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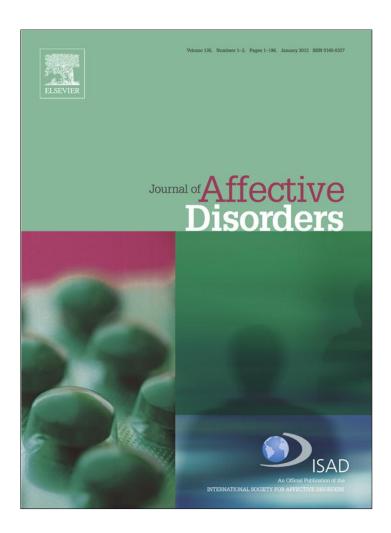Ayers, Catherine R
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Research Report

The UCLA Hoarding Severity Scale: Development and validation

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ABSTRACT

Background: Effective management of Hoarding Disorder (HD) must begin with assessment of the severity of hoarding symptoms and functional impairment. We sought to validate the UCLA Hoarding Severity Scale (UHSS), a semi-structured, clinician-administered rating scale that measures the severity of both the core symptoms of HD and the associated features of indecisiveness, perfectionism, task prolongation, and procrastination, which are significantly associated with the diagnosis and impairment of HD.
Methods: Hoarding symptom severity was measured in 62 patients who met DSM-5 diagnostic criteria for HD and 65 normal controls, using the UHSS and the Saving Inventory-Revised (SI-R), a well validated self-report measure of hoarding symptoms.
Results: The UHSS showed significant internal consistency (Cronbach's $\alpha = .70$). Principal components analysis revealed three factors that accounted for 58% of the variance: 1) associated features and functional impairment, 2) clutter volume and social impairment, and 3) difficulty discarding, urges to save, and excessive acquisition. UHSS and SI-R scores were significantly correlated. UHSS and SI-R total and factor scores of HD patients were all significantly different from those of controls.
Limitations: Inter-rater and test–retest reliability were not assessed. The initial version of the UHSS did not contain rater instructions, so it lacked quantifiable anchor points for ratings.
Conclusions: The UHSS showed internal consistency, construct validity, convergent validity, and known groups discriminant validity. The UHSS validly measures the core symptoms, associated features, and functional impairment of patients with HD. Utilizing a valid clinician-administered scale will provide a more comprehensive and accurate clinical assessment of patients with HD.

1. Introduction

Hoarding is defined as the acquisition of, and inability to discard, items even though they appear (to others) to have no value (Frost and Gross, 1993). Frost and Hartl (1996) developed the first systematic definition and diagnostic criteria for clinically significant compulsive hoarding: (a) the acquisition of and failure to discard a large number of possessions that appear (to others) to be useless or of limited value, (b) living or work spaces are sufficiently cluttered so as to preclude activities for which those spaces were designed, and (c) significant distress or impairment in functioning is caused by the hoarding behavior or clutter. Formal diagnostic criteria were developed for Hoarding Disorder (HD) (Mataix-Cols et al., 2010) and are now included in the Diagnostic and Statistical Manual of Mental Disorders, 5th ed. (DSM-5; American Psychiatric Association, 2013).

These diagnostic criteria have been found in a clinical field trial to have excellent sensitivity, specificity, inter-rater reliability, and validity (Mataix-Cols et al., 2013).

HD is driven by an exaggerated perceived need to keep and save items, often related to fears of losing items that the patient believes are valuable or may be needed later, or making the "wrong" decision about what to keep or discard (Saxena et al., 2002; Steketee and Frost, 2003). These fears cause considerable distress and lead to urges to save items. People with HD also frequently have excessive emotional attachments to possessions and distorted beliefs about the importance of possessions (Frost and Gross, 1993). Excessive acquisition behaviors, including acquisition of free items, excessive buying, and stealing, are quite common, found in 65–85% of all HD patients (Frost et al., 2009; Mueller et al., 2009; Timpano et al., 2011). The consequent clutter often causes significant social and occupational impairment (Frost et al., 2000; Saxena et al., 2002, 2011; Tolin et al., 2008b) and adverse effects on the family members of HD patients (Tolin et al., 2008a). In severe cases, it can produce health risks from infestations, falls, fires, and inability to cook or eat in the home (Steketee and Frost, 2003). Avoidance is prominent and

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includes behavioral avoidance of discarding or storing items, and cleaning, as well as cognitive avoidance of making decisions or even thinking about the clutter.

Hoarding and saving symptoms are part of a discrete clinical syndrome that includes the core symptoms of difficulty in discarding, urges to save, excessive acquisition, and clutter, as well as several associated features: indecisiveness (Samuels et al., 2008), perfectionism, procrastination, disorganization, and avoidance (Frost and Hartl, 1996). These associated features have been found to be uniquely and significantly associated with the categorical diagnosis of HD, as well as hoarding symptom severity and impairment – particularly social impairment (Timpano et al., 2011). In addition, many people with HD are quite slow in completing tasks, are frequently late for appointments, and show circumstantial, over-inclusive language. Patients with prominent hoarding and saving who show these other associated features are thus considered to have the "compulsive hoarding syndrome" (Saxena et al., 2002; Steketee and Frost, 2003).

In community-based population samples, clinically significant compulsive hoarding is common, with a population prevalence of 1.5–5.8% (Samuels et al., 2008; Iervolino et al., 2009; Mueller et al., 2009; Timpano et al., 2011; Nordsletten et al., 2013b). Initial onset of HD symptoms is usually around 12–13 years of age (Frost and Gross, 1993; Samuels et al., 2002; Grisham et al., 2006; Ayers et al., 2010; Tolin et al., 2010b). The course tends to be chronic and progressive, with severe levels of hoarding starting in the mid-thirties, and symptoms often worsening with age (Grisham et al., 2006; Ayers et al., 2010; Tolin et al., 2010b).

1.1. Assessment of Hoarding Disorder

Effective management of HD begins with a thorough neuropsychiatric evaluation to rule out physical disabilities, primary psychotic disorders, autism spectrum disorders, cognitive impairment or dementia, brain lesions, and other neurological disorders that could cause clutter or hoarding-like symptoms. Depressive disorders should also be ruled out as a primary cause of clutter, since apathy, fatigue, or hopelessness can lead to failure to clean, discard or organize possessions. Hoarding behavior and clutter caused by "typical" obsessions about harm, contamination, or order in obsessive–compulsive disorder (OCD) should also be excluded. Initial evaluation should include assessment of the core symptoms – perceived need to save possessions, difficulty discarding, excessive acquisition, and clutter, as well as the associated features – indecisiveness, perfectionism, procrastination, disorganization, and task prolongation. More specifically, clinicians should assess the amount of clutter, types of items saved, usability of living and work spaces, potential health and safety hazards, beliefs about possessions, information processing deficits, avoidance behaviors, insight, motivation for treatment, social and occupational functioning, and activities of daily living (Saxena and Maidment, 2004).

Specific rating scales have been developed to measure the severity of the component symptoms of HD quantitatively. These include several self-report questionnaires. The Saving Inventory-Revised (SI-R; Frost et al., 2004) is a well validated, 23-item self-report questionnaire with three factor analytically defined subscales – difficulty discarding, excessive clutter, and excessive acquisition. It shows good internal consistency and test–retest reliability, as well as known groups validity and concurrent and divergent validity, in clinical and non-clinical samples. The SI-R has been found to distinguish individuals with compulsive hoarding from non-hoarding populations. Its maximum score is 92, and a score of at least 40 has been used as a cutoff for inclusion in studies of HD. However, the SI-R does not assess any of the associated features of the compulsive hoarding syndrome.

The *Saving Cognitions Inventory* (SCI; Steketee et al., 2003) is a self-report measure that assesses hoarding-related beliefs; it is not intended to be a broader measure of HD symptom severity. Similarly, the self-report *Compulsive Acquisition Scale* (CAS; Frost et al., 2009) assesses only acquisition behaviors, and the *Activities of Daily Living in Hoarding Scale* (ADL-H; Frost et al., 2013) assesses only how much clutter interferes with one's routine daily activities. The *Clutter Image Rating* (CIR; Frost et al., 2008) assesses the amount of clutter in a person's home by having them select photographs that most closely match the volume of clutter in each room, but does not assess impact of clutter, hazards, or functional impairment. The *Hoarding Rating Scale-Self Report* (HRS-SR; Tolin et al., 2008b) is a brief, five question self-report tool that assesses most of the core symptoms of HD, distress, and impairment, but does not include perceived need to save items, reasons for the difficulty discarding, or the associated features.

There are several problems with self-report hoarding questionnaires. Many individuals with compulsive hoarding have poor insight into their condition and symptoms (Steketee and Frost, 2003; Pertusa et al., 2010; Neziroglu et al., 2012). People with HD tend to under-report their specific hoarding symptoms, while over-reporting their overall global impression of hoarding severity (Dimauro et al., 2013). Obtaining collateral information from others who have observed the patient's home or behaviors can often be very helpful. Thus, a clinician-administered assessment that does not solely rely on patient self-report but can incorporate other sources of information is crucial for accurate and valid assessment of hoarding symptoms and functional impairment. The existing self-report measures also do not contain objective or quantifiable anchor points for a patient's subjective ratings of "mild," "moderate," or "severe." Further, they do not allow for secondary questions, integration of other history, or clinical judgment to obtain a more accurate rating.

Standardized diagnostic interviews have also been developed for HD. The *Hoarding Rating Scale-Interview* (HRS-I; Tolin et al., 2010) is a five-item, semi-structured interview that assesses difficulty discarding, difficulty using rooms in the home due to clutter, excessive acquisition, emotional distress, and functional impairment. It shows high internal consistency and reliability across time, and can differentiate individuals with hoarding symptoms from non-clinical individuals. The maximum score on the HRS-I is 20, and the optimal cutoff score to differentiate compulsive hoarders from non-hoarders was found to be 14 (Tolin et al., 2010). Although useful, the HRS-I cannot be used to diagnose HD based on the DSM-5 criteria because it does not assess the specific reasons for hoarding and difficulty discarding (i.e., fear of losing something that might be valuable vs. physical disability and inability to remove heavy items from the home vs. fear of contamination vs. bizarre delusions, etc.), so it cannot determine whether patients meet DSM-5 Criteria A and B, which state that the persistent difficulty discarding personal possessions is "due to strong perceived need to save items, distress, and/or indecision associated with discarding". For the same reason, the HRS-I also cannot determine whether patients meet DSM-5 Criteria E or F, the major exclusion criteria that rule out other medical or neurological conditions or other mental disorders as causes of the hoarding symptoms. The HRS-I does not contain objective or quantifiable anchor points for subjective ratings of "mild," "moderate," "severe," etc., except for acquisition. In addition, the HRS-I does not assess the important associated features of indecisiveness, perfectionism, or procrastination. More recently, the *Structured Interview for Hoarding Disorder* (SIHD; Nordsletten et al., 2013a) was developed to determine whether patients meet DSM-5 diagnostic criteria for HD. However, the SIHD does not measure or quantify symptom severity or associated features of HD.

The UCLA Hoarding Severity Scale (UHSS; Saxena et al., 2007) was first developed by two of the authors (SS and KMM) in 2003, before the SI-R was published or other scales were available. The UHSS was developed out of the need to accurately characterize hoarding symptoms in patients who presented for treatment at an intensive outpatient setting, as well as in research studies. Over a period of several months, a multidisciplinary team of clinicians defined the symptoms of compulsive hoarding that they observed, as well as associated features or characteristics that were typically present in patients with primary compulsive hoarding. These phenomenological observations were combined with the available literature on the clinical presentation and symptomatology of compulsive hoarding, to formulate the UHSS. The initial goal was to create a user-friendly, clinician-administered rating scale to be used in conjunction with a clinical interview (as well as information from collateral sources), that would help bypass the problems inherent in self-report measures – poor insight and either minimization or exaggeration of symptoms by patients in their self-reports – by allowing the clinician to make a determination of symptom severity without having to rely solely on self-reports. A further goal was to include and quantify the severity of the associated features that were not included on the SI-R, given that these symptoms are closely related to HD symptoms and strongly influence functional impairment in HD patients (Timpano et al., 2011).

The UHSS is a 10-item, clinician-administered scale that assesses the presence and severity of clutter, embarrassment due to clutter, urges to save items, excessive acquisition, difficulty discarding, social and occupational impairment, slowing, perfectionism, indecisiveness, and procrastination. Scores reflect the average occurrence of each symptom over the one-week prior to and including the time of the interview. Its maximum score is 40. The UHSS is a semi-structured interview that allows the clinician to ask additional questions for clarification, which helps improve accuracy when assessing patients who may be prone to confusion regarding the meaning of specific questions and ratings. Thus, scores are based on the patient's report but may also include information obtained from family members or others, and the final ratings depend on the clinical judgment of the interviewer, which is especially important when assessing patients with poor insight. The UHSS has previously been found to differentiate patients with primary compulsive hoarding from patients with OCD who have "typical" OCD symptom domains as their predominant problems, even if they also have some hoarding/saving symptoms, and has also been shown to detect clinically significant changes in hoarding symptom severity with treatment – both pharmacotherapy (Saxena et al., 2007; Saxena and Sumner, 2014) and cognitive behavioral therapy (Ayers et al., 2014b).

In the present study, we sought to obtain preliminary validation data on the UHSS in both clinical samples of patients meeting DSM-5 criteria for HD and non-clinical samples of age- and gender-matched normal controls, in order to test the internal consistency, construct validity, convergent validity, and known groups discriminant validity of the UHSS. Understanding the psychometric properties of the initial version of the UHSS will allow for the development of more reliable and valid revisions of this clinician-administered measure in the future.

2. Methods

The research was approved by the Institutional Review Boards administered by the Human Research Protections Programs of the University of California, San Diego and the University of California, Los Angeles. Written informed consent was obtained from all the participants prior to enrollment.

2.1. Participants

Subjects included 62 patients who met DSM-5 diagnostic criteria for HD and 65 control participants without any psychiatric diagnoses. The mean age of HD participants was 57 ± 12.3 years, and 50 ± 8.4 years for controls. The sample was composed of HD patients and normal controls enrolled in four separate study protocols that were conducted over several years, then pooled for this analysis. Of the 62 HD participants, 21 participants were originally enrolled in neuroimaging and treatment studies at UCLA (Saxena et al., 2007), 16 were enrolled in neuroimaging and treatment studies at UCSD (Saxena and Sumner, 2014), 13 were enrolled in a study examining late life HD at VA San Diego Healthcare System (VASDHS) and UCSD (Ayers et al., 2010), and 12 were from a VASDHS/UCSD study of treatment for geriatric HD (Ayers et al., 2011). Clinical and treatment response data from these various studies has been published previously (Saxena et al., 2007; Ayers et al., 2010, 2011; Saxena and Sumner, 2014). Psychiatric comorbidities of the HD sample were available for the three VASDHS and UCSD samples ($n=41$) and included major depressive disorder (29%), obsessive–compulsive disorder (17%), generalized anxiety disorder (7%), post-traumatic stress disorder (7%), attention deficit hyperactivity disorder (ADHD; 5%), social anxiety disorder (5%), and cannabis abuse (2%). The majority of participants were Caucasian in both the HD sample (73%) and in the normal control sample (84%). Of the controls, 40 were age- and gender-matched normal controls from the UCLA and UCSD neuroimaging studies, and 25 were age-matched controls from the VASDHS/UCSD late-life hoarding studies.

All participants were assessed by a clinical interview administered by a licensed psychiatrist, clinical psychologist, or advanced level graduate student. For the VASDHS and UCSD studies, participants were administered the MINI International Neuropsychiatric Interview (MINI; Sheehan et al., 1998). Patients with psychotic disorders, bipolar disorder, substance dependence, panic disorder, eating disorders, dementia, or mental retardation were excluded. All younger and midlife HD participants from neuroimaging studies ($n=37$) were free of psychotropic medication and any other medication that could affect brain function for at least six weeks. Late life HD participants ($n=25$) were required to remain on stable doses of any psychiatric medications, with no changes for at least three months prior to the baseline assessment.

2.2. Measures

Hoarding symptom severity was measured in each participant with both the SI-R and UHSS during the baseline assessment. In order to be included, HD participants had to score > 40 on the SI-R and > 17 on the UHSS. The SI-R cutoff was based on the results of prior studies that constructed receiver operating characteristic (ROC) curves to distinguish patients with HD from controls and other diagnostic groups with maximal sensitivity and specificity (Tolin et al., 2010; Frost and Hristova, 2011).

2.3. Data analysis

Descriptive statistics were obtained for variables, and data were examined for missing values and outliers. There was no missing UHSS data among the entire sample. Pairwise deletion was used for missing SI-R data. After examining normality of continuous measures and homogeneity of variance, no significant variation from the normal distribution was found. The internal consistency of the scale was assessed with Cronbach's α. To determine the factor structure and construct validity of the UHSS, principal components factor analysis was conducted on UHSS data from HD participants using varimax rotation. Given that this was the

first analysis of the UHSS, we conducted the factor analyses in an exploratory rather than confirmatory fashion. The correlational nature between the variables in the UHSS was heretofore unknown, so an orthogonal rotation was selected. To determine convergent validity, total summed UHSS scores and newly created factor scores were correlated with SI-R total and factor scores, and with demographic variables. To establish known groups discriminant validity, UHSS scores were compared between HD patients and normal controls with one-way analysis of variance. All the tests were two-tailed; significance was defined as $p < .05$. Analyses were performed using SPSS version 16.0.

3. Results

The internal consistency of the 10-item scale was good (Cronbach's $\alpha = .70$). Inter-item correlations ranged from .66 to .76 ($p < .05$), indicating construct validity. Within the HD sample ($n = 62$), principal component factor analysis of all the UHSS items revealed three factors that accounted for 58% of the variance (Table 1). The first factor (28% of variance) included items assessing the impact of HD symptoms on work and functioning (item 7), indecisiveness (item 9), perfectionism and task prolongation (item 8), and procrastination (item 10). The second factor (17% of variance) included clutter volume (item 1), embarrassment (item 2), and impact on social relationships (item 6). The third factor (13% of variance) included strength of urges to keep items most people would discard (item 4), anxiety related to discarding (item 5), and excessive acquisition (item 3). Deletion of any item did not improve reliability; therefore, all items were retained.

Within the HD sample, UHSS total scores were significantly correlated with SI-R total scores ($r = .585$, $p < .001$; Table 2), which established convergent validity but also showed that the two scales were not measuring identical symptoms. With respect to factors, the UHSS first factor (associated features and functional impairment) was correlated with the SI-R clutter factor ($r = .492$, $p < .001$), SI-R saving factor ($r = .323$, $p = .025$), and SI-R acquisition factor ($r = .374$, $p = .009$). The UHSS second factor (clutter volume and social impairment) was also significantly correlated with all three SI-R factors (SI-R clutter: $r = .359$, $p = .012$; SI-R saving: $r = .446$, $p = .001$; SI-R acquisition: $r = .437$, $p = .002$). The UHSS third factor (core hoarding symptoms and acquisition) was also significantly correlated with SI-R clutter ($r = .557$, $p < .001$), SI-R acquisition ($r = .616$, $p < .001$), and SI-R saving ($r = .333$, $p = .021$) factors.

As expected, significant differences were found on the UHSS between the HD and control groups (Table 3), establishing known groups discriminant validity. ANOVA revealed significant differences between groups for the UHSS total score ($F = 1141.34$,

$p < .001$), UHSS associated features and functional impairment (first) factor ($F = 619.51$, $p < .001$), UHSS clutter and social impairment (second) factor ($F = 656.17$, $p < .001$), and UHSS core hoarding symptoms and acquisition (third) factor ($F = 455.56$, $p < .001$). Significant differences between controls and HD participants were also found for SI-R scores ($F = 636.99$, $p < .001$).

4. Discussion

To our knowledge, this study is the first to provide preliminary psychometric data on a clinician-administered measure of HD symptom severity and associated features of HD. The UHSS displayed good internal consistency, suggesting that the 10 items are strongly interrelated and part of the same overall construct. The UHSS showed strong convergent validity, measuring the same symptoms as the SI-R, plus the associated features. The UHSS also demonstrated significant known groups discriminant validity, distinguishing HD patients from normal controls.

Principal components factor analysis of the UHSS revealed three factors that accounted for 58% of the variance: a) associated features and functional impairment, b) clutter and social impairment, and c) core hoarding symptoms – difficulty discarding, urges to save, and excessive acquisition. These factors are similar, but not identical to those of the SI-R (clutter, difficulty discarding, and excessive acquisition). We did not expect the two scales to be perfectly correlated, because they have substantial differences between them. Approximately one-third of the questions on the SI-R are about excessive acquisition, whereas the UHSS contains only one question about acquisition. However, the co-loading of excessive acquisition, urges to save, and difficulty discarding on the same factor is consistent with a recent finding that these symptoms co-occurred strongly enough to be considered a one-dimensional construct, suggesting that they are better conceived of as a cohesive hoarding phenotype (Meyer et al., 2013). The loading of clutter and social impairment onto the same factor is also consistent with prior evidence that clutter causes substantial social and family difficulties for people with compulsive hoarding problems, prevents them from inviting others to their home (Steketee and Frost, 2003), and creates strain and distress for their family members and friends (Tolin et al., 2008a).

Another important difference between the UHSS and the SI-R is the inclusion of three associated features on the UHSS that are not assessed by the SI-R: procrastination, indecisiveness, and task prolongation due to perfectionism. These three items were previously found to be uniquely and significantly associated with the categorical diagnosis of HD, as well as hoarding symptom severity, and were the strongest predictors of impairment in a large epidemiological study of HD (Timpano et al., 2011). Thus, the fact that the associated features and functional impairment loaded onto the same component factor is consistent with prior findings and adds to evidence that the associated features are both closely linked with other hoarding symptoms and strongly related to functional impairment in patients with HD. As such, it is vital that these features be assessed in patients with HD and addressed in treatment.

4.1. Limitations

This study had several limitations. The inter-rater and test–retest reliability of the UHSS were not assessed in this sample. However, our prior studies have shown that administration of the UHSS to HD patients before and after standardized treatment detects and quantifies clinically significant changes in hoarding symptom severity with treatment – both pharmacotherapy (Saxena et al., 2007; Saxena and Sumner, 2014) and cognitive behavioral therapy (Ayers et al., 2014a). The initial version of the

Table 1
UHSS factor analysis.

Factor loadings			
UHSS items	**1**	**2**	**3**
1. Extent of home affected by clutter	–	.81	–
2. Embarrassment if others see clutter	–	.85	–
3. Excessive acquisition	–	–	.57
4. Urges to keep items others would discard	–	–	.84
5. Anxiety if required to discard	–	–	.72
6. Effect on personal relationships	–	.69	–
7. Effect on work and daily functioning	.71	–	–
8. Tasks take longer/perfectionism	.67	–	–
9. Indecisiveness	.7	–	–
10. Procrastination	.63	–	–

Factor loadings derived from principal components analysis with varimax rotation.

Table 2
Correlations between UHSS and SI-R total and factor scores.

		UHSS				SI-R			
		Total	Clutter/social impairment	Core hoarding symptoms	Associated features/ functioning	Total	Clutter	Saving	Acquisition
Age		.12	−.01	−.03	.26*	−.28	−.19	−.18	−.08
UHSS	Total	–	.66***	.68***	.76***	.59***	.68***	.51**	.66***
	Clutter/social impairment	–	–	.14	.24	.41**	.36*	.45**	.44**
	Core hoarding symptoms	–	–	–	.35**	.51**	.56***	.33*	.62***
	Associated features/ functioning	–	–	–	–	.35*	.49***	.32*	.37**
SI-R	Total	–	–	–	–	–	.92***	.86***	.89***
	Clutter	–	–	–	–	–	–	.70***	.81***
	Saving	–	–	–	–	–	–	–	.74***
	Acquisition								

UHSS: UCLA Hoarding Severity Scale.
SI-R: Saving Inventory-Revised.

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

Table 3
UHSS and SI-R total and factor scores – means and standard deviations.

		HD ($n=65$)	Control ($n=62$)	F	p
Age		57.39 (12.31)	49.88 (8.39)	11.45	.001
UHSS	Total score	25.47 (4.77)	2.32 (2.72)	1141.34	< .001
	Clutter/social impairment factor	8.34 (2.37)	.3846 (.72)	656.17	< .001
	Core hoarding symptoms factor	7.53 (2.08)	1.05 (1.27)	455.56	< .001
	Associated features/functioning factor	9.63 (2.40)	.89 (1.47)	619.51	< .001
SI-R	Total score	61.98 (13.44)	8.33 (6.85)	636.99	< .001
	Clutter factor	21.46 (5.41)	3.78 (2.67)	782.28	< .001
	Saving factor	18.71 (3.70)	2.12 (2.21)	331.48	< .001
	Acquisition factor	17.71 (4.22)	2.08 (2.17)	193.00	< .001

UHSS: UCLA Hoarding Severity Scale.
SI-R: Saving Inventory-Revised.

UHSS did not contain manualized instructions for raters, so it lacked objective anchor points for choosing specific ratings on many of its questions. The sample was composed of participants enrolled in four separate study protocols that were conducted over several years, then pooled for this analysis. Another important limitation was that home visits to assess clutter volume or hazards in the patients' living spaces were not performed in conjunction with the UHSS or SI-R for all participants, so in-home ratings were not used for the present analysis.

However, this study also had several strengths. All HD patients were carefully evaluated by experienced clinicians, comorbid psychiatric disorders were rigorously diagnosed with structured diagnostic instruments, and participants with sub-threshold or subclinical hoarding were excluded. Further, healthy controls were age- and gender-matched with HD patients. In addition, potential confounds from treatment effects were minimized, as all HD patients were assessed prior to starting treatment (either CBT or medication), most patients were not on any psychotropic medications, and the few who were had no changes in medications or doses for at least 12 weeks prior to symptom assessment. The HD patient sample was clinically and demographically similar to HD patients in many prior studies. HD participants had moderate to severe hoarding symptoms, with mean UHSS (25.5 ± 4.8) and SI-R (62.0 ± 13.4) scores very similar to those of multiple previous samples of compulsive hoarding participants in assessment and treatment studies by other investigators (Frost and Hristova, 2011; Frost et al., 2012; Gilliam et al., 2011; Muroff et al., 2009, 2012; Steketee et al., 2010; Tolin et al., 2007).

The average age (57 ± 12.3 years) and gender distribution (88% women) of the sample of participants were also very similar to those of previous studies of compulsive hoarding patients.

Moreover, this study included HD patients with several comorbid disorders – MDD, OCD, GAD, ADHD, and social anxiety disorder – found to be the most commonly comorbid in HD patients (Frost et al., 2011), bolstering its generalizability. Unfortunately, the sample size limited statistical power to examine subgroups (e.g., midlife vs. geriatric HD) or the effect of comorbidities on HD symptom severity or impairment.

4.2. Conclusions

In conclusion, the results of this study suggest that the UHSS is a valid, clinician-administered scale that accurately measures the core symptoms, associated features, and functional impairment of HD patients. Utilizing a valid clinician-administered scale in addition to self-report measures will help overcome the limitations of poor insight, subjectivity, confusion, inaccuracy, minimization and exaggeration of symptoms commonly seen in HD, and will provide a broader and more comprehensive clinical assessment of patients with HD. Further, the addition of a scale that utilizes clinical judgment is important during a course of treatment, as it can help guide and refine the treatment plan.

Results from this investigation have led to the development of a revised version of the UHSS (UHSS-II) that now captures the DSM-5 core symptoms of HD, as well as its associated features and functional impairment. The UHSS-II contains a structured interview

guide for clinician raters and includes additional questions about hoarding symptoms that have been rephrased to fit the wording of the DSM-5 diagnostic criteria. Further, we have expanded the assessment of associated features and functional impairment. Importantly, the UHSS-II also now includes objective, quantifiable anchor points for ratings, which should significantly improve its accuracy and reliability. Validation of the UHSS-II is currently underway. Now that HD is a DSM-5 diagnosis, it is critical that we have tools that accurately, reliably, and validly quantify its core symptoms, associated features, and functional impairment.

Conflicts of interest

None.

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