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ORIGINAL ARTICLE

Children's Florida Obsessive Compulsive Inventory: Psychometric Properties and Feasibility of a Self-Report Measure of Obsessive–Compulsive Symptoms in Youth

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Abstract This report describes the development and psychometric properties of the Children's Florida Obsessive Compulsive Inventory (C-FOCI). Designed specifically as a brief measure for assessing obsessive–compulsive symptoms, the C-FOCI was created for use in both clinical and community settings. Study 1 included 82 children and adolescents diagnosed with primary Obsessive–Compulsive Disorder, and their parents. The Children's Yale-Brown Obsessive–Compulsive Scale (CY-BOCS) was administered to assess symptom severity. Thereafter, parents completed the Child Obsessive–Compulsive Impact Scale—Parent Version and Child Behavior Checklist, and youth completed the C-FOCI, Child Obsessive–Compulsive Impact Scale—Child Version, Multidimensional Anxiety Scale for Children, and Children's Depression Inventory—Short Form. A subgroup of 21 individuals was retested with the C-FOCI after completing 14 sessions of intensive cognitive-behavioral therapy. Construct validity of the C-FOCI was supported vis-à-vis evidence of treatment sensitivity, and moderate relations with clinician-rated symptom severity, the CY-BOCS Symptom Checklist, child- and parent-rated functional impairment, child-rated anxiety, and parent-rated internalizing symptoms. Discriminant validity was evidenced by weak relationships with parent-reports of externalizing symptoms. For Study 2, 191 non-clinical adolescents completed the C-FOCI to assess the feasibility of internet administration. Overall, internal consistency was acceptable for the C-FOCI

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Symptom Checklist and Severity Scale, and respondents were able to complete the measure with little difficulty. Taken together, the findings of Studies 1 and 2 provide initial support for the reliability and validity of the C-FOCI for the assessment of pediatric obsessive–compulsive symptoms.

Keywords Obsessive–Compulsive disorder · Children · Assessment · Treatment · Validity · Reliability

Introduction

The hallmark of obsessive–compulsive disorder (OCD) is recurrent, distressing intrusions and/or repetitive ritualistic behaviors that are impairing. More common than previously thought, epidemiological studies have suggested prevalence rates of OCD in children and adolescents at ~1–3% [1–4]. Despite its impairing nature [5], a large proportion of children and adolescents with OCD are not identified and linked to appropriate treatment services [6]. A need exists for reliable and valid instruments to screen for OCD in this population that can be administered in various settings (e.g., schools, internet, primary care provider offices) and can also be used to monitor treatment progress and outcome.

Currently, the gold standard instrument in the assessment of OCD symptom presence and severity is the clinician-administered Children's Yale-Brown Obsessive–Compulsive Scale (CY-BOCS) [7]. The CY-BOCS is administered to parents and children and has demonstrated positive psychometric properties [7, 8] and treatment sensitivity [9]. However, the CY-BOCS takes significant clinician and patient time to administer and hence its use is not feasible in many clinical settings, nor would it be cost effective to use to screen for the presence of OCD in children and adolescents outside clinical settings. Thus, self report measures of OCD symptoms in youths may fill these important gaps by serving as brief screening tools in both clinical and non-clinical populations, and for measuring treatment effects in the context of treatment trials. To date, there are three self-report instruments designed to assess pediatric OCD symptoms, namely the Leyton Obsessional Inventory—Child Version survey (LOI-CV) [10], the Children's Obsessional Compulsive Inventory (CHOCI) [11], and the Obsessive Compulsive Inventory—Child Version (OCI-CV) [12].

Derived from the Leyton Obsessional Inventory—Child Version card sorting task [13], the 20-item LOI-CV survey form [10] consists of two subscales: one that records the presence or absence of symptoms; the other which assesses the degree of symptom impairment, if applicable. Both subscales are added to compute a total score. The LOI-CV survey form has good internal consistency ($\alpha = .81$) [10]. The factorial stability of the LOI-CV survey form is uncertain, as an initial study in a large non-clinical sample found a four-factor solution including all items [10], whereas a second factor analytic study in a community sample produced a three-factor solution consisting of 11 items [14]. Additionally, the LOI-CV survey form has limited positive predictive power (18%) [15] and modest 2-week test–retest reliability for 8–10-year-old non-clinical children ($r = .51$) [16]. It correlates moderately with clinician-ratings of OCD severity on the K-SADS-E ($r = .37$), and weakly with the Global Assessment of Functioning rating ($r = .18$) [17]. Some studies have supported the treatment sensitivity of the LOI-CV (e.g., [18]), while others have found the LOI-CV to be insensitive to treatment effects (e.g., [19, 20]).

The CHOCI is a self-report measure consisting of questions that assess the presence of obsessions and compulsions, as well as separate severity ratings for each. The CHOCI has a similar composition to the Children's Yale-Brown Obsessive–Compulsive Scale (CY-BOCS) [7] with a Symptom Checklist (separate for Obsessions and Compulsions), Obsessions and Compulsions Severity Scales, and a total Impairment Scale. The initial psychometric study of the CHOCI included 42 youth with OCD (age range 7–17 years, although most were adolescents). The CHOCI Impairment Scale correlated moderately with the Children's Yale-Brown Obsessive–Compulsive Scale ($r = .42$), and the CHOCI Obsessions and Compulsions Severity Scales correlated moderately with the corresponding CY-BOCS scales (rs $= .38$ and $.49$). Good internal consistency was noted for the CHOCI Obsessions and Compulsions Checklists, as well as the Obsessions and Compulsions Severity Scales ($\alpha > .80$). A cutoff score on the Impairment Scale of >17 yielded a sensitivity of 88% and specificity of 95% relative to non-clinical controls. Shafran and colleagues [21] recently revised the CHOCI (CHOCI-R) by reducing the number of symptoms included. In a sample of 285 youth with OCD, the CHOCI-R child-report version showed excellent internal consistency, moderate association with the CY-BOCS ($r = .55$), generally weak associations with measures of conduct problems, and good discriminant validity.

The OCI-CV is a brief, 21-item self-report measure of OCD symptoms for use in youth 7–17 years. The OCI-CV was developed as a downward extension of the Obsessive Compulsive Inventory for adults (OCI) [22, 23], a measure that has documented reliability and efficacy as a screening tool (see [24]). The OCI-CV is rated on a 3-point Likert-type scale and yields symptom severity scores across six domains of OCD (e.g., washing, hoarding, ordering, etc.). Findings from a sample of 109 youth (age range 7–17 years) with primary OCD suggest the OCI-CV total score and subscale scores have strong internal consistency (coefficient alpha's $\geq .81$), retest reliability, and sensitivity to treatment change, and generally support the use of the OCI-CV as a measure of OCD symptoms in youth [12].[1]

With the goal of creating a self-report instrument sufficiently brief for assessing obsessive–compulsive symptoms in clinical and non-clinical settings, we developed the Children's Florida Obsessive Compulsive Inventory (C-FOCI). This scale was developed to provide a method of assessing symptom presence and severity in youth with OCD, and to serve as a screening instrument for community and general clinical populations. Its brief nature allows it to be administered in a variety of settings. A primary difference from other pediatric OCD self-report measures is the breakdown of scale items into two parts: Symptom Checklist and Severity Scale (see below for a further description of the C-FOCI development). The Symptom Checklist provides a vehicle for the child to report the presence of 17 obsessions and compulsions that have been endorsed with relative frequency among youth with OCD. The Severity Scale is a unitary scale that assesses the severity of all obsessive–compulsive symptoms. The use of a unitary scale minimizes the impact of differing obsession and compulsion severities on the total score. For example, a child with primary obsessions with few accompanying compulsions would receive a

[1] Two measures that are commonly used in the pediatric OCD literature warrant mention given their relationship to the self-report measures described above. The Child Obsessive–Compulsive Impact Scale—Child and Parent Versions [5] are psychometrically sound 56-item, parent- or child-report questionnaires that assess OCD-related impairment in different areas of the child's functioning, including school, social, and home/family activities. The Obsessive Compulsive Scale of the Child Behavior Checklist [35] is an 8-item parent-rated measure of OCD presence with moderate to high sensitivity, specificity, convergent validity, and predictive validity [53–57].

maximum score of 20 on the CY-BOCS Severity Scale. Yet, this child would presumably have greater symptom severity than a child who received scores of 10 each on the Obsessions and Compulsions Severity Scales. To evaluate the psychometric properties of the C-FOCI, two studies were conducted. In Study 1, we ask five research questions with regard to youth with OCD: (1) What symptoms are frequently endorsed? (2) What are the internal consistency and inter-scale correlations of the C-FOCI? (3) Does the C-FOCI Severity Scale correlate with measures of obsessive–compulsive symptom severity, impairment, and anxiety, depressive, and behavioral symptomology? (4) Do items on the C-FOCI Symptom Checklist correlate more strongly with corresponding symptom dimensions on the CY-BOCS Symptom Checklist than with diverging symptom dimensions? and (5) Is the C-FOCI Severity Scale sensitive to treatment changes? In Study 2, we evaluate the feasibility of internet administration in a community sample of adolescents, and explore the prevalence and associated severity of obsessive–compulsive symptoms in this population.

Study 1

Method

Participants

Participants included 82 children and adolescents (39 males) who met criteria for a primary diagnosis of OCD, recruited from an OCD specialty clinic in the southeastern part of the United States. Ages ranged from 7 to 20 years ($M = 13.45$, SD = 3.01 years). The majority of participants were Caucasian (80.5%), 7.3% were Hispanic, 4.9% were African American, 4.9% were Asian, and 2.4% identified themselves as not belonging to any of these groups. Comorbid diagnoses in the OCD group, when present, were as follows: attention deficit hyperactivity disorder ($n = 25$), generalized anxiety disorder ($n = 23$), depressive disorder ($n = 14$), disruptive behavior disorder ($n = 26$), Tourette's or chronic tic disorder ($n = 7$), social phobia ($n = 9$), bipolar disorder ($n = 2$), agoraphobia without panic disorder ($n = 1$), separation anxiety disorder ($n = 2$), and enuresis ($n = 2$). OCD diagnoses were determined through (1) a clinical interview by the first author, (2) confirmation on the Anxiety Disorders Interview Schedule for DSM-IV: Parent Version (ADIS-IV-P) [25] with a clinical severity rating ≥ 4, (3) administration of the Children's Yale-Brown Obsessive–Compulsive Scale (CY-BOCS) [7], and (4) discussion about presentation with another experienced clinician. Status as the primary diagnosis was determined by patient and family reported distress and impairment, as well as findings on the ADIS-IV-P. A subsample of youth ($n = 21$) recruited through the same specialty clinic received 14 sessions of individual cognitive-behavioral therapy occurring over a 3-week period.

Measures

Children's Florida Obsessive Compulsive Inventory. The Children's Florida Obsessive Compulsive Inventory (C-FOCI) was developed as a brief, focused instrument for youth with OCD. It includes 17 self-report items that assess the presence of common obsessions and compulsions. Items were generated by several of the authors (EAS, LJM, WKG, TKM)

in a variety of ways: (1) through review of published reports of pediatric OCD symptoms (e.g., [7, 26]); (2) examining items that have been commonly endorsed on the CY-BOCS Symptom Checklist; (3) pilot testing to remove difficult to understand or rarely endorsed items (e.g., "Physically harming a loved one, pushing a stranger in front of a bus, steering your car into oncoming traffic; inappropriate sexual contact; or poisoning dinner guests"); (4) borrowing appropriate items from the Florida Obsessive Compulsive Inventory [27], which was developed by the 7th author in 1994 [Goodman (1994), unpublished data]; where needed, items were revised to ensure that the wording was appropriate for youth; and (5) the authors' clinical experiences of items commonly experienced by youth with OCD. Similar to the adult version [27], the C-FOCI consists of two parts: Symptom Checklist and Severity Scale. On the Symptom Checklist, youth endorse the presence or absence of symptoms by indicating "yes" (i.e., 1) or "no" (i.e., 0), based on whether they have experienced each of the symptoms in the past month. The Severity Scale consists of five items assessing the following constructs: time occupied, distress, degree of control, avoidance, and interference. An item focusing on resistance was not included, as it is in the CY-BOCS Severity Scale and because some research indicates that the resistance items possess the least favorable psychometric properties [28]. The Severity Scale is derived by summing the five severity items (range = 0–20) with higher scores corresponding to greater symptom severity.

Anxiety Disorders Interview Schedule for DSM-IV: Parent Version. The ADIS-IV-P [25] is a semi-structured diagnostic interview designed specifically to assess anxiety and mood disorders in youth, as well as to screen for other disorders such as externalizing behavior disorders, eating disorders, and psychosis. Diagnoses are determined by endorsement of symptoms reflecting DSM-IV diagnostic criteria, as well as receiving a distress/impairment severity rating of $\geq$4 (on a 0–8 scale). The ADIS-IV-P possesses good psychometric properties [29] and demonstrates sensitivity to treatment effects among youth with anxiety disorders [30].

Children's Yale-Brown Obsessive Compulsive Scale. The CY-BOCS [7] is a 10-item semi-structured clinician-administered measure of obsession and compulsion severity. Items are rated over the previous week on a five-point Likert scale ranging from 0 to 4, with higher scores corresponding to greater symptom severity. Items about obsessions and compulsions are summed to derive the Obsession and Compulsion Severity Scales, respectively. The Obsession and Compulsion Severity Scales are summed to derive the Severity Scale total score. In addition to the Severity Scale, the CY-BOCS contains a Symptom Checklist that assesses the presence or absence of a number of obsessions and compulsions. The CY-BOCS Severity Scale has exhibited good internal consistency (α = .90), test–retest reliability over 6 weeks (Total Score intraclass correlation coefficient = .79), and convergent and discriminant validity [7, 8, 31].

Child Obsessive Compulsive Impact Scale—Child and Parent Versions. The COIS-C/P [5] is a 56-item, parent- or child-report questionnaire that assesses OCD-related impairment in different areas of the child's functioning, including school, social, and home/family activities. For each item, the parent or child rates the child's level of impairment on 4-point Likert scale from *not at all* to *very much*. The COIS-C/P has good psychometric properties [5]. Cronbach's α in this sample was .72 for the COIS-C and .96 for the COIS-P.

Children's Depression Inventory—Short Form. The Children's Depression Inventory—Short Form (CDI-SF) [32] is a 10-item self-report measure that assesses the presence and severity of cognitive, affective, and behavioral symptoms of depression over a 2-week period. Based on the full 27-item version, the CDI-SF has exhibited adequate internal consistency (α = .80) and correlates strongly with the full version (r = .89), which has

excellent psychometric properties (see [31] for a review). Cronbach's α in this sample was .76.

Multidimensional Anxiety Scale for Children. The Multidimensional Anxiety Scale for Children (MASC) [33] is a 39-item self-report questionnaire that assesses symptoms of general, social, and separation anxiety in children and adolescents. Items are rated on a 4-point Likert scale with higher ratings indicating increasing symptom severity. The MASC exhibits a stable factor structure and adequate internal consistency, with an α of .90 for the total measure [33]. Test–retest reliabilities at intervals of three weeks and three months were high (*r*s = .88 and .87, respectively) [34]. Evidence supporting convergent and divergent validity of the MASC has been reported [33]. Cronbach's α in this sample was .92.

Child Behavior Checklist. The Child Behavior Checklist (CBCL) [35] is a 118-item parent-report measure of a wide range of child behavioral and emotional problems. Items are rated on a 3-point scale (0 = Not true; 1 = Somewhat or sometimes true; and 2 = Very or often true). The CBCL has established reliability and validity properties across clinical and non-clinical populations [35]. Only the Internalizing and Externalizing Scale scores were used in this study.

Procedures

Having obtained permission of the local institutional review board, written parental consent and child assent were obtained. Psychiatric diagnoses were established as noted above. Training in administration of the ADIS-IV-P and CY-BOCS included: (1) didactic training, (2) observation of five assessments conducted by experienced raters, and (3) administration of at least three assessments with in vivo supervision. Weekly supervisory meetings were held with the first author to review clinician ratings. Following administration of clinician-rated measures, children completed the C-FOCI, COIS-C, MASC, and CDI, while parents completed the COIS-P and CBCL.

Data Analyses

Frequency counts were computed for each of the C-FOCI Symptom Checklist items. Independent *t*-tests were used to examine gender and age differences in the C-FOCI Symptom Checklist and Severity Scale. Age was divided into two groups consisting of children between the ages of 7 and 12 years and adolescents between the ages of 13 and 20 years. The internal consistency of the C-FOCI Symptom Checklist and Severity Scale was assessed with the Kuder-Richardson-20 (KR-20) statistic for the Symptom Checklist and Cronbach's alpha [36] for the Severity Scale. Pearson product–moment correlations were computed to examine the relationships among C-FOCI scores and measures of OCD symptomology and impairment, as well as depressive and anxiety symptoms, and parent-rated internalizing and externalizing behaviors. Pearson product–moment correlations were computed between items on the C-FOCI Symptom Checklist that comprise factor analytically supported constructs (i.e., contamination/washing symptoms, aggressive obsessions and checking, hoarding, symmetry/ordering, sexual/religious obsessions [37]) and symptom dimensions on the CY-BOCS Symptom Checklist. Given the large number of correlational analyses conducted, only *p*-values less than or equal to .01 were considered significant to reduce the possibility of Type I error. Finally, treatment sensitivity of the C-FOCI Severity Scale was examined for the subset of participants who participated in therapy ($n = 21$) using a dependent sample *t*-test.

Results

Descriptive Statistics

The number of symptoms endorsed ranged from 1 to 13 ($M = 6.22$, SD = 3.54). The mean for the Severity Scale was 11.22 (SD = 4.07). Although boys and girls endorsed a similar number of symptoms on the Symptom Checklist (5.73 versus 6.66), girls with OCD endorsed greater symptom severity than did boys on the Severity Scale ($t(80) = -2.08$, $p < .05$; 10.26 ± 3.69 versus 12.09 ± 4.25) (see Table 1). A similar number of symptoms were reported on the Symptom Checklist for younger and older children (6.53 versus 6.02); however, older youth endorsed greater symptom severity than did younger children on the Severity Scale ($t(80) = -2.04$, $p = .05$; 10.06 ± 3.15 versus 11.92 ± 4.43). Severity Scale items were not differentially endorsed for those children who had no comorbid conditions versus those who had one or more comorbid conditions ($p > .05$).

Internal Consistency

Cronbach's alpha [36] was acceptable for the C-FOCI Severity Scale ($\alpha = .79$), and internal consistency for the C-FOCI Symptom Checklist was adequate (KR-20 = .76).

Correlations Among Study Measures

As seen in Table 2, the C-FOCI Severity Scale was significantly and moderately correlated with the CY-BOCS Severity Scale, CY-BOCS Obsession and Compulsion Severity Scales, parent- and child-rated OCD impairment, parent-reported internalizing symptoms, and child-rated depressive symptoms and anxiety symptoms. In general, correlations were moderate in strength with measures assessing OCD symptoms. However, as expected, significant correlations were observed between C-FOCI scores and scores on measures assessing anxiety and depression symptoms as well. The C-FOCI Severity Scale was not related to parent-rated externalizing behavior problems.

To further examine the construct validity of the C-FOCI Symptom Checklist, items that measure a particular domain of OCD symptoms (e.g., contamination) were summed to derive a composite scale and compared to the corresponding symptom dimension on the CY-BOCS Symptom Checklist (see Table 3). The C-FOCI contamination items were strongly related to the CY-BOCS contamination symptom dimension, but weakly to moderately related to other CY-BOCS symptom dimensions (rs = $-.28$ to .01). The C-FOCI aggressive obsessions and checking items were strongly related to the corresponding CY-BOCS symptom dimension, as well as to the CY-BOCS sexual and religious obsessions and contamination symptom dimensions. The C-FOCI aggressive obsessions and checking items were weakly related to the CY-BOCS hoarding and symmetry symptom dimensions. The C-FOCI sexual, religious, and somatic obsession items were moderately related to the CY-BOCS sexual/religious, aggressive/checking, and hoarding symptom dimensions. These items were weakly related to the CY-BOCS contamination and symmetry symptom dimensions. The C-FOCI items assessing symmetry and repeating were moderately related to the CY-BOCS symmetry, aggressive/checking, and hoarding symptom dimensions. These items were weakly related to the CY-BOCS contamination and sexual/religious obsessions symptom dimensions. Finally, the item related to hoarding on

Table 1 Frequencies, means, and standard deviations of the items of the C-FOCI

Item	OCD sample	Non-clinical sample	χ^2	p
1. Concerns with contamination (dirt, germs, chemicals, radiation) or acquiring a serious illness such as AIDS?	56.1	40.6	7.27	<.01
2. Overconcern with keeping objects (clothing, tools, etc.) in perfect order or arranged exactly?	35.4	25.5	3.66	.06
3. Images of death or other horrible events?	26.3	23.2	1.95	.16
4. Fire, burglary or flooding of the house?	42.7	29.7	5.29	.02
5. Accidentally hitting a pedestrian with your car or letting it roll down a hill?	18.3	24.2	1.56	.21
6. Spreading an illness (giving someone AIDS)?	8.5	15.5	3.56	.06
7. Losing something valuable?	41.5	68.5	23.94	<.01
8. Harm coming to a loved one because you weren't careful enough?	43.2	52.1	2.25	.13
9. Excessive or ritualized washing, cleaning or grooming?	53.7	19.7	44.23	<.01
10. Checking light switches, water faucets, the stove, door locks or the emergency brake?	28.0	20.7	2.31	.13
11. Counting, arranging; evening-up behaviors (making sure socks are at same height)?	51.2	20.6	38.07	<.01
12. Repeating routine actions (in/out of chair, going through doorway, relighting cigarette) a certain number of times or until it feels *just right?*	44.4	16.5	34.59	<.01
13. Needing to touch objects or people?	35.4	23.4	6.08	.01
14. Unnecessary rereading or rewriting; reopening envelopes before they are mailed?	36.6	26.4	3.66	.06
15. Examining your body for signs of illness?	22.5	16.1	2.34	.13
16. Avoiding colors ("red" means blood), numbers ("13" is unlucky) or names (those that start with "D" signify death) that are associated with dreaded events or unpleasant thoughts?	18.3	9.6	6.23	.01
17. Needing to "confess" or repeatedly asking for reassurance that you said or did something correctly?	63.4	44.0	12.00	<.01

C-FOCI severity scale	Mean (SD)	Mean (SD)	F value	p value
1. On average, how much time is occupied by these thoughts or behaviors each day?	2.35 (1.14)	.94 (1.05)	154.19	<.01
2. How much do they bother you?	2.46 (0.97)	.62 (.98)	431.06	<.01
3. How hard is it for you to control them?	2.48 (1.07)	.46 (.95)	590.91	<.01
4. How much do they cause you to avoid doing things, going places or being with people?	1.98 (1.09)	.35 (.83)	385.73	<.01
5. How much do they interfere with school, your social or family life, or your job?	1.95 (1.23)	.39 (.85)	337.71	<.01
C-FOCI Severity Scale	11.22 (4.07)	1.46 (1.92)	659.85	<.01

the C-FOCI (i.e., "losing something valuable") was only moderately related to the CY-BOCS hoarding symptom dimension, but was strongly related to the symmetry/ordering symptom dimension. This item was unrelated to the other CY-BOCS symptom dimensions (rs = −.14 to .20).

Table 2 Descriptive statistics and Pearson product–moment correlations among the C-FOCI and measures of psychological functioning

	C-FOCI Severity scale	Symptom checklist
CY-BOCS total	.498***	.318**
CY-BOCS obsessions	.541***	.253
CY-BOCS compulsions	.373**	.331**
COIS-P	.485***	.280
COIS-C	.417***	.401**
CDI-S	.405***	.351**
MASC	.396***	.607***
CBCL Internalizing	.479***	.361***
CBCL Externalizing	.112	.125

Note: C-FOCI, Children's Florida obsessive–compulsive inventory; CY-BOCS, Children's yale-brown obsessive compulsive scale; COIS-P, Children's obsessive–compulsive impact scale—parent version; COIS-C, Children's obsessive–compulsive impact scale—child version; CDI-S, Children's depression inventory—short form; MASC, Multidimensional anxiety scale for children

** $p \leq .01$ level

*** $p \leq .001$ level

Table 3 Correlations between C-FOCI domains and CY-BOCS symptom dimensions

C-FOCI domains	CY-BOCS symptom checklist				
	Contamination/ washing	Aggressive/ checking	Sexual/ religious	Symmetry/ ordering	Hoarding
Contamination	.53***	−.02	.01	−.28*	−.10
Aggressive/checking	.35**	.56***	.47***	.04	.20
Sexual/religious/ somatic	.18	.39***	.35**	.22	.39***
Symmetry	.07	.48***	.21	.39***	.44***
Hoarding	−.14	.20	−.04	.49***	.26*

Note: C-FOCI, Children's Florida obsessive–compulsive inventory; CY-BOCS, Children's yale-brown obsessive compulsive scale

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

Treatment Sensitivity

Following cognitive-behavioral treatment, scores on the C-FOCI Severity Scale were significantly decreased relative to baseline ($M_{\text{Pre-treatment}} = 11.48 \pm 4.42$; $M_{\text{Post-treatment}} = 6.95 \pm 4.97$, $t(20) = 4.39$, $p < .001$). The number of symptoms endorsed on the Symptom Checklist also significantly decreased ($M_{\text{Pre-treatment}} = 6.15 \pm 3.36$; $M_{\text{Post-treatment}} = 3.06 \pm 2.83$, $t(20) = 3.83$, $p = .001$).

Discussion

Results indicate that the C-FOCI is a psychometrically sound and valid measure for use with pediatric OCD patients. Levels of internal consistency were acceptable for both the Severity Scale and Symptom Checklist, and similar to those found for other widely used measures in the current sample (e.g., COIS-C/P, CDI-S). Modest intercorrelation between the Severity Scale and Symptom Checklist (i.e., $r = .34$) suggests a relative independence between the number of symptoms and overall symptom severity.

In support of the measure's construct validity, the C-FOCI Severity Scale was directly associated with the CY-BOCS Severity Scale, CY-BOCS Obsession and Compulsion Severity Scales, and parent- and child-ratings of OCD impairment. The magnitude of relations between the C-FOCI Severity Scale and CY-BOCS ratings was similar to that found by Shafran et al. [11] using the CHOCI (.38–.49 in that study). In addition, the C-FOCI Severity Scale was moderately related to child-reports of anxiety symptoms and parent-reports of general internalizing symptoms. The existence of a statistically significant, albeit modest, relationship between the C-FOCI Severity Scale and measures assessing internalizing symptoms is likely due to the high comorbidity of depressive disorders in children with OCD [4, 6]. Such findings of modestly high associations between self-reported OCD symptoms and depressive and anxiety symptoms have been commonly reported (e.g., [27, 38]). For example, Abramowitz and Deacon [38] found correlations between the Obsessive–Compulsive Inventory – Revised (OCI-R) Total Score and measures of depressive and anxiety symptoms (Beck Depression Inventory and State-Trait Anxiety Inventory-Trait Scale; rs $= .41$ and .47) to be similar to the relations between the OCI-R Total Score and scores on the Yale-Brown Obsessive–Compulsive Scale (rs $= .35$–.41). Similarly, the CHOCI-R child and parent-report severity scores were moderately related to Strengths and Difficulties Questionnaire subscales ($r = .30$–.51) [21]. It is also worth noting that shared method variance may have impacted the relations between the C-FOCI and CDI and MASC since they are self-report measures. Discriminant validity was supported vis-à-vis weak, non-significant correlations with parent-rated externalizing symptoms.

Psychometric support was generally found for the C-FOCI Symptom Checklist in analyses comparing C-FOCI items with corresponding dimensions on the CY-BOCS Symptom Checklist. For the most part, correlations of moderate strength were identified between C-FOCI items and their corresponding CY-BOCS symptom dimension, providing convergent validity support. In addition, C-FOCI items that assess a particular domain were generally weakly related to CY-BOCS symptom dimensions that assess diverging constructs (e.g., contamination symptoms were generally unrelated to the aggressive/checking symptom dimension). In several instances, however, correlations were only moderate in strength and/or the C-FOCI items correlated significantly with other symptom dimensions. For example, the C-FOCI item assessing losing something valuable (considered a hoarding symptom) was only weakly related to the CY-BOCS hoarding dimension but strongly related to the symmetry/ordering dimension. The strong correlation with the symmetry/ordering dimension makes intuitive sense given that many youth engage in rituals of this type to address fears of misplacing something. Similarly, the C-FOCI sexual/religious/somatic obsession items were moderately related to the CY-BOCS aggressive/checking and sexual/religious symptom dimensions. It is likely that these findings are a function of overlapping item content and/or how symptoms often serve various functions (e.g., symmetry symptoms may serve to minimize the chance of losing something).

In addition to the psychometric results, data on the phenomenology and prevalence of various obsessions and compulsions in a clinical sample was gathered. Older youth reported greater symptom severity than did younger children; this may be a reflection of longer illness duration and thus, greater impairment; better insight among older youth which results in more accurate perceptions of symptom severity; or greater willingness to self-disclose symptoms relative to younger children. There were four symptoms that were endorsed by over 50% of the sample: (1) contamination concerns; (2) ritualized hand-washing, cleaning, or grooming; (3) symmetry and ordering compulsions; and (4) reassurance seeking and confessing (Table 1). This latter symptom was endorsed by over 63% of the sample, which highlights the important role of others, particularly caregivers, other family members, peers, and teachers, in the expression of pediatric OCD symptoms. Notably, providing reassurance is counter to the principles of evidence-based cognitive-behavioral treatment. Accordingly, family-based approaches would seem to have particular relevance in treating youth, particularly those for whom reassurance seeking and accommodation is clinically meaningful (e.g., [39, 40]). The least common symptom on the C-FOCI Symptom Checklist was the fear of spreading an illness, which is not unexpected, as children's symptoms tend to be more self-focused.

Study 2

Method

Participants

This volunteer community sample consisted of 191 participants (80 males) between the ages of 14 and 18 years ($M = 15.45$, SD = 1.25 years) who were recruited as part of a larger school screening for OCD and anxiety. Information regarding ethnicity was not collected for the non-clinical sample per the school policy; however, the ethnic distribution of the school was primarily Caucasian (85.2%), with 7.5% Asian, 6.1% Hispanic, and 1.3% African–American. While there was no significant gender difference in comparison to the OCD sample, this non-clinical sample was significantly older ($t = -8.05$, $p < .001$).

Procedures

Participants completed the C-FOCI and other self-report measures of anxiety and OCD via internet administration as part of a larger school screening. Youth were given the universal resource location (URL) that they could use to access the study measures. Surveymonkey.com was the website that housed the questionnaire battery. Surveymonkey is a secure server has been used successfully in previous adult (e.g., [41]) and pediatric (e.g., [42, 43]) studies to collect anonymous data on psychiatric conditions and symptoms across the developmental spectrum. Participants were allowed to complete the questionnaire battery at any computer that had Internet access.

Youth provided consent prior to completing the questionnaire battery. At the time of consent, they were informed that no personal identifying information would be collected except their age and the date and time of their computer submission. The secure website opened with a ''welcome" page that included directions, followed by the C-FOCI, MASC, and additional measures that were part of the larger screen, and ended with a ''thank you''/ debriefing page. Subjects could "exit" the battery at any time during administration.

Participants were reminded in the debriefing page that they could contact study personnel with questions. In developing Internet versions of the study questionnaires, we attempted to maintain relative equivalence to the paper-and-pencil versions, with the "page" layout, directions, and scales being held identical. No reminders to complete items were included to maintain equivalence with the paper-and-pencil version. Data collection procedures for the non-clinical population were approved by the University of Pennsylvania institutional review board.

Data Analyses

Frequency counts were computed for each of the C-FOCI Symptom Checklist items. The internal consistency of the C-FOCI Symptom Checklist and Severity Scale was assessed with the Kuder-Richardson-20 (KR-20) statistic for the Symptom Checklist and Cronbach's alpha [36] for the Severity Scale.

Results

Overall, internet administration proved successful with the majority of participants (172; 90.2%) completing the measure, and few missing items. Ninety-nine participants (51.8%) completed the questionnaire within 7 days of gaining access to the study URL. Four symptoms were endorsed by over 40% of the sample: (1) contamination concerns; (2) losing something valuable; (3) harm coming to a loved one; and (4) reassurance seeking and confessing (Table 1). Although the non-clinical sample, on average, reported a moderate number of symptoms ($M = 4.55$), scores on the Severity Scale were low ($M = 1.46$). Internal consistency was acceptable for the C-FOCI Severity Scale ($\alpha = .73$) and Symptom Checklist ($\alpha = .74$).

Discussion

Internet-based data collection offers several advantages over traditional paper-and-pencil measures, including decreased experimenter demand and social desirability effects [44, 45], savings of money and time [46], greater transportability/patient access, and possibly greater self-disclosure by participants [47]. Based on the potential benefits of internet administration, it is important to establish feasibility and acceptability for internet administration of OCD measures in youth.

The C-FOCI was completed among a community sample of adolescents via internet administration, demonstrating feasibility as a screening tool delivered via internet. The C-FOCI demonstrated excellent internal consistency in a non-clinical sample. The reliability and validity of internet administration remains to be established. Future evaluation of equivalence to paper-and-pencil administration and concurrent validity with other well-established self-report measures of OCD is needed.

Findings regarding prevalence of symptoms in the non-clinical sample indicated that more than two-thirds of the sample feared losing something valuable. Additionally, 52% reported a fear of harm coming to a loved one because the respondent was not careful enough. There are considerable data that indicate that people without OCD experience 'normal' obsessions that are comparable in content to those with OCD [48, 49]. Consistent with our findings, what distinguishes people with 'normal' obsessions from a person with OCD is the degree to which symptoms are frequent, distressing, intense, and provoke efforts to resist. Indeed, some have reported certain obsessions to be prevalent in non-clinical

populations [50, 51]. For example, Rassin et al. [51] noted that obsessions about themes of aggression, harm, sex, illness, death, and religion are reported frequently in non-clinical samples and are often challenging to discriminate from obsessions experienced by OCD patients. Our findings are consistent with this in that a number of obsessions and compulsions were endorsed by similar—and in some cases greater—percentages of non-clinical subjects relative to pediatric OCD patients. However, the OCD sample of Study 1 reported significantly greater severity on each Severity Scale item, which is consistent with Rachman and Da Silva's [49] findings. And, the majority of items were reported with greater frequency among youth with OCD, providing tentative support for the discriminant validity of the C-FOCI.

General Discussion

This study reports on the development and psychometric properties of the C-FOCI, a new scale assessing the presence and severity of obsessions and compulsions in youth with OCD. The C-FOCI is similar to other self-report measures in that it assesses the presence of obsessive–compulsive symptoms. Key features that distinguish the C-FOCI from other measures include similarity to the CY-BOCS Severity Scale, thereby facilitating comparisons between the measures, and the use of a unitary Severity Scale, corresponding with evidence that separate obsession and compulsion severity indices may not be the ideal way to conceptualize symptom severity [31, 52]. The present measure has the unique strength of assessing a range of common obsessions and compulsions as well as their overall severity on a unitary scale, similar in content to the CY-BOCS. In addition, the ease of administration, simple response format, feasibility of internet administration, and comprehensiveness of symptom assessment are notable characteristics of the C-FOCI that make it applicable for a variety of settings, such as a symptom screen measure in community samples. The C-FOCI requires no training in administration or scoring, and can be completed independently in $\sim$5–10 min. Together with the unitary Severity Scale, these qualities make the C-FOCI conducive to monitoring treatment progress among youth.

Overall, the psychometric properties of the C-FOCI were strong. The Symptom Checklist and Severity Scale both demonstrated good internal consistency. Support for the validity of the C-FOCI was found including (1) moderate correlations with clinician ratings of OCD symptom severity and child- and parent-reported OCD-related impairment; (2) treatment sensitivity; (3) weak relations with parent-rated externalizing behaviors; (4) generally good correspondence between C-FOCI Symptom Checklist items that measure a particular domain of OCD symptoms with the corresponding symptom dimension on the CY-BOCS Symptom Checklist; and (5) meaningful differences in symptom severity from non-clinical subjects.

Both reported studies have methodological shortcomings that should be considered when interpreting the results. First, the generalizability of our findings may be limited as the OCD sample was modest in size, largely Caucasian, and treatment-seeking. Second, the community sample did not receive a structured clinical interview and thus it is possible that a subset of these youth might have had diagnoses of OCD or other psychiatric disorders. Similarly, it would have been ideal to examine the C-FOCI in a non-OCD psychiatric sample. Finally, the C-FOCI contains 17 items assessing obsessions and compulsions that are commonly endorsed by youth with OCD. In no way do these items represent all OCD symptoms experienced and thus when implemented clinically, the C-FOCI may not identify some children whose OCD symptoms occur with less frequency.

Although the psychometric properties of the C-FOCI are promising, there are a number of areas that require further empirical attention. First, as test–retest reliability was not assessed in the study, it will be important to examine the stability of C-FOCI scores over short and longer durations. Second, it will be important to examine C-FOCI ratings in a non-OCD psychiatric sample given that such symptoms can often be seen in other pediatric psychiatric disorders (e.g., reassurance seeking in generalized anxiety disorder; ritualized behavior in psychosis). Finally, given that the C-FOCI was designed for use in both clinical and community settings, the psychometric properties should be examined in larger and younger non-clinical samples.

Summary

Overall, the C-FOCI is a new self-report measure with promising reliability and validity that is designed to assess both the presence and severity of obsessions and compulsions in youth. Through Study 1 and Study 2, respectively, C-FOCI evidenced sound reliability and validity, reactivity to treatment and feasibility of internet administration. The measure's validity as a screener has yet to be determined, via blind administration of both C-FOCI and CY-BOCS (the gold standard) to OCD patients and nonclinical controls. This avenue of research is of great clinical import, as the availability of a quick and convenient measure for clinical and community screenings could improve the identification of youth in need of intervention, as well as assist in monitoring treatment progress and outcome.

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