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RESEARCH

Executive Functioning, Family Accommodation, and Treatment Response in Youth with OCD and Comorbid ADHD in a Partial Hospital Program

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Abstract

Few studies have examined differential treatment response, rates of familial accommodation (FA), and executive functioning (EF) in youth with OCD vs. OCD + ADHD, particularly in a partial hospital program (PHP). The current study includes 138 youth diagnosed with OCD only and 102 youth diagnosed with OCD + ADHD in a PHP setting for a total sample of 240 youth (and their families). Families and clinicians completed several measures assessing child and parent variables of interest. Findings of ANCOVA analyses suggest poorer treatment response and EF in children with comorbid OCD + ADHD compared to their counterparts with OCD only. No significant differences emerged between groups in baseline levels of symptom severity, functional impairment, or FA. Given the high rate of comorbidity between OCD + ADHD, clinicians and researchers should be aware of the need to modify treatment approaches for children with comorbid OCD + ADHD and/or weaker EF performance.

Keywords Accommodation · Executive functioning · Obsessive compulsive disorder · Attention deficit hyperactivity disorder · Family

Obsessive compulsive disorder (OCD) affects between 2 and 3% of children and adolescents [18] and, in the United States alone, roughly 500,000 youth live with OCD [38]. Childhood OCD impairs overall quality of life [58], particularly in familial [57], social [59] and academic settings [51, 65]. For individuals with OCD, obsessions—unwanted, intrusive thoughts, images, or impulses that cause distress—are subsequently reduced by compulsions, which are behaviors designed to assuage the distress of the obsessions, according to set rules or a sense of completion [4]. Common obsessions surround core fears of harm avoidance [64], disgust [47], and/or a sense of incompleteness [64]. Bloch and colleagues' [9] meta-analysis identified four cross-culturally stable symptom dimensions [40]: symmetry (counting and ordering compulsions), forbidden thoughts (checking compulsions), contamination (cleaning compulsions), and hoarding (hoarding compulsions).

OCD is treatable and a robust body of research has demonstrated the effectiveness of Cognitive-Behavioral Therapy (CBT), specifically Exposure with Response Prevention (E/RP), in the meaningful reduction of OCD symptoms, either alone or in tandem with serotonin reuptake inhibitor medication [22]; [46]. Nevertheless, some OCD cases remain difficult to treat [32, 39, 61, 63] and many youth do not achieve remission following treatment [16]. Although many factors are implicated in the suboptimal treatment response of some youth, high rates of other psychiatric comorbidities are common in youth with OCD, with research demonstrating poorer treatment response in these individuals [61]. Nearly 80% of youth with OCD meet criteria for at least

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one other psychiatric disorder, and over half meet criteria for two or more comorbid conditions [17]. Pediatric OCD commonly co-occurs with anxiety and mood disorders and attention deficit/hyperactivity disorder (ADHD; e.g. Storch et al., [61]. ADHD is a neurodevelopmental disorder characterized by excessive inattention and/or hyperactivity [4], affecting roughly 10% of youth between 4 and 17 years. It is marked by dysfunction and dysregulation in a myriad of settings, including deficits in social, familial, and school arenas [30]. Further, ADHD is comorbid in up to 30% of OCD cases [22, 23, 39, 61], with some lines of contrary research suggesting a dual misdiagnosis of OCD + ADHD [1, 3].

While ADHD and OCD alone cause considerable interference in functioning, children with these comorbid conditions have greater impairment than their counterparts with OCD only [16, 39, 63] and demonstrate poorer treatment response [61]. Specifically, children and adults with comorbid OCD and externalizing disorders—including ADHD—have earlier OCD onset [39, 43], greater OCD symptom severity [34], exacerbated school and social impairment (Geller et al., 2003; Langley et al., [34, 63], increased hoarding symptoms [43], and elevated levels of anxiety and depressive symptoms [24, 43]. Youth with comorbid OCD + ADHD have poorer treatment response and remission rates at post-treatment [16, 61] and 6-month follow-up [17] compared to youth with OCD only.

Research suggests several factors may contribute to youth with comorbid OCD + ADHD having poorer treatment outcomes, including deficits in executive functioning (EF). While OCD + ADHD are neurologically different and involve different patterns of brain activity, they share similar cognitive effects in EF [1, 2]. EF is broadly defined as the ability to focus attention, plan and switch tasks, inhibit impulses, and utilize cognitive flexibility [15]. EF deficits are common in a variety of psychiatric disorders, including both ADHD and OCD [31, 48]. Moreover, recent research suggests even greater EF deficits in children with comorbid OCD + ADHD [16, 55]. For example, Farrell and colleagues [16] found that youth with comorbid OCD + ADHD had significantly higher EF deficits than youth with OCD. Further, EF deficits in youth with comorbid OCD + ADHD were associated with greater overall impairment and poorer treatment response compared to youth with OCD only. Given that the gold-standard treatment for OCD is E/RP, which relies on the ability to focus on feared stimuli, EF deficits may decrease exposure effectiveness [29, 31]. Specifically, youth with both OCD + ADHD may particularly struggle with set-shifting, attention, and cognitive flexibility, all of which are necessary to engage with exposure-based treatment [67]. Further, research has documented EF difficulties in children at both outpatient (Farell et al., 2020) and residential levels of care [44], although few studies to date have investigated EF and treatment response in a partial hospital program (PHP) for youth with OCD + ADHD.

Another factor that may be implicated in poorer treatment response in youth with comorbid OCD + ADHD is family accommodation (FA) of symptoms. FA refers to modifications to a caregiver's behavior or statements that are designed to decrease or eliminate a child's distress when exposed to feared stimuli (e.g., O'Connor et al., [45]). Common FA examples include a parent aiding in ritual completion, providing reassurance, or facilitating avoidance of feared situations. A robust body of literature demonstrates high rates of FA in pediatric OCD, with 60 to 96% of caregivers accommodating their children's OCD symptoms (e.g. Rosa-Alcázar et al., [50, 52, 58]. Higher FA relates to increased familial dysfunction [50], symptom severity [19] and poorer CBT response (e.g. Garcia et al., [22, 35, O'Connor et al.,2023 [45]). Although accommodation is well-intended, it results in family members inadvertently reinforcing the child's symptoms by temporarily decreasing their distress. In doing so, family members prevent the child from engaging in the learning process of habituating to the anxiety caused by OCD triggers. This contradicts the E/RP approach, which involves approaching feared situations to promote habituation and increase distress tolerance [8].

Although limited, prior research suggests higher levels of FA in youth with OCD and externalizing symptoms [16, 62], and we would expect to see higher levels of FA in youth at a PHP level of care given their presenting acuity. Storch and colleagues [62] found a positive relationship between FA and symptom severity in children with internalizing and externalizing symptoms. Farrell and colleagues [16] also demonstrated that comorbid OCD + ADHD is associated with higher FA. Similarly, comorbid OCD and disruptive or coercive-disruptive behaviors are associated with high FA [36, 60]. These disruptive behaviors share clinical characteristics with ADHD symptomatology and research suggests that higher FA is associated with the avoidance of potential negative interactions if the family does not accommodate.

Extant literature observing differential treatment responses, rates of FA, and EF in youth with OCD vs. OCD + ADHD is minimal, and previous studies within this domain have primarily occurred at the outpatient level of care. Thus, our study aims to advance understanding about treatment response, FA, and EF in youth with OCD and OCD + ADHD in a PHP. Studying these factors involved in OCD and comorbid OCD + ADHD at the PHP level of care is essential because children typically attend these programs for severe or refractory diagnostic presentations. Therefore, understanding processes involved in OCD and OCD + ADHD is paramount when identifying how to best support and modify treatment for youth in a PHP. As such, we hypothesized that (1) youth with OCD + ADHD would

demonstrate weaker EF performance compared to youth with OCD only; (2) treatment response would be significantly poorer for youth with OCD + ADHD in comparison to youth with OCD only, and (3) FA would be significantly greater in families of youth with OCD + ADHD compared to OCD only. Additionally, (4) exploratory analyses were used to investigate possible associations between various facets of EF (i.e., behavioral regulation, metacognition) in relation to treatment response and FA in youth with OCD + ADHD when compared to youth with OCD.

Method

Participants

The current sample included 240 youth between 5 and 18 years old (M_{Age} = 12.2 years, SD_{Age} = 3.2) who were admitted to a 20 to 30-hour week PHP specializing in E/RP for OCD and anxiety-related disorders between August 2015 and March 2020. Youth were included if they and their parents consented to participate in research and received a primary diagnosis of OCD with or without comorbid ADHD. Diagnoses listed in the medical record at the time of discharge from the PHP were used to determine diagnoses for the present study to encompass both youth who were admitted to the PHP with a pre-existing ADHD diagnosis, as well as youth who received the diagnosis during the admission based on unstructured clinical interviews and collateral information gathered from parents, schools, and/or previous providers. Exclusionary criteria included the presence of an intellectual disability or psychosis, although no patients in the PHP had diagnoses within these categories. Refer to Table 1 for descriptive statistics on participants.

Measures

The *Children's Yale-Brown Obsessive Compulsive Scale* (CYBOCS; Scahill et al., [54] is a clinician-rated, semi-structured interview designed to rate the severity of obsessive and compulsive symptoms in children and adolescents ages 6 to 17 years old. Total scores range from 0 to 40, with higher scores marking greater symptom severity. Scores greater than 16 indicate an OCD diagnosis. The CYBOCS has demonstrated high internal consistency (r =.87), good to excellent interrater reliability (r =.66 to 0.91), and high convergent validity with other measures assessing childhood obsessive compulsive symptoms (r =.62 for the Leyton survey) [54]. In the present study, the CYBOCS Total Score was used to assess OCD symptom severity and treatment response. Based on previous research, treatment response was classified as 30% reduction in CYBOCS symptoms from baseline to post-treatment [17, 60].

The *Clinical Global Impressions Scale* (CGI; Guy [28], is a 2-item clinician report measure for symptom severity (CGI-S) and improvement (CGI-I). Both severity and improvement ratings are ranked on a 7-point scale, with higher scores marking greater functional severity and lower

Table 1 Descriptive statistics by group

Variable	M (SD) or %		
	OCD Only	OCD + ADHD	Group Comparison
Age	12.5 (3.0)	11.9 (3.4)	$t(238) = 1.24, p = .22$
Gender	Female (58.0%)	Female (40.2%)	χ^2 (1, N = 240) = 7.41, p = .01
	Male (42.0%)	Male (59.8%)	
Race	White (88.0%)	White (93.5%)	χ^2 (6, N = 219) = 3.80, p = .71
	Black (1.6%)	Black (2.1%)	
	Asian (0.8%)	Asian (1.1%)	
	Other (4.8%)	Other 1.1%)	
	More than one race (2.4%)	More than one race (1.1%)	
	Declined (2.4%)	Declined (1.1%)	
Ethnicity	Latinx (5.5%)	Latinx (7.7%)	χ^2 (2, N = 200) = 0.46, p = .80
	Not Latinx (91.7%)	Not Latinx (89.0%)	
	Declined (2.8%)	Declined (3.3%)	
Comorbidity	Anxiety disorder (30.4%)	Anxiety disorder (32.4%)	χ^2 (1, N = 240) = 0.10, p = .75
	Mood disorder (39.1%)	Mood disorder (31.4%)	χ^2 (1, N = 240) = 1.54, p = .22
	Autism spectrum disorder (11.6%)	Autism spectrum disorder (18.6%)	χ^2 (1, N = 240) = 2.33, p = .13
	Tic disorder (7.2%)	Tic disorder (15.7%)	χ^2 (1, N = 240) = 4.33, p = .04
Medication during admission	Benzodiazepine (17.4%)	Benzodiazepine (14.7%)	χ^2 (1, N = 240) = 0.31, p = .58
	Stimulant (13.0%)	Stimulant (78.4%)	χ^2(1, N = 240) = 103.79, p < .001
	Antipsychotic (27.7%)	Antipsychotic (30.4%)	χ^2 (1, N = 239) = 0.201, p = .65
	SRI (83.3%)	SRI (81.4%)	χ^2 (1, N = 240) = 0.04, p = .84
Length of Stay	39.7 (22.5)	35.2 (17.7)	$t(238) = 1.67, p = .10$

improvement. CGI-S scores correlate with CYBOCS total scores (r=.75; Storch et al., 2004); CGI-S and CGI-I have good psychometric properties and are commonly used in treatment studies for youth with OCD [20]. In the present study, CGI-S was used to assess functional impairment.

The *Behavior Rating Inventory of Executive Function – Parent Version* (BRIEF – Parent Version; Gioia et al., [26] is an 86-item parent report measure that assesses different aspects of EF in children and adolescents between 5 and 18 years old. The measure yields eight clinical scales which form two broader indices (Behavioral Recognition and Metacognition) in addition to an overall score (Global Executive Composite). Raw scores on each individual clinical scale are converted to t-scores. Standard scores have a mean of 50 and standard deviation of 10, with higher t-scores indicating poorer EF. The BRIEF – Parent Version has demonstrated high internal consistency (α = 0.8–0.98), good test-retest reliability (rs = 0.82), and divergent and convergent validity [26]. In the present study, the Global Executive Composite (GEC) score was used to assess overall executive functioning.

The *Pediatric Accommodation Scale – Parent Report* (PAS-PR; Benito et al., [6] is a 5-item parent report measure of family accommodation for youth with a primary anxiety disorder. The PAS-PR asks parents to rate how often they engaged in various accommodating behaviors over the past week, and the amount of interference the accommodation caused. Responses are rated on a 0 to 4 scale with higher scores reflecting higher rates of accommodation and interference; total scores range from 0 to 40. The PAS-PR has demonstrated good internal consistency (PAS-PR-F α = 0.84), convergent validity, and discriminant validity. In the present study, the PAS-PR was used to assess family accommodation of symptoms.

Procedures

The present study was a secondary data analysis from an existing database. CYBOCS [54], CGI-S [28] and PAS-PR [6] data were collected at both admission and discharge from the PHP, and BRIEF – Parent Version [26] data were collected at admission only (see Table 2). All procedures were approved by the Institutional Review Board at the hospital where the program is located. To meet criteria for the PHP level of care, youth must experience significant distress and functional impairment and/or have not responded to treatment at a lower level of care. Referrals are typically made by primary care providers, outpatient mental health providers, urgent care services, or self-referrals. The main treatment approach used in the PHP is group-based cognitive behavioral therapy with E/RP, with youth participating in two, hour-long E/RP-focused sessions per day with Bachelor's-level direct care staff ("exposure coaches"), as well as additional 1:1 individual sessions throughout the week either in the hospital, community, or at patients' homes. As part of treatment, youth also meet two to three times per week with a psychologist for individual therapy, as well as one to two times per week with a psychiatrist for medication management (see Garcia et al., [21] for full details of the PHP program). Parents and clinicians completed a battery of measures which took approximately 35–45 min to complete, and children and their families were informed they could withdraw at any time. Given that data collected for this study was part of the routine clinical information gathered for treatment, no compensation was offered, and there was no risk of harm for participants in this study.

Data Analysis

All data management and analyses were conducted in Statistical Package for Social Sciences (SPSS), Version 29. Data were examined for normality and patterns of missingness. Missing data ranged from 0 to 70% (PAS-PR Total Score at discharge), and youth with missing data did not differ from youth without missing data on any demographic or primary variables of interest (ps > 0.05). Given this, listwise deletion was used in cases of missing data. To analyze Aim 1, ANCOVAs were used to investigate EF differences between the OCD and OCD + ADHD groups, and total number of comorbid diagnoses was included as a covariate, as it was significantly associated (p < .05) with the primary dependent variables of interest (BRIEF-Parent Version scores). For Aim 2, chi-square analyses were used to test the hypothesis that treatment response would be significantly poorer for youth with OCD + ADHD in comparison to youth with OCD only. To analyze Aim 3, independent sample t-test analyses were used to explore FA differences between youth with OCD + ADHD vs. OCD only. Finally, bivariate correlation analyses were used to investigate possible associations between various facets of EF in relation to treatment response and FA in youth with OCD + ADHD vs. OCD only (Aim 4).

Results

Preliminary Results

Basic assumptions of the general linear model were assessed to confirm that data met assumptions of normality, linearity, homoscedasticity, and homogeneity of regressions. Skewness and kurtosis values were within normal limits for all variables of interest (West, Finch, & Curran [66]). Data were also examined for outliers by examining the distribution

Table 2 Descriptive information for measures

Scale	Construct	Time Point	*N*	Range	M(SD)
CGI-S	Functional Impairment	Admission			
OCD			88	3–7	4.92 (0.79)
OCD + ADHD			68	3–7	4.85 (1.01)
CGI-S	Functional Impairment	Discharge			
OCD			79	2–7	4.08 (0.93)
OCD + ADHD			65	3–7	4.09 (0.90)
CGI-I	Symptom Improvement	Discharge			
OCD			77	1–5	2.25 (0.85)
OCD + ADHD			65	1–5	2.34 (0.78)
PAS-PR Total Score	Familial Accommodation	Admission			
>OCD			45	1–40	22.16 (10.46)
OCD + ADHD			44	2–38	22.30 (9.23)
PAS-PR Total Score	Familial Accommodation	Discharge			
OCD			36	0–26	9.83 (6.89)
OCD + ADHD			33	0–23	9.85 (5.86)
CYBOCS Total Score	Symptom Severity	Admission			
OCD			93	18–40	29.09 (4.72)
OCD + ADHD			67	10–40	27.99 (5.07)
CYBOCS Total Score	Symptom Severity	Discharge			
OCD			85	1–36	18.21 (6.35)
OCD + ADHD			64	0–30	18.17 (5.37)
BRIEF Behavioral Regulation Index	Behavioral Regulation	Admission			
OCD			69	27–62	45.59 (8.86)
OCD + ADHD			55	33–71	54.87 (9.16)
BRIEF Metacognitive Index	Metacognitive Abilities	Admission			
OCD			57	27–66	45.76 (9.52)
OCD + ADHD			50	38–71	55.17 (7.12)
BRIEF Global Executive Composite	Overall Executive Functioning	Admission			
OCD			56	25–67	45.29 (8.87)
OCD + ADHD			47	39–73	55.84 (7.24)

Note CGI-S = Clinical Global Impressions - Severity of Illness; CGI-I = Clinical Global Impressions - Global Improvement; PAS-PR = Pediatric Accommodation Scale - Parent Report; CYBOCS = Children's Yale-Brown Obsessive Compulsive Scale; BRIEF-PR = Behavior Rating Inventory of Executive Functioning - Parent Version

of each variable, and data points with z-scores above 3.0 or below −3.0 were removed. Based on an observation of z-scores, three outliers were detected for the variable measuring overall symptom severity at discharge (CGI-S), one outlier was detected for the variable measuring OCD symptom severity at admission (CYBOCS Total Score), and one outlier was detected for the variable measuring OCD symptom severity at discharge (CYBOCS Total Score; Cousineau & Chartier [12]. Primary analyses were conducted both with and without the outliers, and results did not differ significantly; therefore, all analyses are based on the original dataset.

Independent sample t-tests and chi-square analyses were conducted to examine associations between diagnostic group (i.e., OCD v. OCD + ADHD) and key demographic variables. No associations were observed between diagnostic group and age ($t(238) = 1.24$, $p = .22$), race ($x^2(6, N = 219) = 3.80$, $p = .71$), ethnicity ($x^2(2, N = 200) = 0.46$, $p = .80$), or length of stay ($t(238) = 1.67$, $p = .10$); however, analyses revealed a significant association between diagnostic group and gender, such that males were significantly more likely to be diagnosed with OCD + ADHD in comparison to females ($x^2(1, N = 240) = 7.41$, $p = .01$). However, gender was not significantly associated with any of the primary outcome variables, and therefore was not included as a covariate in any of the primary analyses. Diagnostic groups also differed in the total number of comorbid diagnoses, with participants in the OCD + ADHD group having significantly more comorbid diagnoses than youth with OCD only ($t(188.30) = 6.63$, $p < .001$). Youth with OCD + ADHD were also significantly more likely to have comorbid tic disorders ($\chi^2(1, N = 240) = 4.33, p = .04$) and to be prescribed stimulant medications ($\chi^2(1, N = 240) = 103.79$, $p < .001$) in comparison to youth with OCD only. However, tic disorder comorbidity and stimulant usage were not significantly correlated with change in symptom severity, functional impairment,

Table 3 Executive functioning differences at admission between OCD v. OCD + ADHD when controlling for number of comorbid diagnoses

BRIEF-PR Scale	OCD Only		OCD + ADHD		F	η_p^2
	M	SD	M	SD		
Behavioral Regulation Index	45.59	8.86	54.87	9.16	$F(1,121) = 22.84$***	0.16
Metacognitive Index	45.76	9.52	55.17	7.12	$F(1,104) = 24.17$***	0.19
Global Executive Composite	45.29	8.87	55.84	7.24	$F(1,100) = 31.22$***	0.24

Note BRIEF-PR = Behavior Rating Inventory of Executive Functioning - Parent Version

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

Table 4 Treatment response for OCD v. OCD + ADHD group

	Treatment Responder	
	Yes	*No*
OCD	$n = 54$ (70.1%)	$n = 23$ (29.9%)
OCD + ADHD	$n = 30$ (51.7%)	$n = 28$ (48.3%)

or familial accommodation so were not included in further analyses.

Primary Results

One-way ANCOVAs were used to investigate differences in EF between the OCD and OCD + ADHD groups when controlling for the number of comorbid diagnoses (Aim 1). Three separate ANCOVAs were conducted to investigate differences in EF at admission across the three main indices as assessed by the BRIEF – Parent Version (see Table 3). When controlling for the number of total comorbid diagnoses, results revealed that the youth in the OCD + ADHD group were rated as having significantly poorer EF when compared to youth with OCD only. Youth with OCD + ADHD were rated as having significantly poorer EF on the behavioral regulation index ($F(1,121) = 22.84$, $p < .001$, $\eta_p^2 = 0.16$), metacognitive index ($F(1,104) = 24.17$, $p < .001$, $\eta_p^2 = 0.19$), and global executive composite ($F(1,100) = 31.22$, $p < .001$, $\eta_p^2 = 0.24$) when compared to youth with OCD only.

For treatment response (Aim 2), findings indicated that youth with OCD + ADHD were significantly less likely to respond to treatment vs. youth with OCD only (χ^2 (1, $N = 135$) = 4.77, $p = .03$). See Table 4. For FA (Aim 3), no significant differences emerged between the OCD and OCD + ADHD groups at admission ($t(87) = -0.07$, $p = .95$) or at discharge ($t(67) = -0.01$, $p = .99$).

Contrary to our initial hypotheses in Aims 3 and 4, bivariate correlations revealed no relationship between EF and baseline symptom severity, as assessed by the CYBOCS ($r(65) = 0.05$, $p = .69$); baseline functional impairment, as assessed by the CGI-S ($r(73) = 0.004$, $p = .97$); or baseline FA ($r(68) = 0.15$, $p = .24$). Baseline symptom severity was also not associated with baseline FA ($r(57) = -0.01$, $p = .99$), nor was baseline FA associated with change in symptom severity, as assessed by change in CYBOCS score ($r(44) = -0.05$, $p = .74$). Change in symptom severity was significantly associated with change in functional impairment ($r(98) = -0.27$, $p = .008$), but was not associated with change in FA ($r(27) = -0.12$, $p = .54$). Bivariate correlations also revealed no relationship between EF and change in symptom severity ($r(51) = -0.09$, $p = .51$), or between EF and change in FA from admission to discharge ($r(39) = 0.19$, $p = .24$). Given this, no additional exploratory analyses were conducted.

Discussion

The present study offers preliminary evidence of meaningful differences between groups that have implications for modifying treatment approaches for youth with OCD and comorbid ADHD. Consistent with current study hypotheses (Aims 1 and 2) and previous research [16], poorer EF and an attenuated treatment response were observed in youth with primary OCD + ADHD compared to youth with OCD only. Previous research has widely reported EF deficits in ADHD (e.g. Savci et al., [53]) and OCD (e.g. Snyder et al., [56], which coincides with this study's observation of poorer EF in youth with comorbid OCD + ADHD. EF deficits are linked to inattention, and CBT with E/RP—the gold standard treatment for OCD—requires the capacity to sustain attention and focus on E/RP tasks to experience new learning about feared stimuli (e.g., habituation of distress, fear tolerance; Craske et al., [13, 14]. Previous literature has noted that distractibility and inattention decreases exposure effectiveness, meaning untreated EF deficits may impair the efficacy of exposure-based treatment [29, 31]. As such, our findings of weaker EF performance in children with comorbid OCD + ADHD support previous research documenting attenuated treatment responses in youth with comorbid OCD + ADHD [16, 17, 61].

Given attentional control's role in EF, we hypothesized that poorer EF would relate to poorer treatment response (Aim 4). However, contrary to study predictions, EF did not predict treatment response. There are several possible reasons for this finding. First, it is possible that the EF measure, the BRIEF- Parent Version [26] — which was only given at admission – may not have fully captured EF performance. The BRIEF- Parent Version is an indirect

measure of children's EF that relies on parental behavioral observations of their children that are typically limited to the home setting. As such, we did not gather information about ADHD impairment and symptomatology in other settings, from other sources, or using other measures. These additional data points would have been useful in creating a more complete symptomatic picture, in addition to validating and reinforcing parental reports. It is possible that a more direct measure that factors children's home, school, and extracurricular behaviors—aggregated with reports from teachers, extracurricular providers, other sets of caregivers, and the child themselves—could demonstrate EF as a treatment response predictor. Additionally, we did not parse out ADHD by severity or subtype. Research has demonstrated EF differences by subtype such that children with combined-type ADHD display more deficits in verbal working memory and category shifting than children with inattentive-type ADHD [5]. It is possible that the severity level and specific EF performance of our ADHD sample may not relate to treatment response.

Contrary to study hypotheses (Aim 3) and previous research (e.g., Farrell et al., [16], no differences were found in FA between participants with OCD + ADHD versus those with OCD only. In Farrell and colleagues' [16] outpatient level of care study, parents of children with comorbid OCD + ADHD reported significantly higher levels of FA than parents of children with OCD only. Other studies at the outpatient level of care reported increased FA in families of children with comorbid OCD and disruptive or coercive-disruptive behaviors [36, 60]. At higher levels of care (intensive outpatient, partial hospitalization and residential), a recent study on FA in youth with OCD and anxiety found elevated FA levels [33], indicating baseline scores greater than twice that of outpatient samples on the Family Accommodation Scale – Anxiety (FASA; Lebowitz et al., [37]. Additionally, La Buissonnière-Ariza and colleagues [33] found that anxiety severity was not a significant predictor of FA when accounting for other factors, such as age and depression severity. The present study did not factor other comorbidities besides ADHD (such as depression), and severity of other symptoms, which may explain the similar FA scores in participants with OCD vs. OCD + ADHD. Further, while other studies utilized the parent-report Family Accommodation Scale (FAS; Calvocoressi et al., [10] and FASA [37] scales to measure FA, the current study used the PAS-PR [6]. The PAS-PR has 5-items, which is less than half the amount of items on the FAS [10] and FASA [37]. While the PAS-PR has good psychometric properties [6], it could be that the present study's fewer item measure could not detect FA as sensitively as scales with more items are typically more reliable. Additionally, because the present study did not analyze ADHD subtype, it may be that youth in the OCD + ADHD group exhibit more inattentive symptoms of ADHD that may interfere with E/RP but are less likely to elevate FA. Our study also did not analyze medication management of ADHD due to inconsistencies across if and when patients started medication, so it is possible that many in the comorbid OCD + ADHD group had symptoms that were so well managed with medication that there were no notable FA differences between the OCD vs. OCD + ADHD groups.

Another consideration for the lack of detected differences in FA between children with OCD vs. OCD + ADHD is that the accommodation measure utilized by the present study–the PAS-PR [6]–was designed to measure anxiety accommodation, which differs from ADHD accommodation. For example, common anxiety FA involves families removing the anxiety-provoking stimulus or aiding in ritual completion (e.g. O'Connor et al., [45]), where a parent may touch door handles for their child. Conversely, FA in ADHD involves parental scaffolding, wherein a parent provides temporary supports to assist the child in gradually mastering activities independently [7], due to difficulties with EF and attention [42]. With this accommodation, a parent may guide their middle-school aged child through the process of getting ready for school step-by-step to keep them on task. Given that FA differs transdiagnostically, perhaps children with comorbid OCD + ADHD experience greater FA than children with OCD only, but the current study's FA measure did not capture this accommodation.

Given that the present study's findings offer preliminary evidence of meaningful differences between youth with OCD and comorbid OCD + ADHD, we therefore recommend some potential treatment modifications for youth in the latter group. The study observed weaker EF performance in youth with comorbid OCD + ADHD, which could pose difficulty during E/RP. As such, it may be helpful for clinicians to incorporate strategies designed to increase attention and engagement. For example, a clinician may need to repeat instructions clearly and frequently, build in structured breaks, scaffold, and utilize a token economy system to maximize attentional ability. Incorporating play into E/RP also serves potential benefits for youth struggling with sustained attention. For instance, in structuring exposure work for a child with comorbid OCD + ADHD whose concerns revolve around illness, a clinician may turn an exposure task into a matching game with illness-themed cards to increase engagement.

Limitations and Future Directions

Although the present study offers a meaningful contribution to existing literature, there are several limitations that warrant acknowledgement. First, generalizability of these

findings is limited by the homogeneous nature of the sample. Most youth included in this study identified as White and non-Latinx, with racial and ethnic minority populations underrepresented. Given that previous research indicates that CBT treatment response for anxiety and OCD varies among racial background, with some studies indicating that racial minority youth exhibit poorer CBT treatment response compared to White youth [21, 25], future research should recruit more inclusive samples. Second, the present study's small sample size and unequal groups likely restricted power, limiting the ability to detect small effects [41] between groups. We recommend that future studies employ larger group sizes to adequately detect differences between groups. Third, because these data were collected from a PHP rather than within the context of a controlled research study, there was a significant amount of missing data. With these missing data, the current study used listwise deletion, and future studies may benefit from imputing missing data to create a more robust dataset. Additionally, youth who consent to research as part of a PHP may not be representative of the program population as a whole. Given that families undergo an additional consent process and fill out additional forms as part of research participation in this particular PHP setting, perhaps these families are not representative of the broader PHP population.

Another study limitation is the utilization of parental reports (the BRIEF- Parent Version; Gioia et al., [26] to assess youth EF, which may not fully capture children's EF across all functional domains. Future studies could benefit from directly measuring children's EF with assessments such as the ROCF [49], Wisconsin Card Sorting Test [27], or Conners Continuous Performance Test [11], and aggregating those results with the BRIEF-Parent version. Additionally, the present study only assessed BRIEF scores at admission and did not measure discharge data. As such, the study was unable to measure if children with comorbid OCD + ADHD were able to improve their EF during the administered course of E/RP in the PHP. Future research may benefit from assessing EF at both admission and discharge. Some existing research suggests a dual misdiagnosis of OCD + ADHD, where symptoms of inattention possibly resulting from OCD lead to a misdiagnosis of ADHD [1, 3]. This is explained by the Executive Overload model wherein people with OCD experience an overflow of obsessive thoughts, resulting in an overload on the executive system which mirrors executive dysfunction symptoms of ADHD [1]. Another line of research highlights greater comorbidity rates of OCD + ADHD in childhood, but not adulthood. Research suggests greater comorbidity rates in childhood due to OCD symptoms fitting the symptomatic presentation of ADHD that then dissipates over time as the brain develops [2]. Given that the present study did not have information about when an ADHD diagnosis occurred, it is possible that youth with comorbid diagnoses were misdiagnosed with ADHD. Future research may benefit from longitudinally following children with comorbid diagnoses of OCD + ADHD across the lifespan to further elucidate the developmental process of these disorders.

Future research should investigate correlates contributing to differential treatment response in youth with OCD and comorbid ADHD. Given OCD's heterogeneous presentation and expression, we suggest investigating whether there are more nuanced differences in EF and treatment response based on OCD subtypes (e.g., core fears of harm avoidance, disgust, and incompleteness) and clinical expression. Our study examined the number of comorbid diagnoses on treatment response, and we recommend that future research analyze not only the number of comorbid diagnoses, but also the type of comorbid diagnoses. Additionally, future research may benefit from exploring other correlates that may influence both FA and treatment response, including prior treatment experiences (e.g., outpatient CBT with E/RP, prior PHP admissions, residential care, medication trials), which may further elucidate factors that contribute to differential outcomes across youth.

Summary

The current study advances understanding of differential treatment responses, FA, and EF between children with OCD and comorbid OCD + ADHD. This study expands on previous literature by examining these constructs in a partial hospitalization program. Findings suggest poorer treatment response and EF in children with comorbid OCD + ADHD compared to their counterparts with OCD only. No significant differences emerged between groups in baseline levels of symptom severity, functional impairment, or familial accommodation. Given the high rate of comorbidity between OCD + ADHD, these findings have meaningful implications for modifying treatment approaches for children with OCD and comorbid ADHD and/or weaker EF performance. Treatment targeted toward children with comorbid OCD + ADHD might include more structured breaks and scaffolding of exposures to increase E/RP effectiveness.

Author Contributions M.M. and B.K. wrote the main manuscript text. B.K. came up with study design and prepared all tables. E.O. and J.F. assisted with study design. All authors reviewed the manuscript.

Data Availability No datasets were generated or analysed during the current study.

Declarations

Competing Interests The authors declare no competing interests.

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