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Hoarding severity predicts functional disability in late-life hoarding disorder patients

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Abstract

Objective—Late-life hoarding is a serious psychiatric condition with significant implications in health and functioning. Geriatric hoarding patients show greater impairment in activities of daily living and have a greater number of medical conditions compared with same-aged nonhoarders. This study examined the relationship between geriatric hoarding severity and functional disability severity.

Methods—Sixty-five subjects age 60 or older with hoarding disorder (HD) participated in the current study. Participants were assessed with measures of hoarding severity, psychiatric symptoms, and general disability. Hierarchical regression was used to test the unique association of hoarding symptoms with functional disability beyond the effects of demographic factors, anxiety, and depression.

Results—When controlling for demographics (age and gender) and psychiatric symptoms (anxiety and depression), hoarding severity predicts functional disability severity. Analyses also show that clinician-administered measures of hoarding are stronger predictors of disability than patient self-report measures.

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Conflict of interest None declared.

¹Twenty-eight of the participants were included in the sample in Ayers *et al.* (2012). This paper examined HD symptoms with the ADL-H, which examines typical ADLs impacted by hoarding such as ability to move/exit quickly, use sinks, appliances, plumbing, and standard use of rooms. This scale differs from traditional functional measures as it inquires about activities that are directly affected by clutter, rather than physical and cognitive abilities.

Conclusions—When treating older adults with HD, clinicians must consider symptom impact on daily life. A multidisciplinary team must be utilized to address the wide-ranging consequences of hoarding symptoms. Future work should examine how psychiatric treatment of HD affects functional disability.

Keywords

geriatric; older adults; compulsive hoarding; functional impairment; disability

Introduction

Hoarding disorder (HD) is a newly established psychiatric condition in the Diagnostic and Statistical Manual of Mental Disorders, Volume 5 (DSM-5; American Psychiatric Association, 2013). Formerly known as compulsive hoarding, HD was previously considered a subtype of obsessive-compulsive disorder (OCD; Calamari *et al.*, 1999; Calamari *et al.*, 2004) and was included as one of eight criteria for obsessive-compulsive personality disorder. HD is now considered an independent syndrome characterized by an inability to discard possessions regardless of the objects' values due to a desire to keep the items as well as to avoid the distress associated with the act of discarding. This prevents the active use of living spaces because of excessive clutter and causes clinically significant distress and/or functional impairment (American Psychiatric Association, 2013).

Epidemiological research suggests that the prevalence of clinically significant hoarding is approximately 5.3% in the general population (Samuels *et al.*, 2008). However, prevalence rates may be greater among older adults (Samuels *et al.*, 2008) and those with comorbid medical conditions (Marx and Cohen-Mansfield, 2003). HD is considered a chronic condition with symptoms that may worsen over time (Ayers *et al.*, 2010), although other studies have not found this age association (Mueller *et al.*, 2009; Fullana *et al.*, 2010). Regardless, HD is associated with medical problems and activity of daily living impairment due to living in a cluttered home (Ayers *et al.*, 2012; Ayers *et al.*, 2013).

Negative consequences associated with HD are seen across the lifespan. Approximately 63% of HD patients in a large-scale study reported at least one chronic and severe medical problem (Tolin *et al.*, 2008). Those with hoarding symptoms were also more likely to be obese or overweight and reported an increased risk of chronic and severe medical conditions than comparison groups. Older adults with hoarding commonly struggle to perform basic activities of daily living (ADLs) and self-care (Kim *et al.*, 2001; Ayers *et al.*, 2012). For example, the level of hoarding severity was found to be associated with impairment within the home in a study examining the functional disability of geriatric hoarders (Ayers *et al.*, 2012). Among the older adult hoarding sample, participants reported at least moderate difficulties with finding important items, moving around the inside of the house, eating at the table, utilizing the kitchen sink, preparing food, and sleeping in their bed (Ayers *et al.*, 2012).

Another study compared adults with HD with individuals with OCD on objective and subjective reports of quality of life and level of global functioning (Saxena *et al.*, 2011). Results indicated low overall quality of life across multiple domains in HD patients. In

particular, individuals with HD were less satisfied with their general safety and more likely to be victims of crime than their OCD counterparts. Lastly, midlife HD patients also miss an average of seven work days a month because of their illness (Tolin *et al.*, 2008). Provided that individuals with HD experience disability across several aspects of their daily life, it is not surprising that quality of life is often reduced.

Examinations of late-life HD have found an increased risk for medical conditions. One study describing the clinical features of older adults with HD reported commonly diagnosed medical comorbidities among their sample, yet they lacked a same-age comparison group. These included hypertension (61%), head injury (39%), and arthritis (28%; Ayers *et al.*, 2010). Another examination of the health status of older adults with HD revealed significantly higher rates of diabetes, head injuries, and hematological and lung conditions compared with age-matched and gender-matched nonclinical peers (Ayers *et al.*, 2013), with 90% reporting at least one medical condition. Medical conditions examined in that study included hypertension (61%), sleep apnea (22%), and seizures (11%). Additional research has suggested that older adults with HD may be more vulnerable to malnutrition and exacerbations of medical conditions as a result of medication mismanagement and poor dietary monitoring (Steketee *et al.*, 2012), low rates of healthcare utilization (Ayers *et al.*, 2013), and compromised sanitary conditions (Kim *et al.*, 2001).

Given the chronicity and functional limitations associated with HD, older adults with HD may be more vulnerable to the consequences of hoarding. Previous studies have focused simply on the rates of occurrence of impairment. This study examines the relationship between geriatric hoarding severity and disability in terms of frequency of essential task performance, functional limitations, and real-world consequences.

Methods

Subjects

Older adults with HD were recruited from San Diego County, California, through community flyers, physician outreach efforts, and electronic advertisements between July 2008 and July 2013. HD, for the purposes of this study, was defined as a Savings Inventory—Revised (SI-R; Frost *et al.*, 2004) score of greater than 40, an UCLA Hoarding Severity Score (UHSS; Saxena *et al.*, 2007) score of greater than 20, and/or a diagnosis of HD agreed upon by two licensed clinical psychologists following DSM-5 criteria. Qualifying patients and their data were culled from several different treatment studies. Exclusion criteria for these studies included starting and/or discontinuing psychiatric medications within 3 months of the initial assessment, a diagnosis of schizophrenia and/or bipolar disorder, and/or expressed suicidal ideation. Patients were also excluded if they scored less than 25 on the Montreal Cognitive Assessment (Nasreddine *et al.*, 2005), a brief neuropsychiatric measure of cognitive functioning.

In all, 65 subjects of at least 60 years old were included.¹ The pieces of demographic information describing this sample, including age, gender, race, education, marital status, and employment status, are included in Table 1.

Measures

All participants were consented to study procedures approved by an institutional review board and assessed with the measures described later by a licensed clinical psychologist or an advanced-level graduate student under the supervision of a licensed clinical psychologist.

Hoarding severity—Subjects were evaluated using the SI-R, a 23-item self-report measure that quantifies hoarding severity. Participants respond on a Likert-type scale ranging from 0 (*none, not at all, or never*) to 4 (*almost all/complete, extreme*). The SI-R has three subscales focusing on clutter, acquisition, and difficulty discarding. Subjects were also evaluated using the UHSS, a 10-item, clinician-administered measure that quantifies the severity of hoarding symptoms. Participants respond on a Likert-type scale ranging from 0 (*not at all*) to 4 (*extreme*). The UHSS focuses on indecisiveness, procrastination, and impairment in hoarding patients. In both measures, higher scores indicate greater severity. These measures are widely used in the field. Within the current sample, internal reliability was good (UHSS: $\alpha = 0.81$; SI-R: $\alpha = 0.91$).

Disability—Subjects were evaluated using the Late-Life Function and Disability Instrument (LLFDI; Jette *et al.*, 2002), a clinician-administered measure that examines both function (ability to perform discrete actions or abilities as part of daily routines) and disability (socially defined life tasks). Only the disability component was evaluated in the current study. The disability subscale of the LLFDI has two basic stems, “How often do you ...” (frequency) and “To what extent do you feel limited in ...” (limitation), followed by an activity (e.g., “manage household finances”). Participants respond on two Likert-type scales ranging from 1 (*never*) to 5 (*very often*) and 1 (*completely*) to 5 (*not at all*) for the frequency and limitation items, respectively. Raw scores are converted to a scaled score of 0–100 using the scoring instrument (Jette *et al.*, 2002). For the two dimensions, lower scores indicate fewer activities performed and increased limitations. Internal reliability was good for both the frequency dimension and the limitation dimension of the disability component ($\alpha = 0.82$ and 0.88, respectively).

Psychiatric symptoms—Subjects were evaluated using the Hospital Anxiety and Depression Scale (HADS; Zigmond and Snaith, 1983), a 14-item, self-report measure that detects depression and anxiety in patients. Seven items measure depression, and seven items measure anxiety. Participants respond on a Likert-type scale ranging from 0 (*no, not at all*) to 3 (*yes definitely*). Two items on the depression scale are reverse scored; no items on the anxiety scale are reverse scored. Higher scores reflect more anxiety and/or depression. Because symptoms with psychological, rather than physical, causes are tested, the HADS is considered to be unbiased by coexisting medical conditions (Snaith, 1987). Within the current sample, internal reliability for the anxiety and depression subscales was adequate ($\alpha = 0.80$ and 0.82, respectively).

Statistical analysis

All analyses were performed using the IBM SPSS Statistics program, version 18.0 (IBM Corporation, Armonk, NY). Means and standard deviations of the measures are reported in Table 1. Correlations between the different measures and their scores are presented in Table

2. Hierarchical regression was used to test the association between hoarding severity and disability. Four models were tested; two models examined the relationship between hoarding severity (i.e., UHSS and SI-R) and limitation in performing actions (Table 3), and two other models examined the relationship between hoarding severity and frequency of said actions (Table 4). For all models, step 1 of the regression controlled for age and gender, and step 2 controlled for anxiety and depression, as both anxiety and depression have been shown to be associated with disability (Porensky *et al.*, 2009; da Silva *et al.*, 2013). Hoarding severity variables (i.e., UHSS and SI-R) were entered in step 3.

Results

On average, the sample was mildly anxious and depressed, with HADS scores of 9.60 (4.08) and 8.01 (3.85), respectively (scores of 8–10 indicate mild cases; Zigmond & Snaith, 1994). Subjects demonstrated moderate disability with scores of 58.46 (6.33) in the frequency component and 58.43 (8.04) in the limitation component (Jette *et al.*, 2002). Lastly, patients had significant HD symptoms according to the UHSS (>20; 27.65 (6.06)) and the SI-R (>40; 57.53 (13.24)).

Anxiety and depression were positively correlated ($r = 0.52, p < 0.01$). Similarly, the two hoarding severity scales positively correlated with each other ($r = 0.76, p < 0.01$), as were the two disability dimensions of the LLFDI ($r = 0.38, p < 0.01$). Anxiety was positively correlated with both hoarding measures (UHSS: $r = 0.50, p < 0.01$; SI-R: $r = 0.35, p < 0.01$). Similarly, depression was correlated with the hoarding measures (UHSS: $r = 0.30, p < 0.05$; SI-R: $r = 0.50, p < 0.01$).

The limitation dimension was significantly and negatively correlated with both the psychiatric symptom scales (anxiety: $r = -0.49, p < 0.01$; depression: $r = -0.25, p < 0.05$) and the hoarding severity scales (UHSS: $r = -0.46, p < 0.01$; SI-R: $r = -0.34, p < 0.01$). The frequency dimension was significantly and negatively correlated with anxiety ($r = -0.52, p < 0.01$) and the UHSS ($r = -0.35, p < 0.01$), but did not significantly correlate with depression ($r = -0.15$) or the SI-R ($r = -0.22, n.s.$).

Finally, hierarchical regressions were performed to investigate the association between hoarding severity and disability, controlling for demographic factors and psychiatric symptoms. Table 3 examines the UHSS (Model 1) and SI-R (Model 2) as predictors of the frequency dimension of the LLFDI. In the first step of Models 1 and 2, age and gender were entered in the regression and neither significantly predicted frequency ($\beta = 0.08$ and $\beta = 0.13$, respectively). However, the addition of the psychiatric symptoms in the second step for both models resulted in a significant increase in variance explained ($R^2 = 0.32; F(2, 61) = 14.96; p < 0.05$). In Model 1, the UHSS significantly explained an additional 4.2% of the variance in frequency ($F(1, 60) = 4.17; p < 0.05$). And when SI-R was entered in step 3 of Model 2, it predicted an additional 4.1% of variance in the frequency dimension ($F(1, 60) = 4.00; p < 0.05$).

Table 4 examines the UHSS (Model 3) and the SI-R (Model 4) as a predictor of the limitation dimension of the LLFDI. Gender and age did not predict a significant amount of

variance in the first step of Model 3 and Model 4 ($F(2, 61) = 0.14; n.s.$). In step 2 for both models, psychiatric symptoms explained a significant proportion of the variance in limitations ($R^2 = 0.23; F(2, 61) = 9.19; p < 0.05$). In step 3 of Model 3, the UHSS significantly explained an additional 7.5% of the variance ($F(1, 60) = 6.56; p < 0.05$). In step 3 of Model 4, the SI-R significantly explained an additional 5.8% of the variance ($F(1, 60) = 4.88; p < 0.05$).

Discussion

Results indicate that HD is related to an increased level of functional and instrumental disability. These associations remain significant when controlling for basic demographics, anxiety, and depression. The LLFDI measures a number of basic functional activities, which include personal health care, household management, meal preparation, and keeping in touch with family and friends. Our results demonstrate that a diagnosis of HD in late life is likely to be associated with difficulties in performing these functional tasks. These findings have important clinical implications for approaches to HD treatment, such that providers must consider the impact of hoarding on multiple dimensions of daily life.

The analyses show that the clinician-administered measure of hoarding (i.e., the UHSS) appears to be a slightly stronger predictor of disability than the patient self-report measure (i.e., the SI-R). The UHSS uniquely accounted for more variance (Models 1 and 3) than the SI-R (Models 2 and 4). This may indicate that clinicians assessing for hoarding severity may provide greater objectivity. Further, whereas no significant bivariate correlation was found between the SI-R and frequency component of the LLFDI, the UHSS significantly correlated with both components.

There are several limitations to this study. Only 15.4% of our sample was representative of ethnic minorities despite the diverse population within the greater San Diego area. As such, efforts should be made to normalize the racial distribution of the population studied. Socioeconomic status and concomitant access to health care should be accounted for as well, because these factors may impact the severity of disability measured by the LLFDI. Medical illnesses may have impacted disability, yet these conditions were not formally assessed in the current investigation. Finally, disabilities would more be accurately measured if the existence and extent of the functional impairment was directly substantiated by medical staff, rather than self-reported.

Future work should examine the predictive ability of hoarding measures in relation to other available disability measures, as well as compare and contrast these findings to a sample of nongeriatric HD participants. As treatment modalities for HD are further studied and refined, outcomes should not focus solely on the resolution and/or improvement of hoarding symptoms but should also include functional outcomes. Whereas previous studies have demonstrated that increased hoarding symptoms are associated with problems with ADLs within the cluttered home (Ayers *et al.*, 2012), future studies should examine whether ADL impairment within the home acts as a mediator between HD symptoms and general functioning impairments within individuals with HD. Lastly, the effects of preexisting

medical conditions on disability should also be investigated in patients with HD, as they may also be contributing to an already complicated clinical picture in older adults.

As the average age of the American population as well as the awareness of HD continues to increase, clinicians of all types may see a rise in the number of late-life HD cases reported and diagnosed. In addition to psychiatric treatment, the inclusion of a multidisciplinary team is necessary to evaluate and address potential social, occupational, and functional disabilities. Referrals to physical therapists, occupational therapists, medical specialists, and social workers rise to even greater importance, given the impact that HD has on disability status.

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Key points

- In older adults with HD, hoarding severity uniquely predicts functional disability.
- A clinician-administered measure of HD may be a better predictor than patient self-report measures.
- Multidisciplinary teams are needed to address the wide-ranging impairment associated with HD.

Table 1

Sample characteristics of 65 older adults with hoarding disorder

Characteristic	M (SD) or N (%)
Age (years)	66.08 (6.15)
Gender	
Female	45 (69.2%)
Male	20 (30.8%)
Race	
Asian/Pacific Islander	3 (4.62%)
Caucasian	55 (84.62%)
Hispanic/Latino	3 (4.62%)
Multiracial	4 (6.15%)
Education (years)	15.78 (2.20)
Employment status	
Disabled	12 (18.46%)
Full-time	12 (18.46%)
Part-time	9 (13.85%)
Retired	28 (43.08%)
Unemployed	4 (6.15%)
Marital status	
Divorced/widowed	24 (36.92%)
Married/remarried	17 (26.15%)
Separated	1 (1.54%)
Single/never married	23 (35.38%)
SI-R	57.53 (13.24)
UHSS	27.65 (6.06)
LLFDI	
Frequency (scaled score)	58.46 (6.33)
Limitation (scaled score)	58.43 (8.04)
HADS	
Anxiety	9.60 (4.08)
Depression	8.01 (3.85)

Mean (standard deviation) reported for age, education, and evaluative measures. Number (percentage) reported for gender, race, employment status, and marital status. SD, standard deviation; SI-R, Savings Inventory—Revised; UHSS, UCLA Hoarding Severity Scale; LLFDI, Late-Life Function and Disability Instrument; HADS, Hospital Anxiety and Depression Scale.

Table 2

Correlations for all variables

Variables	HADS—anxiety	HADS—depression	UHSS	SI-R	LLFDI—frequency	LLFDI—limitation
Psychiatric symptoms						
HADS—anxiety						
HADS—depression	0.52**					
Hoarding severity						
UHSS	0.50**	0.30*				
SI-R	0.35**	0.50**	0.76**			
Disability						
LLFDI—frequency	-0.52**	-0.15	-0.35**	-0.22		
LLFDI—limitation	-0.47**	-0.25*	-0.46**	-0.34**	0.38**	

HADS, Hospital Anxiety and Depression Scale; UHSS, UCLA Hoarding Severity Scale; SI-R, Savings Inventory—Revised; LLFDI, Late-Life Function and Disability Instrument.

* $p < 0.05$;

** $p < 0.01$.

Table 3

Hierarchical regression analyses evaluating predictors of disability frequency

Measures	R^2	B	$SE B$	β
Step 1—demographic	0.026			
Age		0.085	0.130	0.081
Gender		1.791	1.695	0.132
Step 2—psychiatric symptoms	0.320**			
Anxiety		-0.982	0.189	-0.640**
Depression		0.255	0.203	0.154
Step 3—hoarding				
Model 1 UHSS	0.042*	-0.270	0.132	-0.269*
Model 2 SI-R	0.041*	-0.124	0.062	-0.267*

Coefficient data reported are those from the step at which the variable was entered into the equation. UHSS, UCLA Hoarding Severity Scale; SI-R, Savings Inventory—Revised.

* $p < 0.05$;

** $p < 0.001$.

Table 4

Hierarchical regression analyses evaluating predictors of disability limitation

Measures	R^2	B	$SE B$	β
Step 1—demographic	0.004			
Age		-0.024	0.166	-0.018
Gender		-1.048	2.158	-0.061
Step 2—psychiatric symptoms	0.231*			
Anxiety		-0.933	0.257	-0.483**
Depression		-0.021	0.277	-0.010
Step 3—hoarding				
Model 3 UHSS	0.075*	-0.453	0.177	-0.359*
Model 4 SI-R	0.058*	-0.186	0.084	-0.317*

Coefficient data reported are those from the step at which the variable was entered into the equation. UHSS, UCLA Hoarding Severity Scale; SI-R, Savings Inventory—Revised.

* p 0.05;

** p 0.001.