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Research paper

The psychosocial and educational burden of obsessive-compulsive disorder in youth

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ABSTRACT

Background: Pediatric OCD is associated with functional impairment in multiple environments. However, relatively little is known about the impact of comorbid conditions, as well as OCD severity on psychosocial functioning in this population. Furthermore, most studies did not include a control sample, nor examined differences between children and adolescents. The goal of this investigation was to assess psychosocial functioning and its associations with age, symptom severity, and comorbid conditions in a large well characterized sample of pediatric OCD probands, and controls.

Methods: Participants included 117 pediatric OCD probands and 147 controls, that underwent a careful diagnostic process, and completed several questionnaires and interviews.

Results: Results revealed significant psychosocial impairments across multiple domains/settings, some of which were affected by symptom severity as well as by conduct related comorbidities and to a lesser extent affective disorders. In addition, different aspects of psychosocial impairments were found between children and adolescents.

Conclusion: This study provides high resolution information regarding the types and extent of psychosocial dysfunction in youth with OCD, as well as its relationship with clinical and diagnostic correlates. It is recommended that evaluation and management of OCD in youth in research and clinical settings regularly include qualitative and semi-quantitative assessment of function across these domains.

1. Introduction

Obsessive-compulsive disorder (OCD) is a common and potentially debilitating condition affecting approximately 1–2 % of adults and 1–3 % of children and adolescents (Fawcett et al., 2020; Flament et al., 1988; Rapoport et al., 2000). While obsessive thoughts and compulsive rituals are the hallmark symptoms of OCD, the disorder is also frequently accompanied by functional deficits across a wide range of domains, which is integral to the diagnosis (American Psychiatric Association, 2013). Indeed, functional impairments have been consistently documented among adults with OCD, demonstrating that many struggle to work efficiently, complete household duties, and manage relationships and broader social responsibilities (e.g., Eisen et al., 2006; Jacoby et al., 2014; Lochner et al., 2003; Vikas et al., 2011; Wetterneck et al., 2020). However, most cases of OCD begin during childhood or adolescence (Dell'Osso et al., 2016), necessitating the study of the impact of functional impairment in this age group.

Compared to the adult OCD literature there is relatively limited research examining psychosocial functioning in youth with OCD. Extant research indicates impairments across several domains, including academic performance, family and peer relationships, and activities of daily living (Piacentini et al., 2003; Stewart et al., 2017; Weidle et al., 2014). In the largest study to date ($n = 151$), Piacentini et al. (2003) found that nearly 90 % of children with OCD report impairment in at least one domain and almost 50 % endorse impairment in at least three domains. Further, studies show that functional impairments in youth with OCD are positively associated with symptoms-severity across several symptomatic domains in both adults and youth with OCD (Storch et al., 2009a; Storch et al., 2010a). Finally, one follow-up study (Thomsen, 1995) suggested that functional impairments in youth with OCD may persist into adulthood, albeit in different forms.

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1.1. Academic functioning

School presents an environment for socialization and intellectual development of youth; yet obsessive-compulsive symptoms can interfere with school functioning in a variety of ways. For instance, engaging in rituals in school may result in repeated class disruptions, social alienation or recurring tardiness, while obsessive thoughts may diminish focus on assignments or lead to procrastination and avoidance (Fischer-Terworth, 2013; Piacentini et al., 2003). Indeed, one of the most common child- and parent-reported OCD-related impairments are related to school work and homework, with endorsement ranging from 32 % to 47 % (Piacentini et al., 2003). This is consistent with findings from more recent studies in which children with OCD reported being most affected by their symptoms in the school domain (du Plessis et al., 2022). Similar work suggests that parents may under-recognize the effects of OCD on their child's academic performance (Stewart et al., 2017). Interestingly, in a large neuropsychological study of youth with OCD, Geller et al. (2018) found that underperformance on cognitive tests did not meet the definition of cognitive impairments, leading the authors to suggest that these relative weaknesses may be overlooked by school systems (Geller et al., 2018). This may also imply that impairments in school settings may be more related to the child's state, as they are driven more by OCD symptoms and to a lesser extent by cognitive deficiencies on the trait level. Taken together, these factors may contribute to the worse long-term educational attainment documented in people with OCD (Pérez-Vigil et al., 2018).

Despite the relative neurocognitive weaknesses and various case-specific functional impairments experienced by children in the school environment, less than a handful of studies have examined whether this amounts to elevated special education requirements or repeated grades in children with OCD (Geller et al., 2000; Joshi et al., 2010). One study examining children with OCD seen at specialized and nonspecialized clinics found that 19 % of those assessed repeated a grade, while 35 % were placed in a special class and 46 % received extra help in school. Another study of children with ADHD with and without comorbid OCD found that the presence of OCD did not increase rates of special classes, repeated grades, and tutoring (Geller et al., 2000). Therefore, when examining everyday function in pediatric OCD, there is a need to assess the role of comorbid conditions, especially with regards to disorders that are associated with academic and behavioral difficulties.

1.2. Social and daily living function

Children with OCD have also been found to suffer from impairments in social adjustment and activities of daily living. These include impairments in communication and socialization skills (Sukhodolsky et al., 2005), as well as with household chores and bathing/grooming (Piacentini et al., 2003). In the interpersonal domain, youth with OCD may struggle to make and keep friends or participate in after school activities (Piacentini et al., 2003). Indeed, some reports indicate that up to three-quarters of youth with OCD suffer to some extent from interpersonal problems with friends (du Plessis et al., 2022; Piacentini et al., 2003; Valderhaug and Ivarsson, 2005).

1.3. Family functioning

Finally, the impacts of pediatric OCD extend beyond the affected child to the entire family unit. A majority (66 %–70 %) of parents of children with OCD report problems at home (Piacentini et al., 2003; Valderhaug and Ivarsson, 2005). Specifically, some studies identified frequent disruption of family routines, primarily morning and bedtime tasks and mealtimes, in families of children with OCD (Stewart et al., 2017). Other studies suggest that difficulties in functioning experienced by families of children with OCD may be attributable to comorbid conditions. For example, one study comparing children with OCD to children with OCD with comorbid ADHD found that although OCD alone was associated with psychosocial impairments, the presence of comorbid ADHD was associated with increased family dysfunction (Sukhodolsky et al., 2005). Research examining the role of other comorbidities suggests that the family environments of OCD patients may be characterized by low levels of cohesion and high levels of conflict, especially in the presence of comorbid affective disorders (Canavera et al., 2010; Langley et al., 2010), though more work is needed to elucidate the impact of different types of comorbidity categories related to family function among youth with OCD.

This body of research has some limitations including small sample sizes and lack of control samples. In addition, although most youth with OCD suffer from comorbid conditions, the impact of such conditions on psychosocial functioning is relatively under-studied. Likewise, although the presence of academic impairment in youth with OCD has been documented, it is unclear how often these difficulties lead to school interventions (e.g., special classes, extra help), or repeated grades, and their association with OCD symptoms severity remains underesearched.

Therefore, the aim of the present study is to fill in these gaps in research and to extend previous findings by examining rates of psychosocial and educational impairment in a large, well-characterized sample of youths with and without OCD, and by investigating the extent to which comorbidities and symptom-severity are associated with functional impairment in these domains. Considering the available research, we hypothesized that youth with OCD would demonstrate increased family conflict and decreased cohesion and greater social dysfunction across school functioning, spare time activities, peer relationships and home behavior. Based on limited previous educational findings and due to the burden of current psychopathology, we hypothesized that children with OCD would require higher rates of educational accommodations than controls. Finally, given that conduct related disorders are associated with significant problems in psychosocial functioning among youths (Eskander, 2020) we hypothesize that comorbid conduct related disorders may be associated with worse psychosocial functioning among youth diagnosed with OCD, and to a lesser extent, comorbid affective and anxiety disorders.

2. Material and method

2.1. Participants

The OCD proband group ($n = 118$) was recruited as part of a large OCD family study (NIMH K08MH01481) conducted at Massachusetts General Hospital. Of the entire proband sample, 15 % were recruited through advertising and direct clinician referral and the remaining were patients referred to the OCD clinic. Inclusion criteria included ages between 6 and 17 years, a primary diagnosis of OCD, and basic English language proficiency. Exclusion criteria were any major sensorimotor disability (e.g., deafness or blindness), an eating disorder, psychosis, autism, or pervasive developmental disorder. The control group ($n = 142$) was comprised of identically designed contemporaneous case–control family studies of youths obtained from pediatric settings. Detailed research methodology can be found elsewhere (Biederman et al., 2002; Rosenbaum et al., 2000). In brief, these studies assessed families based on cases and controls (i.e., ADHD cases, and non-ADHD controls) children aged 6–17 years at time of participation. The same team of highly trained raters conducted all interviews, using the same assessment battery, therefore avoiding a cohort effect. For the present study, a random sample of biological siblings of the non-ADHD control participants was selected that matched the OCD proband sample on age and gender. In addition to excluding participants with a lifetime or current diagnosis of OCD, exclusion criteria were the same as the OCD proband sample. We did not exclude participants with other disorders from the control group in order to compare probands to 'normal' control sample that more closely represents community rates of disorders instead of a 'super-normal control' sample with all disorders screened out that may inflate differences between the sample and hinder

generalizability. Demographic information is presented in Table 1.

2.2. Measures

2.2.1. Diagnostic assessment

To assess and record past and current psychiatric disorders we used the Kiddie Schedule for Affective Disorders and Schizophrenia (Kiddie SADS-E; Orvaschel et al., 1982). The Kiddie SADS-E is a structured diagnostic interview focusing on current psychiatric status of children ages 6 to 17 concentrating only on the presence or absence of symptoms of psychiatric disorders.

2.2.2. Obsessive-compulsive symptom severity

The Children's Yale-Brown Obsessive-Compulsive Scale (CY-BOCS; Scahill et al., 1997) was used to assess severity of obsessive-compulsive symptoms, and was administered by one of the study authors (DG). The CY-BOCS is a semi-structured clinician administered interview consisting of a symptom checklist, and a 10-item severity scale. Each item is rated from 0 (none) to 4 (extreme), and the total score ranges from 0 to 40 with higher scores indicating a greater severity of symptoms. The CY-BOCS is considered a 'gold-standard' measure of OCD symptoms in youth and is characterized by strong psychometric properties (Storch et al., 2004). The CY-BOCS total score demonstrated very good internal consistency in the present study (Cronbach's $\alpha = 0.87$).

2.2.3. Social adjustment

To assess social adjustment, we used the Social Adjustment Inventory for Children and Adolescents (SAICA; John et al., 1987). The SAICA is a semi-structured interview consisting of 77 items that cover four domains of performance: school, spare time activities, peer relations, and home functioning. Each area is evaluated from items that assess competence behaviors and potential behavioral problems within those areas. The SAICA consists of 35 competence items where higher scores indicate reduced competency (scored from 1, "very competent/involved in the activity", to 4, "not at all competent/involved in the activity") and 42 behavioral problem items where higher scores indicate more severe problems (scored from 1, "not at all a problem", to 4, "a severe problem for the child"). Notably, two types of questions related to intimate relationships (i.e., boy-girl relationships, and problems with the opposite sex) were not relevant to younger participatns and thus were not administered to pre-adolescent aged children. The SAICA demonstrated good internal consistency in the present study ($\alpha = 0.73$).

2.2.4. Family environment

To assess multiple aspects of family social environments, we used the Family Environment Scale 3rd Edition (FES; Moos and Moos, 1994). The FES consists of three forms (Real, Ideal, and Expectations) to assess perceptions of current family environment, preferences about an ideal family environment, and expectations about family settings. It consists of 10 subscales: cohesion, expressiveness, conflict, independence, achievement, intellectual-cultural, active-recreational, moral-religious, organization, and control, that measure each of the three forms in three dimensions: relationship dimension, personal growth dimension, and system maintenance dimension. Each subscale scores range from 0 to 9.

We compared the probands and controls on six of the outcomes from the FES: expression past, expression current, conflict past, conflict current, cohesion past, and cohesion present. The expressiveness subscale assesses the extent to which family members are encouraged to act openly and express their feelings directly. The conflict subscale measures the amount of openly expressed anger, aggression and conflict among family members, and the cohesion subscale measures the degree of commitment, help, and support family members provide for one another. In the present study, the FES demonstrated very good internal consistency for the expressiveness, conflict, and cohesion subscales ($\alpha =$ 0.87, 0.88, and 0.82, respectively).

2.2.5. Academic functioning

Academic performance was reported in 3 categories: repeating a grade, special class placement (past and current), and extra help (past and current). Participation in a special class was defined as attending a special classroom for learning disabilities with special education teachers. The extra help variable was defined as receiving special education services that were provided as part of a school based 504 plan or a federal IEP plan that usually involves extra one-on-one support, either within the classroom with an aide or in a special classroom setting. Information was obtained from the participants' parents.

Table 1
Demographic and clinical characteristics.

Measure	OCD ($n = 118$)		Control ($n = 142$)		F (1,258)	X^2	p
	M	SD	M	SD			
Age M (SD)	11.51	3.07	11.49	3.04	0.002		0.97
Sex at birth % female (n)	40.68 % (48)		42.25 % (60)		0.065	0.066	0.80
CY-BOCS Total	21.24	5.34					
CY-BOCS Obsessions	11.11	2.90					
CY-BOCS Compulsions	9.94	2.92					

Note. CY-BOCS, Children's Yale-Brown Obsessive-Compulsive Scale; OCD, obsessive-compulsive disorder.

2.3. Procedure

A parent or legal guardian of all participants signed informed consent, and every participant received monetary compensation as part of the family study. The study was approved by the McLean/Massachusetts General Hospital IRB. Clinical assessments were conducted in a standardized fashion following published guidelines. Using blind independent interviews with patients' mothers as well as direct interviews with patients, the Kiddie SADS-E was used for psychiatric assessments. Trainers were blinded to the clinical status of subjects and were identically trained to evaluate participants of both groups. Each source of information from direct and indirect Kiddie SADS-E was blindly weighed by a diagnostic review team using the Best Estimate method described by Leckman and colleagues (Leckman et al., 1982) yield diagnoses as well as clinical judgements using the information from each report. Diagnoses were definite if DSM-IV criteria (American Psychiatric Association, 2000) were met and considered to be clinically significant. Resolution of discrepancies between parents and children were met by using both parent and children reports and a consensus algorithm that accounted for the more severe rating from either source. Then, a clinical interview was performed by an expert child psychiatrist (DG) on children and adolescents. Additionally, DG administered the CY-BOCS, the Yale Global Tic Severity Scale (Leckman et al., 1989), and in favor of the informant deemed most reliable, resolved any discrepancies between parent and child reports. Age of onset was identified using the age at which symptoms were estimated to be clinically impairing as defined by when overall daily symptom presentation equaled or was greater than one hour as indicated by a score of greater than or equal to two on CY-BOCS severity items 1 and 6. In addition, if subjective distress was more than mild as indicated by a score of two or higher on the CY-BOCS severity items 3 and 8, and if function impairment was at least moderate as indicated by a score of greater than or equal to two on CY-BOCS severity items 2 and 7.

2.4. Statistical analysis

All analyses were run using version 27.0 of the Statistical Package for the Social Sciences (IBM Corp., 2020). For nominal variables we used

Chi-squared analyses for group comparison. Additionally, a series of Analysis of Variance (ANOVA) tests were used for group comparisons for continuous variables. To examine the association between continuous variables, we used a series of zero-order Persons's correlations. Since younger youths were not asked about two SAICA items involving romantic relationships, to examine the association between the CY-BOCS and SAICA outcomes, stepwise regressions were performed separately within the two age groups of adolescents, and children (under the age of 13 and age 13 and above).

3. Results

3.1. Demographics

The groups did not differ significantly on age ($p = .97$) or sex ($p = .80$), and the OCD group's CY-BOCS total score reflected an overall moderate degree of severity (see Table 1).

3.2. Social adjustment

The ANOVA comparing means across SAICA factors revealed mulitple significant differences between OCD probands and controls (see Table 2). As such, children with OCD scored significantly higher on social adjustment impairment scales assessing school behavior problems, spare time activities, spare time problems, activities with peers, problems with parents, as well as on the SAICA total score. Notably, large effect sizes were found for spare time activities, and activities with peers, whereas small-medium effect sizes were found for the other outcomes, and a medium effect for the SAICA total score. No other significant differences were found on the rest of the SAICA factors.

A series of zero-order correlations were computed to examine associations between the SAICA factors and the CY-BOCS total score in the OCD sample. Significant positive correlations between the CY-BOCS total score and spare time activities ($r = 0.23$, $p = .017$), activities with peers ($r = 0.25$, $p = .011$), problems with the opposite sex ($r = 0.33$, $p = .012$), and the SAICA total score ($r = 0.32$, $p = .001$), all reflecting a positive association between OCD severity and social adjustment problems. Examination of the associations between the SAICA outcomes and the CY-BOCS obsessions score revealed similar significant positive correlations with spare time activities ($r = 0.26$, $p = .009$), activities with peers ($r = 0.23$, $p = .020$), problems with the opposite sex ($r = 0.32$, $p = .017$), and the the SAICA total score ($r = 0.35$, $p < .001$). Similar results were found when we computed correlations with the CY-BOCS compulsions severity score. Specifically, significant correlations were found with activities with peers ($r = 0.25$, $p = .011$), problems with the opposite sex ($r = 0.33$, $p = .013$), and the SAICA total score ($r = 0.24$, $p = .012$).

Finally, boy-girl relationships - examined within OCD probands 13 years old and older - resulted in significant positive correlations with the CY-BOCS total score ($r = 0.45$, $p < .001$), CY-BOCS obsession severity scores ($r = 0.43$, $p = .001$), and CY-BOCS compulsion severity scores ($r = 0.45$, $p < .001$), exemplifying positive associations between OCD severity and problems on these domains. No other significant correlations were found (see Table 3) with CY-BOCS scores.

To examine the relative impact of OCD symptom severity on different SAICA domains, an exploratory stepwise regression analyses examining the association between of SAICA factors and the CY-BOCS total score separately for youth younger than, or 13 and older were calculated. Within the younger OCD proband group, only one SAICA factor, 'school behavior problems,' was significantly associated with the CY-BOCS total score ($F(1, 56) = 4.75$, $p = .03$, $R^2 = 0.078$). On the other hand, in youth 13 and older, stepwise regression revealed that four outcome measures were significantly associated with the CY-BOCS total score (boy-girl relationships, problems with the opposite sex, problems with parents, and spare time activities). The final model was found to be significant ($p < .01$), accounting for 55.3 % of the variance (see Table 4). Interestingly, the SAICA factor 'problems with parents' was a negative predictor, meaning that increased OCD severity was related to *reduced* problems with parents among teens.

3.3. Family environment

To examine group differences related to the family environment, a series of ANOVAs comparing FES subscales between the OCD and control groups were conducted. Results revealed significant differences between the two groups on cohesion (current and past), and conflict

Table 2
Comparison between OCD probands and controls on social adjustment indices.

SAICA factors	OCD		Controls		*F*	*p*	*d*
	M	*SD*	*M*	*SD*			
School behavior problems	1.91	0.70	1.62	0.65	**11.08**	*<0.01*	**0.44**
Spare time activities	2.36	0.56	1.87	0.54	**46.87**	*<0.01*	**0.90**
Spare time problems	1.69	0.65	1.46	0.58	**8.51**	*<0.01*	**0.38**
Activities with peers	2.14	0.78	1.64	0.63	**29.51**	*<0.01*	**0.71**
Problems with peers	1.63	0.74	1.47	0.61	3.15	0.08	0.23
Boy-girl relationships*	2.52	0.83	2.31	0.86	1.83	0.18	0.25
Problems with opposite sex*	1.23	0.50	1.37	0.55	1.87	0.17	−0.25
Relationship with siblings	1.79	0.70	1.70	0.66	1.04	0.31	0.14
Problems with siblings	1.49	0.67	1.54	0.64	0.29	0.59	−0.07
Relationship with mother	1.39	0.53	1.44	0.65	0.37	0.55	−0.08
Relationship with father	1.60	0.67	1.57	0.75	0.12	0.73	0.05
Problems with parents	1.58	0.70	1.28	0.51	**13.55**	*<0.01*	**0.49**
SAICA Total Score	1.78	0.36	1.57	0.38	**18.37**	*<0.01*	**0.56**

Note. SAICA, Social adjustment inventory for children and adolescents; OCD, obsessive-compulsive disorder; *d*, Cohen's d. * Due to the nature of these items only adolescents were asked to respond to these items (OCD $n = 56$, Controls $n = 62$). Bold font indicates significant results.

Table 3
Correlations between SAICA and CY-BOCS.

SAICA factors	CY-BOCS Obs	CY-BOCS Com	CY-BOCS total
	r	*r*	*r*
School behavior problems	0.13	0.17	0.14
Spare time activities	**0.26****	0.15	**0.23***
Spare time problems	0.12	0.10	0.12
Activities with peers	**0.23***	**0.25***	**0.25***
Problems with peers	0.14	0.07	0.12
Boy-girl relationships ±	**0.43****	**0.45****	**0.45****
Problems with opposite sex ±	**0.32***	**0.33***	**0.33***
Relationship with siblings	0.09	−0.02	0.04
Problems with siblings	0.06	−0.05	0.02
Relationship with mother	0.17	0.03	0.13
Relationship with father	0.12	0.05	0.10
Problems with parents	0.04	0.01	0.04
SAICA total	**0.35****	**0.24***	**0.32****

Note. SAICA, The Social Adjustment Inventory for Children and Adolescents; CY-BOCS, Children's Yale-Brown Obsessive-Compulsive Scale; CY-BOCS Obs, CY-BOCS obsession severity score; CY-BOCS Com, CY-BOCS compulsion severity score; CY-BOCS Total, CY-BOCS total score. ± Due to the nature of these items only adolescents were asked to respond to these items (OCD $n = -56$, Controls $n = 62$). * $p < .05$ ** $p < .005$. Bold font indicates significant correlations.

Table 4
Stepwise regression of SAICA factor scores in CY-BOCS total score age ≥ 13.

Variable	*B*	β	*SE*	*p*	95 % CI	sr^2
Step 1: $F(1,31) = 11.72$, $p < .01$, $R^2 = 0.274$						
Boy-girl relationships	3.51	1.03	1.03	<0.01	[1.42,5.61]	0.52
Step 2: $F(2,30) = 9.56$, $p < .01$, $R^2 = 0.389$						
Boy-girl relationships	3.19	0.48	0.97	<0.01	[1.21,5.16]	0.52
Problems with the opposite sex	3.34	0.34	1.41	0.02	[0.467,6.22]	0.40
Step 3: $F(3, 29) = 8.75$, $p < .01$, $R^2 = 0.475$						
Boy-girl relationships	2.93	0.44	0.92	<0.01	[1.05,4.81]	0.51
Problems with the opposite sex	3.2	0.33	1.33	0.02	[0.48,5.92]	0.41
Problems with parents	−3.43	−0.30	1.58	0.04	[−6.66,−0.211]	−0.38
Step 4: $F(4, 28) = 8.66$, $p < .01$, $R^2 = 0.553$						
Boy-girl relationships	2.67	0.40	0.87	0.01	[0.88,4.45]	0.50
Problems with the opposite sex	2.91	0.30	1.26	0.028	[0.34,5.48]	0.40
Problems with parents	−3.63	−0.31	1.48	0.021	[−6.67,-0.60]	−0.42
Spare time activities	2.77	0.28	1.26	0.036	[0.20,5.35]	0.39

Note. SAICA, The Social Adjustment Inventory for Children and Adolescents; CY-BOCS, The Children's Yale-Brown Obsessive-Compulsive Scale.

(current and past). Specifically, compared to controls, the OCD group had significantly lower scores on current (Cohen's $d = 0.50$) and past ($d = 0.31$) cohesion, and significantly higher scores in current ($d = 0.28$) and past ($d = 0.28$) conflict. No significant differences were found on either subscales of 'expression' (see Table 5).

A correlation analysis was performed to examine the association between CY-BOCS scores and FES subscale scores. No significant correlations between the two measures were found (see Table 6).

Similar to the SAICA analyses, we computed a stepwise regression to identify relative association between the CY-BOCS total score and FES outcomes. The regression model was not significant.

3.4. School functioning

A series of Person's X^2 tests were computed to examine group differences across different education accommodations and school variables. Results revealed that the rates of past enrollment in special classes in the OCD proband group (15.3 %) were significantly higher than the control group (2.1 %; $p < .01$). Further, rates of current enrollment in special classes in the OCD proband group (10.2 %) were significantly higher than the control group (2.1 %; $p < .01$). Similarly, rates of receiving extra help in the past in the OCD group (58.5 %) were significantly higher than the control group (21.8 %; $p < .01$). Finally, the rates of receiving current extra help among the OCD proband group (63.8 %) were significantly higher than the control group (4.3 %; $p < .01$), entailing a 15 fold difference. However, there was no significant difference between the OCD proband group and control group in repeating grades (see Table 7).

To examine the impact of OCD symptom-severity on school function, a series of ANOVAs comparing the CY-BOCS total score between OCD probands receiving or not receiving school accommodations revealed that CY-BOCS total scores among OCD probands placed in a special class ($M = 23.71$, $SD = 5.13$) were significantly higher than among those not placed in a special class ($M = 20.37$, $SD = 5.63$; $F(1,117) = 5.24$, $p = .024$). There were no other significant differences found on CY-BOCS total score between OCD probands that received or did not receive accommodations in school (see Table 8).

Table 5
Family Environment Scale subdomains.

FES subscale	OCD		Control		*F*	*p*	*d*
	M	*SD*	*M*	*SD*			
Current expression	50.65	10.74	53.22	13.04	2.56	0.11	0.21
Past expression	49.04	12.00	50.32	14.99	0.48	0.49	0.09
Current cohesion	50.59	15.27	57.78	13.04	15.10	**<0.01**	**0.50**
Past cohesion	49.02	16.90	54.29	16.48	5.64	**0.02**	**0.31**
Current conflict	52.78	12.50	49.57	10.70	4.49	**0.04**	**0.28**
Past conflict	54.46	13.71	50.89	11.78	4.51	**0.04**	**0.28**

Note. FES, Family Environmental Scale. Bold font indicates significant results.

Table 6
Correlations between FES and CY-BOCS.

FES subscale	CY-BOCS Obs		CY-BOCS Com		CY-BOCS Total	
	r	*p*	*r*	*p*	*r*	*p*
Expression current	0.18	0.08	0.13	0.20	0.16	0.12
Expression past	0.02	0.86	0.06	0.56	0.01	0.91
Cohesion current	−0.08	0.46	0.02	0.85	−0.05	0.61
Cohesion past	−0.07	0.49	−0.04	0.70	−0.06	0.54
Conflict current	0.03	0.81	−0.03	0.76	0.01	0.95
Conflict past	0.08	0.46	0.04	0.72	0.08	0.44

Note. FES, Family Environmental Score; CY-BOCS, Children's Yale-Brown Obsessive-Compulsive Scale; CY-BOCS Com, Children's Yale-Brown Obsessive Compulsive compulsions subscale; CY-BOCS Obs, Children's Yale-Brown Obsessive Compulsive obsessions subscale.

Table 7
School accommodations between OCD probands and controls.

	OCD (N = 118)		Control (N = 142)		X^2	*p*
	n	%	*n*	%		
Repeated a grade	10	8.5 %	10	7 %	0.19	0.67
Special class (past)	18	15.3 %	3	2.1 %	14.99	**<0.01**
Special class (current)	12	10.2 %	1	0.7 %	12.15	**<0.01**
Extra help (past)	69	58.5 %	31	21.8 %	36.56	**<0.01**
Extra help (current)	44	63.8 %	6	4.3 %	45.36	**<0.01**

Note. OCD, Obsessive Compulsive Disorder. Bold font indicates significant results.

Table 8
CY-BOCS total score in OCD probands with vs without accommodations.

Accommodation type	CY-BOCS total score				*F*	*p*
	Accommodations		No accommodations			
	M	*SD*	*M*	*SD*		
Extra help	21.58	5.30	19.96	6.00	2.46	0.12
Repeated grade	21.90	3.81	20.75	5.80	0.37	0.54
Special class	23.71	5.13	20.37	5.63	5.24	0.02

Note. CY-BOCS, Children's Yale-Brown Obsessive-Compulsive Scale; M, mean; SD, standard deviation.

3.5. Comorbidities

To examine the impact of comorbid disorders we grouped probands with comorbidities into three categories that were sufficiently large to allow comparative statistical analyses: 1. OCD with conduct related disorders (i.e., ADHD, CD, and ODD), 2. OCD with comorbid affective disorders, and 3. OCD with comorbid anxiety disorders. These groups were compared to groups of OCD probands without such comorbidities. No significant differences were found between the OCD group with conduct related disorders and the rest of the OCD probands on the CY-BOCS total score as well as on all the FES outcomes, and all school functioning outcomes. However, several differences emerged on a number of SAICA subscales. Results revealed that the OCD group with comorbid conduct related disorders had significantly higher scores on activities with peers ($p = .03$), problems with siblings ($p < .02$), problems with parents ($p < .01$), and the SAICA total score ($p < .01$), all exemplifying the additional burden of conduct related disorders on these social adjustment factors. Comparing OCD probands with comorbid affective disorders to the rest of the OCD proband sample revealed no differences on the CY-BOCS, as well as on all SAICA and school functioning outcomes. However, analyses of the FES outcomes revealed differences on current ($p = .03$), and past conflict ($p = .02$), where probands with comorbid affective disorders scored significantly higher on those outcome measures. Finally, comparisons between OCD probands with any anxiety disorder to the rest of the OCD proband subsample revealed no significant differences across these outcome measures.

4. Discussion

The present study aimed to comprehensively examine psychosocial functional difficulties among a large well characterized sample of youths with OCD compared to controls. A comprehensive set of functional indices were assessed including relationships with peers, siblings, and parents, family environment, leisure time, and school functioning and accommodations. A secondary aim was to examine associations between these indices and OCD symptom severity as well as the potential confounding impact of comorbid conditions.

Our results document the higher prevalence of functional impairments in several psychosocial domains among youth with OCD. Youths with OCD were found to exhibit significantly more problems with school behavior (e.g., being disruptive or not participating), spare time behavior (e.g., having trouble playing alone, not being interested in activities), and with parent interactions compared to controls. Children with OCD were also found to engage less in free time activities, and with their peers. These findings are in accord with previous findings (Coluccia et al., 2017). In younger children (<13 years of age), only school behavior problems were associated with OCD symptom severity, while in those ≥13 years of age, symptom severity was associated with four different factors including two factors related to heterosexual relationships. These differences may reflect the differing developmental stages of the two age groups in our analysis; whereas younger children's symptoms may play out in the classroom, adolescents' symptoms may impact age-appropriate milestones including relationships with the opposite biological sex. Interestingly, in the older age group, relative to other factors, increased OCD severity was associated with *less* problems with parents. These results may be driven by findings repeatedly indicating increased OCD severity in teens compared to children with OCD (e.g., Abramovitch et al., 2022) which may promote statistically significant findings in this age group. In addition, it is possible that these results reflect a more pronounced behavioral inhibition tendencies among teens with OCD (Coles et al., 2006), and to increased parental accommodation in response to increased OCD symptom severity (Lebowitz et al., 2012) that may reduce conflicts with parents. Further, OCD symptom severity accounted for only 7.8 % of school behavior problems in the younger group, but 55.3 % in the adolescent group. This may suggest that OCD has a greater impact on adolescents' functioning given their increased social involvement compared to younger children.

Our results show that families of children with OCD are characterized by low levels of cohesion (the support and help that family members give to each other), high levels of conflict, and normative levels of expressiveness (the extent to which family members are encouraged to express their emotions). Previous work has found that families of children with OCD experience more strain and stress, parental guilt and fear, and parental anxiety, which may contribute to conflict among family members and a decreased capacity to provide emotional support (Murphy and Flessner, 2015; Storch et al., 2009b). Low levels of cohesion and high levels of conflict have similarly been reported in families with children with bipolar disorder (Belardinelli et al., 2008). Family cohesion is an important factor in children's social and cognitive development. For example, research has established links between strong family cohesion and academic achievement (Chawla and Derr, 2012) as well as weaker family cohesion and problem behaviors (Church et al., 2009). Given that impairment in school functioning has been documented as one of the most common areas of dysfunction for this population, it is not surprising that we found significantly more youth with OCD had a special class placement or received extra help in school both in the past and present compared to nonpsychiatric controls. However, higher OCD symptoms-severity was positively correlated with only special class placement in children with OCD while there was no correlation with extra help. Notably, educational impairment did not amount to greater rates of repeated grades in youth with OCD compared to controls, suggesting that accommodations as needed may mitigate risk and cognitively minor deficiencies are not sufficient to prove repeated grade level functional impairments. A previous investigation in children with OCD reported rates of 7 %, 40 %, and 48 % for repeated grades, special class placement, and remedial help, respectively (Geller et al., 1996). While this rate of repeated grades is in accord with our findings, we found a lower occurrence of special class placement and a higher occurrence of extra help. This discrepancy may be related to the sample's composition since all participants in the Geller et al. (1996) were recruited from a pediatric OCD specialty clinic, but about one sixth of OCD probands comprising the present study's sample were recruited through advertising or physician referral.

Finally, examination of the impact of comorbid disorders showed that comorbidity of OCD with any of the three categories (i.e., conduct related disorders, affective disorders, and anxiety disorders) did not impact OCD severity, or school functioning. However, comorbid conduct related disorders (i.e., ADHD, CD, ODD) were associated with worse functioning with peers, siblings, and parents. These results are in accordance with multiple studies indicating that comorbidity with these disorders are associated with lower quality of life and increased functional impairment in OCD youth (Geller et al., 1996; Storch et al., 2010b). Interestingly, comorbid affective disorders only had an impact on family conflict but not on other measures of psychosocial functions, school functioning, or OCD severity, whereas comorbid anxiety disorders did not demonstrate any significant impact across study outcomes. These results reflect previous research showing that affective symptoms have a significant impact on quality of life and functioning, whereas anxiety related comorbidities do not possess such effect (e.g., Vivan Ade et al., 2013). However, it is important to note that our findings related to anxiety disorders or to the lack of additional impact of conduct related disorders on school functioning do not suggest that these comorbid disorders are not associated with psychosocial dysfunction, but rather that their presence among youths with OCD does not add additional burden on specific psychosocial facets.

5. Conclusion

Taken together, the results of this study strongly indicate that pediatric OCD is associated with a host of psychosocial impairments across multiple life domain, that are largely associated with OCD severity, and

that some aspects of psychosocial functioning may be further exacerbated by the presence of comorbid conduct related, and affective disorders. These findings suggest that effective treatment for OCD in youth may lead to improvement in psychosocial functioning. However, surprisingly, there is a dearth of research on the subject. Nevertheless, existing studies suggest that among youth with OCD, symptom reduction in the context of treatment leads to significant improvement in psychosocial functioning across domains (Sperling et al., 2020). Therefore, there is a need for additional research in this specific area. In addition, psychosocial functioning is rarely assessed in clinical settings, where the focus is usually on symptom reduction. Clinicians are therefore advised to address and monitor psychosocial functioning in the context of CBT for pediatric OCD. Furthermore, the results of the present study, along with evidence highlighting the lack of proficiency in identifying and treating OCD in school settings and the limited use of OCD assessment measures in schools (Sloman et al., 2007), emphasize the critical need for training school psychologists in the assessment and treatment of pediatric OCD. Finally, future research should address the open question regarding the relative contribution of OCD related symptoms (e.g., reassurance seeking, reduced confidence in memory) versus neurocognitive function in accounting for psychosocial impartments, particularly in school settings.

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CRediT authorship contribution statement

Amitai Abramovitch: Writing – review & editing, Writing – original draft, Methodology, Investigation, Formal analysis, Conceptualization. **Bowie Duncan:** Writing – review & editing, Writing – original draft, Formal analysis. **Mckenzie Schuyler:** Writing – review & editing, Writing – original draft. **Daniel A. Geller:** Writing – review & editing, Supervision, Resources, Project administration, Investigation, Funding acquisition, Data curation, Conceptualization.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Daniel Geller reports financial support was provided by National Institute of Mental Health. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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