, OCD symptomatology, and related variables were completed in a sample of OCD patients before and after inpatient treatment as well as at 6 month follow-up.

Results: Emotional abuse, sexual abuse and neglect were highly prevalent in our sample. Additionally, the severity of experienced childhood maltreatment was associated with higher OCD symptom severity, with the strongest association found for emotional abuse. Hierarchical linear models indicated that patients with childhood maltreatment showed higher OCD symptom severity at pre-treatment, post-treatment, and follow-up compared to patients without these experiences. However, childhood maltreatment did not moderate symptom improvement during treatment.

Conclusion: Thus, although childhood maltreatment is not related to treatment outcome, it is highly prevalent among OCD patients and childhood trauma survivors still show higher OCD symptom severity after treatment. Therefore, childhood maltreatment should be considered in psychological interventions in individuals with OCD.

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关键词

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Impacto del maltrato infantil en la severidad de la sintomatología de trastorno obsesivo-compulsivo y resultados de tratamiento

Antecedentes: Evidencia preliminar sugiere que el maltrato infantil (MI) juega un rol causal en el desarrollo y mantenimiento del trastorno obsesivo-compulsivo (TOC). Sin embargo, el efecto del MI en el curso del tratamiento del TOC y el rol de subtipos específicos de MI persisten siendo ampliamente desconocidos.

Objetivo: Este estudio apuntó a investigar la relación entre el MI y la severidad y evolución de la sintomatología de TOC en una muestra clínica de pacientes con TOC ($N=68$). Planteamos como hipótesis que altos niveles de MI en pacientes con TOC podrían estar asociados con mayor severidad en la sintomatología y peores resultados de tratamiento.

Método: Se realizaron evaluaciones de MI, sintomatología de TOC, y variables relacionadas en una muestra de pacientes con TOC antes y después de tratamiento hospitalario así como también a los 6 meses de seguimiento.

Resultados: Abuso emocional, abuso sexual y negligencia fueron altamente prevalentes en nuestra muestra. Adicionalmente, la severidad de MI experimentado se asoció con mayor severidad en la sintomatología de TOC, con mayor asociación encontrada para abuso emocional. Modelos lineales jerarquizados indicaron que los pacientes con MI mostraron mayor severidad de sintomatología de TOC antes y después de tratamiento, así como a los 6 meses de seguimiento, en comparación a los pacientes sin MI. Sin embargo, el MI no moderó la mejoría de los síntomas durante el tratamiento.

Conclusión: Aunque el MI no está relacionado con el resultado de tratamientos, es altamente prevalente en pacientes con TOC y los sobrevivientes a MI muestran mayor severidad en la sintomatología de TOC aun después del tratamiento. Por lo tanto, el MI debería ser considerado en intervenciones psicológicas en individuos con TOC.

童年期虐待对强迫症症状严重程度和治疗结果的影响

背景: 初步证据表明, 童年期虐待 (CM) 在强迫症 (OCD) 的发展和维持中起因果作用。然而, CM对OCD治疗过程的影响以及对CM特定亚型的作用很大程度上仍是未知的。

目标: 本研究旨在一个OCD患者的临床样本 (N = 68) 中, 考查CM与OCD症状严重程度和时程之间的关系。我们假设OCD患者中较高的CM水平与较高的症状严重程度和较差的治疗结果相关。

方法: 在住院治疗前后及出院后6个月的随访中, 对OCD患者样本进行了CM, OCD症状学及其相关变量的评估。

结果: 我们样本中情感虐待, 性虐待和忽视非常普遍。此外, CM经历的严重程度与较高的OCD症状严重程度相关, 其中情感虐待的关联最强。分层线性模型表明, 与无CM的患者相比, 有CM的患者在治疗前, 治疗后和随访中表现出更高的OCD症状严重程度。但是, CM对于治疗期间症状的改善并无调节作用。

结论: 所以尽管CM与治疗结果无关, 但它在OCD患者中非常普遍, 并且CM幸存者在治疗后仍表现出较高的OCD症状严重程度。因此, 在OCD患者的心理干预中应将CM纳入考虑。

1. Introduction

The experience of childhood maltreatment, defined as emotional, physical and sexual abuse, or emotional and physical neglect, increases the risk of developing physical illness (Clemens et al., 2018) or mental disorders in adulthood (Cohen, Brown, & Smaile, 2001) and is associated with substantial costs to the individual and society (Magruder, McLaughlin, & Elmore Borbon, 2017). Previous research investigating the role of childhood maltreatment in the development of psychopathology has mostly focused on mental disorders such as posttraumatic stress disorder (PTSD), affective disorders, personality disorders, and substance use disorder (Cohen et al., 2001; Norman et al., 2012). There is also preliminary evidence that child abuse and neglect plays a role in the development and maintenance of obsessive-compulsive disorder (OCD), but this evidence is limited and inconsistent. Although increased prevalence rates of childhood maltreatment among patients with OCD compared to controls have been found in the majority of previous studies (Carpenter & Chung, 2011; Caspi et al., 2008; Fricke, Köhler, Moritz, & Schäfer, 2007; Grisham et al., 2011; Hemmings et al., 2013; Lochner et al., 2002), other studies – all with large sample sizes and thus adequately powered – did not find heightened prevalence rates for any kind of childhood trauma in OCD patients (e.g. Grabe et al., 2008; Voderholzer et al., 2014). Moreover, especially findings regarding the subtypes of childhood maltreatment are inconsistent across studies. For example, increased rates of *sexual abuse* among patients with OCD have been found in some studies (Caspi et al., 2008; Fricke et al., 2007; Grisham et al., 2011), but not others (Carpenter & Chung, 2011; Grabe et al., 2008; Lochner et al., 2002; Voderholzer et al., 2014). Elevated levels of *emotional abuse* and/or *emotional neglect* among patients with OCD have been found more consistently (Carpenter & Chung, 2011; Fricke et al., 2007; Hemmings et al., 2013; Lochner et al., 2002). However, not all studies have differentiated between various subtypes.

In a similar vein, only few studies have examined whether the experience of maltreatment is related to the severity of OCD symptoms. Results from studies in sub-clinical samples have mostly supported such a link. Higher levels of childhood maltreatment were associated

with increased OCD symptom severity in two large college student samples (Kroska, Miller, Roche, Kroska, & O'Hara, 2018; Mathews, Kaur, & Stein, 2008) as well as in a general population sample (Briggs & Price, 2009). However, in the latter study this link was fully mediated by current levels of anxiety and depression. With respect to clinical samples of patients with OCD, the results have been less clear. In a study including 120 patients with OCD, childhood trauma was associated with higher OCD symptom severity (Semiz, Inanc, & Bezgin, 2014). This was particularly the case for sexual, physical and emotional abuse, and emotional neglect. However, these findings did not control for multiple testing or potentially confounding factors such as anxiety or depression. Conversely, a number of studies involving patients with OCD have not found a relationship between levels of childhood maltreatment and OCD severity (Benedetti et al., 2012; Fricke et al., 2007; Selvi et al., 2012; Visser et al., 2014).

Clarifying the role of childhood traumatic experiences in OCD is important, in part because the presence or absence of a link between childhood trauma and severity of OCD may have clinical implications. OCD is one of the most chronic forms of psychopathology (Eisen et al., 2013; Skoog & Skoog, 1999; Visser et al., 2014), and one relevant clinical question is whether early traumatic experiences should be addressed in patients with OCD who do not respond to gold standard treatments such as exposure and response prevention. To date, there is only limited data on the impact of traumatic experiences on OCD treatment. Indirect evidence comes from two studies suggesting that a diagnosis of co-occurring PTSD in individuals seeking treatment for OCD leads to poorer treatment outcome (no change or a worsening of symptoms) than for individuals without a trauma history (Gershuny, Baer, Jenike, Minichiello, & Wilhelm, 2002; Gershuny, Baer, Radosky, Wilson, & Jenike, 2003). Moreover, in another study reductions in OCD symptoms during treatment were associated with an increase in PTSD symptoms (i.e. intrusions), which may suggest that OCD symptoms may be a coping strategy against PTSD symptoms (Gershuny et al., 2002). Importantly, however, both studies did not differentiate childhood abuse and neglect from other types of trauma of trauma

and did not investigate the impact of trauma on OCD treatment in the absence of PTSD symptoms.

To our knowledge, only two studies to date have directly investigated the association between childhood trauma and OCD treatment outcome. In the first study, increased rates of childhood maltreatment were found among treatment-resistant OCD patients compared to treatment responders, in particular for sexual, physical and emotional abuse, and emotional neglect (Semiz et al., 2014). Second in a small sample of patients with OCD ($N = 41$), patients with a history of childhood abuse and neglect showed higher symptom severity at the beginning and end of treatment than those without these traumatic experiences, although at the end of the treatment both groups were similarly improved (Fricke et al., 2007). Of note, both studies are limited by the lack of a follow-up interval.

The current study therefore aimed to replicate and extend previous findings concerning the role of childhood maltreatment within a severe OCD inpatient sample. First, we investigated levels of childhood maltreatment in a sample of patients with OCD and compared this to a general population sample. Second, we examined the relationship between the type and severity of childhood maltreatment and the severity of OCD symptoms, while controlling for levels of depression, anxiety and stress symptoms, as Briggs and Price (2009) had them to be confounding factors for this relationship. The third aim was to investigate the relationship between childhood maltreatment and treatment outcome at post-treatment and 6 month follow-up. We hypothesized that patients with OCD would show higher levels of childhood maltreatment in comparison to the general population (*Hypothesis 1*). Second, we expected higher levels of childhood maltreatment to be associated with higher OCD symptom severity, also while controlling for levels of depression, anxiety and PTSD (*Hypothesis 2*). In addition, we hypothesized higher levels of childhood maltreatment to be linked with worse treatment outcomes (*Hypothesis 3*). Additional exploratory analyses were conducted to investigate the influence of specific subtypes of childhood maltreatment on OCD symptom severity while controlling for levels of depression, anxiety, stress, and PTSD.

2. Method

2.1. Sample

Inclusion criteria for study participation were: (1) a primary diagnosis of OCD according to DSM-5 (American Psychiatric Association, 2013), and (2) age of legal majority. Exclusion criteria were being actively psychotic, demented, or currently abusing alcohol and/or drugs. During the period of one year we recruited a total of 70 patients; one patient did not meet inclusion criteria, leaving 69 patients who

provided written informed consent. One patient dropped out of the study due to premature discharge from the clinic. The final sample therefore comprised 68 participants. For the demographic and clinical characteristics of the sample see Table 1.

2.2. Assessments

Participants completed standardized clinical interviews and self-report measures. All interviewers were trained and monitored in the conduct of the assessment techniques by an experienced clinical psychologist.

2.2.1. Diagnoses of DSM-IV axis I disorders

Major DSM-IV Axis I diagnoses were examined using the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I), which is a well-validated semi-structured interview (First, Spitzer, Gibbon, & Williams, 2002; Wittchen, Wunderlich, Gruschwitz, & Zaudig, 1997). The Clinician-Administered PTSD Scale for DSM-5 (CAPS-5), a 30-item structured interview, was used to diagnose current (past month) PTSD (Schnyder, 2013; Weathers et al., 2013) with respect to any index trauma. For each symptom, standardized questions and probes are provided. Administration requires identification of an index traumatic event to serve as the basis for inquiry about the symptoms.

2.2.2. OCD symptom severity

OCD symptom severity and type were assessed via the Obsessive Compulsive Inventory – Revised (OCI-R) (Foa et al., 2002; Gönner, Ecker, & Leonhart, 2009). The OCI-R consists of 18 items comprising six subscales: Washing, Checking, Ordering, Obsessing,

Table 1. Demographic and clinical characteristics of the sample ($N = 68$).

	M	SD
Age in years	34.03	11.57
OCD symptom severity score [†] , pre-assessment	26.66	13.45
OCD symptom severity score [†] , post-assessment ($N = 62$)	19.5	12.72
OCD symptom severity score [†] , 6 months follow up ($N = 54$)	18.37	12.86
Days of hospitalization	68.77	17.3
	N	%
Gender (male)	30	44
Marital status (married)	13	19
OCD symptom types [†]		
Mixed OCD symptoms	50	73.5
Obsessing	46	67.5
Washing	40	59
Checking	38	56
Ordering	23	34
Mental neutralizing	19	28
Hoarding	15	22
Comorbid axis I disorders	46	67.5
Any mood disorder	28	41
Any anxiety disorder	33	48.5
Somatoform disorder	10	14.5
PTSD	11	16

Note. OCD, obsessive-compulsive disorder; PTSD, posttraumatic stress disorder.

[†]Measured with the Obsessive-Compulsive Inventory-Revised.

Hoarding, and Mental Neutralizing. The German version shows excellent internal consistency and satisfactory test–retest reliability, corresponds well with other measures of OCD symptoms, and distinguishes patients with OCD from those with other anxiety disorders and control participants (Gönner et al., 2009). The OCI-R showed good internal consistency across all measurement times in our sample (Cronbach's $\alpha = .85$).

2.2.3. Childhood maltreatment

Childhood maltreatment was measured using the Childhood Trauma Questionnaire – Short Form (CTQ) (Bernstein et al., 2003; Wingenfeld et al., 2010). The CTQ is a 28-item self-report inventory (25 clinical items and three validity items) that provides a brief, standardized, and well-validated instrument to retrospectively assess abuse and neglect (five subscales: emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect). The CTQ contains a number of statements (e.g., 'When I was growing up I didn't have enough to eat'), and the respondent is asked to answer on a 5-point Likert scale from 'never true' (1) to 'very often true' (5). Clinically significant levels of childhood trauma overall and of subtypes were determined using commonly accepted cut-offs for more than minimal (i.e., low, moderate, or severe) abuse or neglect (Bernstein et al., 2003). In our study, the internal consistency was good for the CTQ total score (Cronbach's $\alpha = .88$) as well as for most subscales (Cronbach's $\alpha > .87$), with the exception of a moderate reliability score for the physical abuse subscale (Cronbach's $\alpha = .59$) and an unacceptable internal consistency of the physical neglect subscale (Cronbach's $\alpha = .44$). Therefore, as recommended in the literature, the subscale physical neglect was excluded from all analyses since a reliable measure of the construct cannot be guaranteed (Klinitzke, Romppel, Hauser, Brahler, & Glaesmer, 2012; Streiner, 2003). The physical abuse subscale was interpreted as a moderately reliable scale (Hinton, McMurray, & Brownlow, 2004), considering that it consists of 5 items only (see Cortina, 1993). It was therefore not excluded from the analyses.

2.2.4. Depression, anxiety and stress symptoms

The short version of the Depression Anxiety Stress Scale (DASS-21) (Lovibond & Lovibond, 1995; Nilges & Essau, 2015) captures depression, anxiety, and stress over the past week using seven items per subscale, and is based on the three-component model of anxiety and depression (Clark & Watson, 1991). The depression scale asks about symptoms associated with dysphoric mood, e.g., sadness and feelings of worthlessness. The anxiety scale assesses physical hyperarousal and the stress scale captures tension and irritability. Items are rated on a four-level Likert scale ranging from 'Did not apply to me at all' (0) to 'Applied to me very much, or most of the time' (3). The DASS depression and anxiety scales have shown good

psychometric properties in previous research (Crawford et al., 2009).

2.3. Procedure

2.3.1. Treatment

All participants were patients receiving 8–12 weeks specialist inpatient treatment for OCD at the Clinic Windach (Germany). Psychological treatment was not fully standardized but followed a manual for evidence-based cognitive behavioural therapy (CBT) for OCD (Tominschek, Zaudig, Mehl, Vant, & Hauke, 2016). The treatment included 300 minutes per week OCD group therapy (main component: Exposure and Response Prevention) and 50 minutes per week individual therapy based on individual topics or case formulation. Besides, patients received 100 minutes per week mindfulness group therapy and sports therapy or art therapy. The group size was between 8–10 patients per group with one psychotherapist and one co-therapist (specialized trained nurse). At the beginning of the treatment, all patients had to agree to do a therapist-guided flooding exercise after a stay of about two third of the time and to do additional weekly exposure exercises. In addition, some patients additionally received pharmacological treatment according to German S3 guidelines (Hohagen, Wahl-Kordon, Lotz-Rambaldi, & Mucbe-Borowski, 2014); however, psychological treatment remained the main focus for all patients.

2.3.2. Testing

In the first two weeks after admission, patients were asked to participate in this study. After having provided written informed consent, participants were interviewed with the SCID-I to establish diagnoses of OCD and comorbid axis I disorders. In addition, the CAPS-5 was conducted to assess diagnostic criteria and symptom severity of PTSD according to the DSM-5 criteria. PTSD was assessed with respect to any index trauma and not restricted to childhood maltreatment. At admission, information about sex, age and socio-economic status was collected. Further information was gathered from self-report questionnaires (OCI-R, CTQ). Patients also completed a number of additional questionnaires and interviews that are unrelated to the current analysis and will be reported elsewhere. One week before discharge and 6 months later participants completed the OCI-R online, using the Unipark platform (www.unipark.com). The study was approved by the Research Ethics Committee of the Department of Psychology at LMU Munich.

2.4. Statistical analyses

Analyses were carried out in SPSS Statistics version 24 and in R for Windows, v3.4.3. To test Hypothesis 1, the prevalence of childhood maltreatment in the sample was computed and compared

via t-tests to a representative German population sample (Klinitzke et al., 2012), which was comparable in age and gender distribution ($M = 50.6$ $SD = 18.6$ age in years; 46.8% male). Relationships between childhood maltreatment and OCD symptom severity were examined via Pearson correlations (Hypothesis 2). To control for depression, stress, anxiety and PTSD, partial correlations were used. To explore the impact of the specific subtypes of childhood trauma on OCD symptom severity, a multiple regression analysis was conducted with OCD symptom severity at pre-assessment as the dependent variable. The subscales emotional and physical abuse, emotional neglect and sexual abuse were entered into the model sequentially in the order of the magnitude of their correlation with OCD symptom severity. Because of the weak linearity of the subscales of the CTQ, the regression model is reported with log transformed predictors. In addition, partial correlations were used to control for depression, stress, anxiety and PTSD. In order to test Hypothesis 3, we examined the course of OCD symptom severity across the three assessments (pre-treatment, post-treatment and 6 months follow-up). The proportion of missing data for the OCI-R was 9% at post-treatment and 21% at follow-up. Missing data were not replaced. We estimated a two-level multilevel linear model with random intercepts and random slopes. OCD symptom severity served as the dependent variable and was predicted by time (Level 1, within-subject), CTQ score (grand mean centred, Level 2, between-subjects), and their cross-level interactions. The model was estimated using the package lme4 (Bates, Maechler, Bolker, & Walker, 2015). In addition, clinically significant change (Jacobson & Truax, 1991) was computed according to whether (a) patients showed reliable change (defined as a reliable change index (RCI) > 1.96) and (b) whether their OCD symptoms were below the clinical cut-off (<19) at post and follow-up measurement. To examine whether clinically significant change was related to childhood maltreatment, point-biserial correlations were calculated. The level of significance was set to $\alpha = 0.05$ (two-tailed). We calculated a-priori a necessary sample size with G*power (V. 3.1; Faul, Erdfelder, Buchner, & Lang, 2009) of approximately 70 participants, assuming a medium effect size ($f^2 = 0.15$), power of .85, and α of .05.

3. Results

3.1. Prevalence of childhood maltreatment among patients with OCD

As shown in Table 2, approximately two thirds of the sample indicated experience of some type of child abuse and neglect in the clinical range, with nearly 80% of those

Table 2. Prevalence of childhood maltreatment in the OCD patient sample ($N = 68$) compared with a German population sample $N = 2500$ (Klinitzke et al., 2012).

CTQ Subscale	Childhood maltreatment n (%) [†]	CTQ M (SD)	Population sample CTQ M (SD) [#]	t (df)	p value	g_{Hedges}	95% CI g_{Hedges} [LL, UL]
Emotional abuse	38 (55.9)	10.53 (5.20)	6.49 (2.60)	6.39 (67.91)	$p < .001$	1.50	[1.25, 1.74]
Physical abuse	9 (13.2)	5.94 (1.82)	5.88 (2.18)	.27 (72.33)	$p = .79$.03	[-.21, .27]
Sexual abuse	22 (32.4)	6.42 (3.12)	5.45 (1.66)	2.55 (68.04)	$p < .05$.56	[.32, .80]
Emotional neglect	52 (76.5)	13.34 (4.76)	10.05 (4.23)	6.31 (2566)	$p < .001$.78	[.53, 1.02]
Total	46 (67.6)	43.38 (12.31)					

Note: OCD, obsessive-compulsive disorder; CTQ, Childhood Trauma Questionnaire.

[†]Number of patients above CTQ cut-off scores for more than minimal level of childhood maltreatment severity according to (Bernstein et al., 2003).

[#]Comparison data derived of a German normal population sample $N = 2500$ (Klinitzke et al., 2012).

with traumatic experiences reporting more than one subtype ($N = 54$). A comparison of CTQ scores of our OCD sample to the representative German population sample (Klinitzke et al., 2012) showed that patients with OCD reported a significantly and substantially higher severity of emotional abuse ($g = 1.50$), emotional neglect ($g = .78$), and sexual abuse ($g = .56$), but not physical abuse ($g = .03$).

4. Relation between childhood maltreatment and OCD symptom severity

In line with our hypotheses, there was a positive correlation between overall childhood maltreatment (CTQ total score) and OCD symptom severity at baseline ($r = .34$, $p < .001$). The correlation remained unchanged when controlling for DASS-21 depression ($r = .25$, $p < .05$), anxiety scores ($r = .27$, $p < .05$) or CAPS-5 PTSD status ($r = .30$, $p < .05$). However, entering the DASS-21 stress score as a control variable rendered the link between CTQ and OCI-R non-significant ($r = .22$, $p = .08$).

To explore which subtypes of childhood trauma were especially predictive of OCD symptom severity, a multiple regression was conducted. Multicollinearity was in no case a concern ($VIFs < 1.98$; for an overview of Spearman correlations among the four predictors, see Table 3). Since emotional abuse showed the largest correlation with the OCI-R (see Table 3), it was inserted into the model in the first step. This was followed by physical abuse in Step 2, emotional neglect in Step 3, and sexual abuse in Step 4. The regression analyses revealed that in Step 1 emotional abuse significantly predicted OCD symptom severity, $F(1, 66) = 8.36$, $p < .01$, accounting for 11.2% of the variance in OCD symptom severity ($\beta = .34$). However, physical abuse, emotional neglect and sexual abuse did not provide any additional predictive power for OCD symptom severity when entered into the equation in Steps 2–4 ($ts < 1.21$, $ps > .23$; see Table 4),

Table 3. Spearman Correlations between the seven proposed predictors of OCD symptom severity at t1 (pre-assessment).

Measure	1	2	3	4	5	6	7	8	9
1. Emotional abuse	-								
2. Physical abuse	.46***	-							
3. Sexual abuse	.21	.37**	-						
4. Emotional neglect	.69***	.29*	.21	-					
5. Depression	.30*	.23	.35**	.27*	-				
6. Anxiety	.18	.20	.19	.07	.54***	-			
7. Stress	.33**	.28*	.24*	.19	.57***	.68***	-		
8. PTSD	.23	.26*	.01	.19	.19	.26*	.43**	-	
9. OCD symptom severity	.38**	.27*	.10	.22	.31**	.35**	.45***	.27	-

Note. OCD, obsessive-compulsive disorder; PTSD, posttraumatic stress disorder.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4. Multiple regression model predicting OCD symptom severity from subtypes of childhood maltreatment.

Predictors	R^2	R^2 Change	B	$SE B$	β
Step 1	.11**	.11**			
Intercept			5.31	7.55	
Emotional abuse			9.52**	3.30	.34
Step 2	.13*	.02			
Intercept			-5.64	11.79	
Emotional abuse			7.82*	3.57	.28
Physical abuse			8.45	7.00	.15
Step 3	.13*	.00			
Intercept			-5.16	13.67	
Emotional abuse			8.03	4.65	.28
Physical abuse			8.43	7.06	.15
Emotional neglect			-0.36	5.14	-.01
Step 4	.13	.00			
Intercept			-4.79	14.44	
Emotional abuse			8.04	4.70	.28
Physical abuse			8.61	7.41	.16
Emotional neglect			-0.34	5.19	-.01
Sexual abuse			-0.44	5.03	-.01

Note. OCD, obsessive-compulsive disorder. Predictors are log-transformed.

* $p < .05$, ** $p < .01$.

nor was the change in R^2 of the Steps 2–4 significant ($F_s < 1.46$, $ps > .23$).

In a series of partial correlation analyses, the link between emotional abuse and OCD symptom severity was examined controlling for other symptom measures. When controlling for CAPS-5 PTSD, the correlation between emotional abuse and OCD symptom severity remained significant ($r = .28$, $p < .05$). However, entering the DASS-21 depression score ($r = .23$, $p = .06$), the anxiety score ($r = .24$, $p = .05$) or the stress score ($r = .18$, $p = .15$) as a control variable all rendered the link between emotional abuse and OCI-R non-significant.

5. Treatment outcome

Childhood maltreatment was linked to OCD symptom severity after treatment ($r = .37$, $p < .01$) and after 6 months follow-up ($r = .38$, $p < .01$). The relationships remain significant after controlling for days of hospitalization (post treatment: $r = .30$, $p < .05$ and follow-up: $r = .39$, $p < .01$). Multilevel linear models showed a significant improvement in OCD symptoms in all patients over time (Table 5). In addition, childhood maltreatment was a significant predictor of higher symptom severity across all time points. However, no effect of childhood maltreatment on the course of treatment was found. Missing value analyses indicated no differences in dropouts versus completers, neither regarding OCD symptom severity nor towards levels of childhood trauma ($ts < .54$, $ps > .247$).

Fourteen patients (21%) showed reliable change from pre- to post-treatment ($RCI > 1.96$; one patient worsened), and 20 patients (37%; $N = 54$ at follow-up) showed reliable change from pre-treatment to 6 month follow-up. Eleven patients (18%) showed

Table 5. Multilevel linear model: Impact of childhood maltreatment on the course of OCD symptom severity across pre-treatment, post-treatment, and 6 month follow up.

	OCI-R				<i>t</i>	<i>p</i>
	<i>B</i>	95% <i>CI</i>	<i>SE</i>	<i>df</i>		
Fixed effect						
(Intercept)	25.92	22.97–28.88	1.51	65.96	17.20	<.001
Time	–4.70	–6.02 – –3.38	.67	54.7	–6.97	<.001
CTQ	.34	.10–.58	.12	65.81	2.77	<.01
Time x CTQ	–0.01	–0.12–0.10	.06	55.37	–.18	.861
Random effect						
σ^2		47.02				
$\tau_{00, id}$		114.26				
$\tau_{11, time}$		2.74				
ρ_{01}		–.37				
N_{id}		68				
ICC_{id}		.71				
Observations		184				
AIC		1382.83				

Note. OCD, obsessive-compulsive disorder; CTQ, Childhood Trauma Questionnaire; OCI-R, Obsessive-Compulsive Inventory-Revised.

clinically significant change, that is, both reliable change and a score below the clinical cut-off at post-treatment (13 patients (24%) at follow-up). However, point-biserial correlation analyses revealed no relationship between childhood maltreatment and reliable change or clinically significant change after treatment or follow-up ($r_b < .13$, $p > .32$).

6. Discussion

The present study investigated the role of childhood maltreatment in an inpatient sample of patients with severe OCD. Prior research has suggested an increased prevalence of childhood abuse and neglect among patients with OCD, and that it is associated with both increased OCD symptom severity and worse treatment outcomes. However, earlier research is limited by small sample sizes and inconsistent findings. Therefore, the current study aimed to replicate and extend these findings by using a carefully diagnosed sample, by assessing subtypes of childhood maltreatment, and by investigating the relationship between childhood maltreatment and the course of treatment. Three major findings emerged: First, we found increased rates of childhood maltreatment among patients with OCD compared to the general population. Second, childhood maltreatment severity was associated with higher OCD symptom severity, with the strongest association found for emotional abuse, including control for symptoms of depression, anxiety and PTSD. Finally, patients with higher levels of childhood maltreatment showed greater OCD symptom severity at pre-treatment, post-treatment, and after 6 months compared to patients without such experiences. However, childhood maltreatment did not moderate symptom improvement during treatment in our sample.

Our findings thus replicate previous results indicating a higher prevalence of childhood maltreatment

among patients with OCD (Carpenter & Chung, 2011; Caspi et al., 2008; Lochner et al., 2004). Overall, approximately two thirds of the OCD sample indicated some type of abuse and neglect, and most participants with a childhood trauma history reported more than one subtype. When looking at the specific subtypes, emotional neglect (76.5%) and emotional abuse (55.9%) were the most frequently reported. In particular, patients with OCD reported significantly higher levels of sexual abuse, emotional abuse, and emotional neglect than that found in the general population. Previous research had provided heterogeneous findings in relation to heightened prevalence of sexual abuse among patients with OCD (Carpenter & Chung, 2011; Caspi et al., 2008; Grabe et al., 2008; Grisham et al., 2011; Voderholzer et al., 2014), but more consistent findings with regards to heightened levels of emotional abuse and neglect (Carpenter & Chung, 2011; Fricke et al., 2007; Lochner et al., 2002). Our results support the positive findings with regards to all three subtypes.

The second aim of our study was to investigate the relationship between childhood maltreatment and OCD symptom severity, as hypothesized, higher levels of maltreatment were associated with increased OCD symptom severity. Importantly, this relationship remained even after controlling for levels of depression, anxiety and PTSD. These results replicated similar findings in non-clinical samples (Briggs & Price, 2009; Kroska et al., 2018; Mathews et al., 2008; Vidal-Ribas et al., 2015), as well as an earlier study in a large clinical sample (Semiz et al., 2014). However, the association between childhood maltreatment and OCD symptomatology was rendered non-significant when controlling for stress symptoms as assessed by the DASS. This subscale assesses chronic non-specific arousal and includes items focusing on difficulty relaxing, nervous arousal, and being easily upset or impatient. Several explanations for this finding are conceivable. For example, heightened chronic arousal may be a mediator between childhood maltreatment and OCD symptoms. Alternatively, the non-specific symptoms assessed via the DASS stress scale may be confounded with high symptom load and/or high distress experienced by the current symptoms. Future research should further examine the stability of this finding and further explore these possible explanations.

We furthermore found that the relationship between childhood maltreatment and OCD symptom levels was particularly pronounced for emotional abuse, supporting earlier findings in a large college student sample (Mathews et al., 2008). This suggests that although emotional trauma that does not meet DSM-5 criteria for a traumatic event, it may nevertheless play an important role in the development and maintenance of OCD. However, since the association no longer remains significant when symptoms of

comorbid depression, anxiety and stress are controlled, it is possible that this association is only mediated by these symptoms, mirroring similar findings in other anxiety and affective disorders (Gibb, Chelminski, & Zimmerman, 2007; Nelson, Klumpp, Doebler, & Ehring, 2018). Nevertheless, interpreting the results also considerable methodological problems have to take into account. One reason for the weaker relationship with physical and sexual abuse may be due to the fact that these variables are often skewed and have less variability. For example, only 9 patients were above the cut-off scores for physical abuse. This means that there may not sufficient variability in the physical abuse variable to examine its association with OCD symptoms. Therefore, the results of the present and also previous studies in the literature may underestimate the impact of physical and sexual abuse on OCD severity due to measurement limitations. Nonetheless, since this is an exploratory analysis the findings from this analysis should be regarded as very preliminary and need to be replicated before any firm conclusions can be drawn.

We finally tested the hypothesis that childhood maltreatment predicts poor treatment outcome. However, this was not supported by our data. Childhood trauma severity was associated with higher levels of OCD symptom severity at pre-treatment, post-treatment, and follow-up, but did not moderate symptom improvement. In order to investigate whether this might be due to a general low rate of improvement over treatment, we additionally examined the frequency of clinically significant change among the patients. Although there was a small to medium rate of clinically significant change during the course of treatment this was not linked to the severity of childhood maltreatment. Overall, patients with more traumatic experiences in childhood do not seem to benefit less from treatment, but they retain higher OCD symptom severity after treatment. Previous findings regarding the impact of childhood maltreatment on OCD treatment outcome have been mixed. On the one hand, our findings contradict results of another study showing more childhood traumatic experiences among treatment resistant OCD patients versus treatment responders (Semiz et al., 2014). On the other hand, our results are in line with an earlier study that also found more OCD symptom severity in OCD patients with childhood trauma experiences before and after treatment, however all patients had similar treatment benefit (Fricke et al., 2007). Several explanations for these divergent findings are possible. First, in Fricke et al. (2007) as well as in the present study detailed interviews were used asking patients with OCD about their experience of childhood maltreatment and the possible relationship between these experiences and their OCD symptoms. It cannot be ruled out that exploring traumatic experiences and their relationship with

OCD symptoms may have affected the subsequent treatment. In our study, many patients reported the assessment to be helpful and motivating to continue working on experiences of childhood trauma in treatment. As treatment was not fully standardized but followed an evidence-based CBT approach for OCD (Exposure and Response Prevention Therapy) that was delivered based on individual case formulation, it is possible that the detailed assessment of childhood maltreatment and its relationship with OCD may have led therapists and patients to consider these experiences during treatment to a higher degree than usual in OCD treatment. Further, it is probable that only a subgroup of childhood trauma survivors with OCD, i.e. those who suffer more from post-traumatic symptoms such as intrusions and nightmares benefits less from OCD symptom-focused therapy. More systematic research is clearly needed to unravel the processes underlying of the association between childhood maltreatment and OCD symptom severity and their impact on treatment.

Importantly, our findings support earlier evidence showing that even after treatment OCD patients with childhood maltreatment continue to show higher symptom levels of OCD than patients without these experiences. Therefore, it appears promising for future research to explore additional interventions for childhood trauma survivors in order to improve their treatment outcomes (Veale, Page, Woodward, & Salkovskis, 2015).

7. Limitations

Several limitations need to be taken into account when interpreting the study findings. First, as in most research in this area childhood maltreatment was assessed retrospectively and via self-report instruments. This can lead to recall bias on the occurred traumatic events. Nevertheless, studies showed the stability of self-report on childhood trauma of the CTQ even in the context of reduced psychopathology after psychotherapy (Bernstein et al., 2003; Paivio, 2001). Moreover, in a prospective study it has been found that the CTQ is a reasonable retrospective assessment of prospectively ascertained childhood trauma exposure (Liebschutz et al., 2018). Second, likewise in other reported studies investigating childhood trauma experiences on treatment effects we investigated an inpatient clinical sample with relatively high symptom severity. Therefore, the findings might not be generalized to a less severe outpatient population. Third, we were unable to control for some potentially confounding factors, such as the number of exposure sessions or concurrent psychopharmacological treatment. Fourth, we had to exclude the subscale physical neglect from the analyses, due to low reliability. The psychometric problems related to this particular subscale have often been highlighted in the literature (e.g. Klinitzke et al., 2012). The poor

psychometric properties of the physical neglect subscale may be due to ambiguous item phrasing, which sometimes appear too unspecific and not clearly distinguishable from other scales such as emotional neglect and emotional abuse (Wingenfeld et al., 2010). Moreover, the physical abuse subscale also showed relatively low reliability, which may limit the interpretation of the subscales. Although the CTQ can be regarded as the current gold standard measure of childhood maltreatment and is most commonly used in the literature, future research should aim to improve the reliability of assessing childhood trauma. Finally, data at 6 month follow-up was only available for 80% of the sample. Reassuringly, multilevel models do not require complete data sets, and missing value analyses showed that there were no differences regarding OCD symptom severity or levels of childhood maltreatment in the dropout versus completer group. Therefore, as missing data was random, the results seem unbiased and unaffected by missing values.

8. Conclusion

If replicated in future research, the findings have important theoretical and clinical implications. The findings of this study support earlier evidence showing that childhood trauma is related to heightened OCD symptom severity. This relationship could not be explained by the presence of symptoms of anxiety, depression, or PTSD. However, controlling for symptoms of non-specific chronic arousal reduced the relationship. Nevertheless, there is preliminary evidence that the association with OCD symptom severity may be especially pronounced for emotional abuse. The mechanisms linking childhood maltreatment to OCD remains to be understood in order to identify potential targets for interventions. From a clinical perspective, it appears promising to consider the link in psychological interventions of childhood trauma survivors with OCD. Potential interventions to be included in treatment approaches for this group may range from psychoeducation on the association between childhood maltreatment and OCD symptoms to the use of trauma-focused interventions aiming at processing the traumatic experiences. However, more research investigating the effect of child abuse and neglect on treatment outcomes among patients with OCD is clearly needed.

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