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Hoarding Symptoms in Children and Adolescents With Obsessive-Compulsive Disorder: Clinical Features and Response to Cognitive-Behavioral Therapy

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Abstract

Objective: Although adult hoarding disorder is relatively common and often debilitating, few studies have examined the phenomenology of pediatric hoarding. We examined the clinical phenomenology and response to cognitive-behavioral therapy (CBT) treatment in youths with a diagnosis of obsessive-compulsive disorder (OCD) with and without hoarding symptoms. Age was tested as a moderator across analyses, given prior findings that the impact of hoarding symptoms may not become apparent until adolescence.

Method: Youths (N = 215; aged 7–17 years) with OCD pursuing evaluation and/or treatment at a university-based specialty clinic participated in the current study. Presence of hoarding symptoms was assessed as part of a larger battery. Data from a subset of youths (n = 134) who received CBT were included in treatment response analyses.

Results: Youths with hoarding symptoms did not differ from those without hoarding symptoms with respect to overall OCD symptom severity and impairment. Youths with hoarding met criteria for more concurrent diagnoses, including greater rates of internalizing and both internalizing/externalizing, but not externalizing-only, disorders. Youths with and without hoarding symptoms did not significantly differ in rate of response to CBT. Age did not moderate any of these relationships, suggesting that the presence of hoarding symptoms was not associated with greater impairments across the clinical presentation of OCD or its response to treatment by age.

Conclusion: We found no evidence that hoarding is associated with greater OCD severity or poorer treatment response in affected youth. Theoretical and clinical implications of these findings, including future directions for research on testing developmental models of hoarding across the lifespan, are discussed.

Keywords

pediatric; OCD; hoarding

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Compulsive hoarding is defined as the excessive acquisition and inability to discard possessions of little value.[1] Increasingly, hoarding is recognized as a mental health problem that is both relatively common and debilitating. Clinically significant hoarding behaviors affect between 1.5%[2] and 4%[3,4] of adults. The condition is associated with significant functional impairment,[5] and poses considerable public health risk due to its chronicity and potential public safety concerns.[6,7]

Although hoarding behaviors are well studied in adults,[8–12] these symptoms predominantly onset prior to adulthood (between ages 11 and 15 on average[13]), with an estimated 2% of adolescents exhibiting clinical levels of hoarding.[14] There is relatively scant literature on child/adolescent manifestations or developmental trajectories of hoarding. Thus, there is a clear need to better understand the phenomenology and treatment of hoarding in youth. Such work may provide targets for treating the condition during the pediatric period, which in turn may improve individuals' functioning across the lifespan.

Unlike the common presentation of hoarding without co-occurring OCD in adults,[15] few youths report hoarding symptoms in the absence of other OCD symptoms,[16] and up to 30% of youths with OCD diagnoses report hoarding symptoms.[17] As hoarding rarely presents in the absence of OCD in youths, studying pediatric hoarding in the context of OCD may be informative. A handful of studies have examined associated features of pediatric hoarding, finding that youths with OCD diagnoses and hoarding symptoms reported earlier age of OCD onset,[18] more severe current[19] and lifetime[18] OCD, and higher rates of internalizing disorder comorbidity.[17,18,20] Moreover, a recent meta-analysis suggests hoarding symptoms are predictive of poorer treatment response in both youths and adults with OCD[21]; however, findings for youths appear to be driven by a naturalistic follow-up study of youths treated with pharmacotherapy.[19] In contrast, the single empirical investigation that examined the relationship between specific pediatric OCD symptoms and cognitive-behavioral therapy (CBT) response found no difference in response between youths with and without hoarding symptoms.[22]

Although the above-described studies provide preliminary information about the phenomenology of hoarding in youth, they also raise questions about the role of development in the expression of hoarding and its sequelae. Hoarding is correlated with earlier OCD onset in youth[19] and tends to worsen with age in adulthood,[23] suggesting that age may play an important role in hoarding phenomenology. To our knowledge, no study to date has assessed the potential influence of age in the relationship between hoarding symptoms and OCD characteristics in youth. Thus, a primary goal of the present study was to test age as a putative moderator of hoarding symptom presence in pediatric OCD, its clinical correlates, and CBT response. Our aims were two-fold. First, to benchmark against the extant pediatric literature,[18] we sought to characterize the hoarding phenotype in youths with OCD in a large, well-characterized sample of youths with primary OCD. Second, we explicitly examined age as a moderator of the relationship between presence of hoarding symptoms in pediatric OCD and three sets of outcomes: (1) clinical variables (OCD severity and impairment); (2) diagnostic comorbidity; and (3) treatment response to CBT. We hypothesized that age would moderate the relationship between hoarding symptoms and clinical outcomes such that, compared to the group without hoarding symptoms, youths with

hoarding symptoms would evidence greater impairments in clinical outcome and treatment response with increasing age. This hypothesis was based on adult findings that hoarding is treatment resistant[21] and becomes more problematic across the lifespan.[23] It was also based on theoretical proposals for a developmentally sensitive model of hoarding in youth.[24]

METHOD

Participants

Participating youths included 215 children and adolescents presenting for diagnostic assessment at a university-based research clinic specializing in the treatment of OCD and anxiety disorders. All parents provided consent and youths provided assent to participate in a research assessment battery that had been approved by the university's institutional review board. A subsample (n = 134) of the original 215 youths consented to participate in and were randomly assigned to receive CBT in one of three randomized clinical trials[25–27]; their data were used for treatment response analyses (Aim 3). This subsample did not significantly differ from youths who received an assessment but did not receive CBT on age [$t(213) = -0.33$, $p = .74$], gender [$\chi^2(1) = 0.04$, $p = .85$], baseline OCD severity [$t(213) = 0.87$, $p = .39$], or proportion of youths who presented with hoarding symptoms [$\chi^2(1) = 1.47$, $p = .69$].

Measures

Anxiety Disorders Interview Schedule for Children, Version IV.—The Anxiety Disorders Interview Schedule for Children, Version IV (ADIS) is a semi-structured diagnostic interview that assesses the major *DSM-IV* internalizing and externalizing disorders and that has demonstrated strong psychometric properties.[29,30] The ADIS was used to determine primary OCD diagnosis and to assess for other comorbid diagnoses.

Children's Yale—Brown Obsessive-Compulsive Scale.—The Children's Yale—Brown Obsessive Compulsive Scale (CYBOCS)[31] is a clinician-rated dimensional measure of OCD severity that includes a symptom checklist and total severity score. The severity score is derived from ratings for time spent on, resistance to, and control over symptoms, and interference and distress associated with symptoms. The CYBOCS has sound psychometric properties[31,32] and is the gold-standard dimensional, clinician-rated measure of youth OCD severity. The CYBOCS checklist was used to code for the presence or absence of the hoarding symptom cluster, which has previously been empirically derived.[33,34] Youths who endorsed either hoarding obsessions (fear of losing things; other hoarding/saving obsessions) and/or hoarding compulsions (difficulty throwing things away, saving bits of paper, string, etc.; other hoarding/saving compulsions) on the CYBOCS checklist were rated as meeting for the hoarding cluster.[33,34] The hoarding cluster was then used to divide the sample into groups of youths who did versus did not evidence hoarding symptoms; this was the primary predictor across analyses. The CYBOCS total score was used in this study to assess whether the presence of hoarding symptoms was associated with worse symptom severity at baseline, as well as to assess symptom severity change following CBT. In this sample, Cronbach's α for the CYBOCS total severity score was 0.87.

Children's Obsessive Compulsive Impact Scale-Revised.—The Children's Obsessive Compulsive Impact Scale-Revised (COIS-R)35 is a 27-item youth- and parent-report questionnaire that assesses OCD-specific functional impairment across home, school, and social domains of functioning. The COIS-R was used in this study to assess whether the presence of hoarding symptoms was related to worse functional impairment by youth and parent. Cronbach's α for the COIS-R was 0.75 for parent report and 0.80 for child report.

Clinical Global Impressions-Improvement.—The Clinical Global Impressions-Improvement (CGI-I)[36] is a clinician-rated measure of improvement that is commonly used to indicate treatment response in clinical trials. A CGI-I score of 1 ("much improved") or 2 ("very much improved") was used as the primary measure of CBT treatment response.

Procedure

Youth seeking assessment and/or treatment for OCD completed an initial research diagnostic evaluation and assessment battery, from which the measures in this study were drawn. The ADIS-IV and CYBOCS were conducted with both youth and parent by doctoral-level psychologists or doctoral students in clinical psychology; all doctoral students were trained and supervised by doctoral-level psychologists, with weekly supervision and case consensus. Parents and youths completed the COIS-R. Eligible youths were then offered participation in one of three randomized controlled trials.[25–27] A subset of youths (n = 134) consented to participate in and were randomly assigned to receive 12 sessions of manualized CBT[37] in one of these three treatment trials[25–27]; their data were used for the CBT treatment response analyses.

Statistical Analyses

The hoarding symptom cluster on the CYBOCS was previously derived by Stewart *et al.*[33,34] Cluster assignment was dichotomous (yes/no); if youths met criteria for any current symptom in the hoarding cluster as rated by clinician, they were included in the hoarding symptoms group. Presence/absence of hoarding symptoms was the primary predictor in analyses except where otherwise specified. Descriptive statistics, including frequencies, means, and χ^2 were used to characterize the sample (Table 1).

In addition to characterizing the hoarding phenotype across demographic and other clinical characteristics, we aimed to test age continuously as a putative moderator between the presence of hoarding symptoms and outcomes of interest. Specifically, we tested whether age moderated the relationship between the presence of hoarding symptoms and other clinical variables (Aim 1: OCD severity and impairment), diagnostic comorbidity (Aim 2: total number of comorbid diagnosis; internalizing and/or externalizing comorbidity), and treatment (Aim 3: treatment response; OCD severity reduction). Across aims, analysis of covariance was used for continuous outcomes, and binomial and multinomial logistic regression was used for categorical outcomes (including treatment response on the CGI-I). All models included group (hoarding versus no hoarding symptoms), age (continuous), and a group × age interaction. We decided a priori that if the interaction term was not significant, it would be dropped from models, and that (in the absence of significant interaction) if age was not a significant predictor, age would also be dropped from models, to explore the

potential significance of group on outcome excluding nonsignificant terms. For the analysis of covariance testing CBT response on the CYBOCS total severity score from pre- to posttreatment, time was included as a repeated-measures factor.

RESULTS

Sample Characterization

Youths were 7 to 17 years of age (mean = 12.25, SD = 2.75), 57% female, and identified as 74% white, 11% Hispanic, 4% Asian, 1% African American, 1% American Indian, and 9% mixed. All youths were diagnosed with primary OCD, and 14% were on psychotropic medications. Additional demographic and clinical information for the total sample and by hoarding group are presented in Table 1.

Of the total sample, 43% of youths reported current hoarding symptoms: 8% reported hoarding obsessions, 9% reported hoarding compulsions, and 26% reported both hoarding obsessions and compulsions. Youths with versus without hoarding symptoms did not significantly differ in regard to age [t (213) = 0.45, p =.65], minority status [χ^2 (1) = 0.00, p =.99], or psychotropic medications [χ^2 (1) = 0.95, p =.33]. Although approximately half (51%) of girls reported hoarding symptoms, only 37% of boys reported hoarding [χ^2 (1) = 4.52, p =.03]. All youths (100%) in the hoarding group met for OCD symptoms (eg, washing/cleaning; checking, symmetry, etc) on the CYBOCS symptom checklist.

OCD Severity and Impairment

In regard to OCD severity (CYBOCS total score), there was not a significant group × age interaction ($F_{1,211}$ = 0.57, p =.44), nor were there significant main effects of group ($F_{1,211}$ = 0.15, p =.70) or age [$F_{1,211}$ = 3.43, p =.07]. When age and the interaction term were removed from the model, the effect of group remained nonsignificant ($F_{1,213}$ = 2.53, p =.11), such that OCD severity did not differ between youths with (mean = 25.43, SD = 3.93) versus without (mean = 24.49, SD = 4.58) hoarding symptoms. For youth-reported OCD-related impairment (COIS-R child report), there was no significant group × age interaction ($F_{1,211}$ = 0.99, p =.32), nor were there significant main effects of group ($F_{1,211}$ = 0.56, p =.46) or age ($F_{1,211}$ = 2.68, p =.12). When age and the interaction term were removed from the model, the effect of group remained nonsignificant ($F_{1,213}$ = 0.86, p =.35), such that youth-rated OCD-related impairment did not differ between youths with (mean = 27.08, SD = 27.06) and without (mean = 23.63, SD = 25.66) hoarding symptoms. In parallel, for parent-reported OCD-related impairment (COIS-R parent report), there was no significant group × age interaction ($F_{1,211}$ = 1.22, p =.27), or significant main effects of group ($F_{1,211}$ = 1.04, p =.31) or age ($F_{1,211}$ = 2.68, p =.10). When age and the interaction term were removed from the model, the effect of group remained nonsignificant ($F_{1,213}$ = 0.05, p =.82) such that parentrated OCD-related impairment did not differ between youths with (mean = 28.91, SD = 25.84) and without (mean = 28.11, SD = 23.93) hoarding symptoms.

Comorbid Diagnoses

There was a significant main effect of group on the total number of internalizing (anxiety, depression) and externalizing (ADHD, oppositional defiant disorder, conduct disorder)

diagnoses, but no main effect of age ($F_{1,211}$ = 1.05, p =.31), and no group × age interaction ($F_{1,211}$ = 0.001, p =.98). When age and the interaction term were removed from the model, youths with hoarding symptoms had a greater total number of comorbid diagnoses (mean = 1.5, SD = 1.32) than those without hoarding symptoms (mean = 0.78, SD = 0.93; $F_{1,213}$ = 21.98, p <.001).

Youth were also split into those with (internalizing, externalizing, both internalizing and externalizing) and without comorbid diagnoses. Age was not a significant predictor (p values ranged from .23 to .74) and there was no significant group × age interaction (p values ranged from .0 to .82) for any comorbid diagnostic category. When age and the interaction were removed from the model, youths with hoarding symptoms compared to those without hoarding symptoms were more likely to have concurrent internalizing disorders (odds ratio [OR] = 4.89, SE = 0.43, p <.001, 95% CI = 2.12—11.25) and both internalizing and externalizing disorders (OR = 3.20, SE = 0.86, p =.02, 95% CI = 1.74—9.94), but not externalizing disorders only (OR= 1.71, SE = 0.86,p =.80,95% CI = −0.05 to 5.39).

Treatment Response and Symptom Reduction Following CBT

With respect to treatment response (CGI-I), there was no significant group × age interaction (OR = 0.82, SE = 0.13, p =.14, 95% CI = 0.64—1.06), nor were there significant main effects of group (OR = 17.50, SE = 1.66, p =.08, 95% CI = 0.68—8.22) or age (OR = 1.03, SE =.10, p =.80, 95% CI = 0.84—1.25). When age and the interaction term were removed from the model, the effect of group remained nonsignificant (OR = 1.52, SE = 0.36, p =.25; 95% CI = 0.75—3.07) (Figure 1a), such that youths with and without hoarding symptoms did not significantly differ in rates of treatment response (50% versus 60%). Similarly, in regard to change in CYBOCS severity from pre- to posttreatment, there was no significant group × age interaction ($F_{1,130}$ = 1.67, p =.16), nor were there significant main effects of group ($F_{1,130}$ = 2.28, p =.08) or age ($F_{1,130}$ = 0.82, p =.37). When age and the interaction term were removed from the model, the effect of group remained nonsignificant ($F_{1,130}$ = 0.20, p =.66) (Figure 1b), with comparable reduction in CYBOCS score between youths with (mean difference = 10.24, SD = 7.63) and without (mean difference = 10.90, SD = 8.59) hoarding symptoms.

DISCUSSION

Hoarding is increasingly recognized as a chronic, impairing condition with public health implications[5,38]; yet, little is known about its manifestations in pediatric populations. We examined the clinical phenomenology and response to CBT treatment in youths with primary OCD who did versus did not report hoarding symptoms, and explicitly examined the potential moderating role of youth age. We hypothesized that, as youth age increased, hoarding symptoms would be associated with more severe OCD symptoms, impairment, and comorbidity profiles, as well as poorer treatment response.

Broadly, our findings did not support our developmental hypothesis: across all analyses, age did not moderate the relationship between the presence of hoarding symptoms and clinical or treatment outcome variables. These results provide initial support for the observation that adolescents with OCD and hoarding symptoms do not appear to have more severe OCD

symptoms, impairment, or comorbidity profiles than children with OCD and hoarding. These data are in contrast to findings from the adult literature that suggest that adult hoarders tend to have more functional impairment and worse diagnostic profiles as they age.[39] Interestingly, adult hoarders tend to report symptom onset during the pediatric period,[13,23,39] although there is some evidence to suggest that the mean age of clutter and difficulty discarding (~ 16 years) may precede acquisition symptoms (~18 years[40]). This is not surprising, as youths often do not have the financial resources or control over their living space that might allow for excessive acquisition. Thus, it may be possible that our age range (7—17 years) precluded our ability to detect the adverse effects of hoarding during the transition to adulthood. Future investigations of hoarding might explore the moderating role of age from childhood through adulthood to identify the developmental window at which hoarding symptoms worsen and result in more substantial impairments, as well as the role of parents or other caretakers in accommodating hoarding (or refusal to do so).

Our hypotheses were partially supported with respect to comparing OCD-affected youths with and without hoarding symptoms. In contrast to some prior findings with youth,[18,19] we did not find group differences in OCD severity or youth- or parent-reported OCD-related impairment. However, consistent with other research[17,18,20] and as hypothesized, we found group differences in comorbidity profiles, such that youths with hoarding symptoms had a greater number of comorbid diagnoses and, particularly, concurrent internalizing and both internalizing and externalizing disorders, than those without hoarding symptoms. Thus, although impairment may not differ between youths who report hoarding compared to those who do not, their co-occurring psychopathology may complicate their clinical presentation and shape their subsequent treatment plan.

Finally, in contrast to our hypotheses and prior findings in adults,[21] and consistent with a prior, smaller investigation in youths,[22] in this sample we did not find statistically significant group differences between youths with and without hoarding symptoms in treatment response or OCD symptom severity reduction following CBT. This finding is generally consistent with our other results. If replicated, these findings may suggest that the adult hoarding literature may not accurately reflect the presentation, age-related impairment, or treatment response for youths with hoarding symptoms. In the context of the adult literature, our findings may suggest that the impairment-related sequelae of hoarding may not become evident until adulthood; it would therefore follow that hoarding may not result in worse treatment outcome until adulthood either. Nonetheless, we are encouraged by these findings as, clinically, they provide initial support for the notion that the presence of hoarding symptoms might not negatively influence CBT response in youths with OCD.

This investigation is not without its limitations. First, as with prior investigations,[17,18] the way in which the sample was ascertained and our measurement of hoarding symptoms may not fully reflect the population of youths with hoarding. Youths were recruited prior to *DSM-5* for primary OCD (which, at the time, included hoarding symptoms). In addition, we used a diagnostic tool (ADIS-IV)[28] in which hoarding symptoms are conceptualized as part of an OCD diagnosis. Thus, we are unable to explore whether youths in our sample would have met criteria for a hoarding disorder diagnosis in addition to OCD, or whether they would only have met criteria for subclinical hoarding symptoms. For some participants, it is

possible that the symptoms classified in the DSM-*IV-TR* OCD (or on the ADIS-IV) would have been fully accounted for by a hoarding disorder diagnosis in *DSM-5* or on the newer version of the ADIS created to reflect the *DSM-5*. Next, we dichotomized youths into those who did versus did not endorse hoarding symptoms on the CYBOCS. Although such categorization to identify symptom type has been validated in youths,[33,34] it likely does not fully capture the clinical presentation or severity of hoarding symptoms. Categorization of youths into groups of those who do versus do not endorse hoarding symptoms may not generalize to youths who present with hoarding disorder or subclinical hoarding symptoms in the absence of OCD symptoms. Thus, the present findings are limited to conceptualization of hoarding symptoms as acquired on the CYBOCS symptom checklist, and may not generalize to youths with hoarding disorder or those with hoarding symptoms not directly assessed by the CYBOCS symptom checklist. Future investigations might use recently published measures that are specifically designed to assess hoarding behaviors in youths[41] and assess both diagnostic categorization and hoarding-specific severity and impairment. In addition, a lack of statistically significant differences between groups does not confirm a true lack of difference between groups; we look forward to future replication studies in youths with primary OCD and those with primary hoarding disorder. Finally, the current sample was primarily of white ethnicity, which may limit our ability to generalize these findings to minority youths.

In summary, 43% of our sample reported hoarding symptoms, and all youths in the hoarding group also reported symptoms from at least one other OCD cluster. These data suggest that, particularly during the pediatric period, hoarding should be assessed as part of standard OCD symptom assessment and vice versa. Moreover, this study provides preliminary support for the notion that the findings from the adult hoarding literature may not necessarily be applied to youths with OCD and hoarding symptoms. In contrast to the adult literature, which has found that hoarding symptoms are associated with a worse clinical picture as adults age, our findings provide initial support that youths with hoarding symptoms do not have worse OCD severity, impairment, or treatment outcome, although they may have greater rates of diagnostic comorbidity. Future work might seek to understand the progression of hoarding from childhood through adulthood in both cross-sectional and longitudinal investigations, with an eye toward identifying sensitive developmental windows in which hoarding begins to be associated with greater impairment and less favorable treatment outcome.

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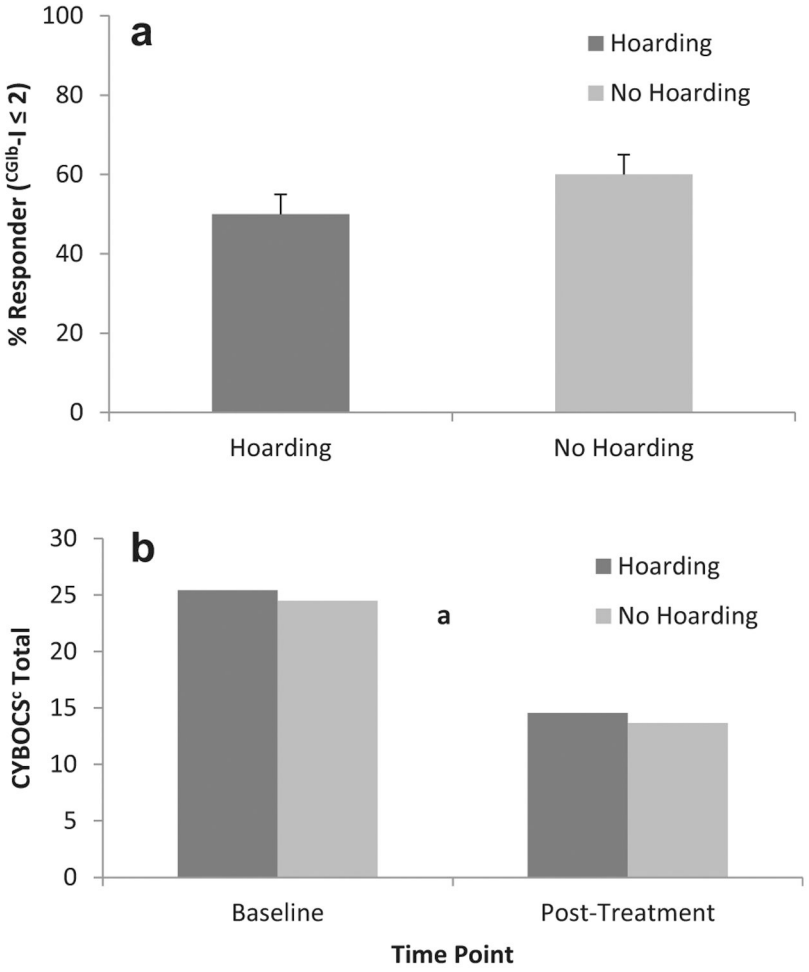

FIGURE 1.

Treatment Response and Symptom Reduction After Receipt of Cognitive-Behavioral Therapy (CBT) in Youths With and Without Hoarding Symptoms

[a]Indicates significant reduction in both groups from pre- to post-CBT($p < .05$), although the hoarding symptom group did not differ from the no hoarding symptom group at either pre- or posttreatment.

[b]CGI-I = Clinical Global Impressions-Improvement.[36]

[c]Children's Yale-Brown Obsessive Compulsive Scale.[31]

TABLE 1

Demographic and Clinical Characteristics for Full Sample and by Group

Characteristic	Total Sample (N=215)	Hoarding Symptoms (n=92)	No Hoarding Symptoms (n=123)
Age, y	12.25 (2.75)	12.15 (2.80)	12.33 (2.72)
Sex, % female *	43%	51%	37%
Minority status, % minority	26%	26%	26%
Psychotropic medication use, %	13%	11%	15%
CYBOCS[a] total severity score	24.89 (4.33)	25.43 (3.93)	24.49 (4.58)
COIS-R[b] Child total score	25.12 (26.28)	27.08 (27.09)	23.63 (25.66)
COIS-R[b] Parent total score	28.46 (24.72)	28.91 (25.84)	28.11 (23.93)
Comorbid diagnoses, %[c]			
Anxiety disorders	47%	65%	33%
Depressive disorders	9%	12%	7%
ADHD	12%	10%	13%
Oppositional defiant disorder	5%	7%	3%
Conduct disorder	1%	1%	0%
Tourette/chronic tic disorder	9%	10%	8%

Note: ADHD = attention-deficit/hyperactivity disorder.

[a]CYBOCS = Children's Yale-Brown Obsessive Compulsive Scale.[31]

[b]COIS-R = Children's Obsessive Compulsive Impact Scale-Revised.[35]

[c]Anxiety disorders include generalized anxiety, separation anxiety, and social phobia; depressive disorders include major depressive disorder and dysthymia; attention-deficit/hyperactivity disorder includes inattentive, hyperactive, and combined subtypes; Tourette/chronic tic disorder includes Tourette's disorder and chronic vocal and motor tic disorders.

*$p < .05$