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Hoarding Disorder and Difficulties in Emotion Regulation

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Abstract

The present study aimed to examine self-reported deficits in emotion regulation (ER) among individuals with hoarding disorder (HD). Seventy-seven adult outpatients with HD and 45 age- and gender-matched healthy control (HC) participants received a diagnostic assessment and completed self-report measures of hoarding severity, depression, and anxiety. In addition, participants completed the *Difficulties in Emotion Regulation Scale* (DERS), which measures lack of emotional clarity (*Clarity*), difficulty regulating behavior when distressed (*Impulse*), difficulty engaging in goal-directed cognition and behavior when distressed (*Goals*), unwillingness to accept emotional responses (*Accept*), and lack of access to strategies for feeling better when distressed (*Strategies*). The HD group scored higher on all DERS subscales than did the HC group; self-reported ER deficits remained evident when controlling for baseline depression, anxiety, and stress. The DERS correlated significantly with hoarding severity in the HD group: acquiring was significantly correlated with DERS *Impulse, Strategies*, and *Accept*; saving was significantly correlated with DERS *Accept*. Correlations remained significant when controlling for depression, anxiety, and stress. Results suggest that HD is characterized by self-reported deficits in ER, and that this relationship is not solely attributable to high levels of depression and anxiety.

Keywords

Hoarding; emotion regulation; emotion; assessment

Hoarding disorder (HD) is characterized by a persistent difficulty discarding possessions, regardless of actual value (American Psychiatric Association, 2013). Most individuals with HD also engage in excessive acquiring of possessions (Frost, Tolin, Steketee, Fitch, & Selbo-Bruns, 2009). These behaviors result in the accumulation of significant clutter in the individual's home, compromising the ability to use the living spaces for their intended purpose (American Psychiatric Association, 2013). HD is common, with a reported prevalence of 2–5% (Cath, Nizar, Boomsma, & Mathews, 2017; Iervolino et al., 2009;

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Mueller, Mitchell, Crosby, Glaesmer, & de Zwaan, 2009; Nordsletten et al., 2013) and is associated with significant functional impairment (Ong, Pang, Sagayadevan, Chong, & Subramaniam, 2015) and public health cost (Tolin, Frost, Steketee, Gray, & Fitch, 2008).

The original cognitive-behavioral model of HD (Frost & Hartl, 1996) posits a critical role of emotional features such as fear and attachment. HD is strongly associated with the experience of negative emotions (Springer, Worden, & Tolin, in press). In addition to high baseline levels of anxiety and depression (Frost, Steketee, & Tolin, 2011; Wheaton, Timpano, Lasalle-Ricci, & Murphy, 2008), individuals with HD report strong feelings of anxiety and sadness elicited by the acts of sorting personal possessions in the laboratory (Grisham, Norberg, Williams, Certoma, & Kadib, 2010) and making discarding decisions about possessions (Frost, Ong, Steketee, & Tolin, 2016; Tolin et al., 2012). Even a hoarding-unrelated negative mood induction elicits greater feelings of sadness among nonclinical volunteers with elevated HD symptoms vs. those without HD symptoms (Timpano, Shaw, Cougle, & Fitch, 2014), suggesting an underlying vulnerability to experience negative emotion.

The significant negative emotions associated with HD, as well as the behavioral sequelae of these emotions (difficulty discarding and acquiring), suggest a role for deficits in emotion regulation (ER). ER is broadly defined as the process of changing the experience or expression of emotion via a number of different strategies, including situation selection, situation modification, attentional deployment, cognitive change, and response modulation (Gross, 1998). Gratz and Roemer (2004) have suggested a model of ER deficits that, while distinct from the Gross (1998) model of ER, may have significant implications for clinical assessment and intervention. Using a self-report measure, the *Difficulties in Emotion Regulation Scale* (DERS), they found six components of self-reported ER difficulties: (1) lack of emotional awareness (*Awareness*), (2) lack of emotional clarity (*Clarity*), (3) difficulty regulating behavior when distressed (*Impulse*), (4) difficulty engaging in goal-directed cognition and behavior when distressed (*Goals*), (5) unwillingness to accept certain emotional responses (*Accept*), and (6) lack of access to strategies for feeling better when distressed (*Strategies*).

To date, one study has measured self-reported ER deficits using the DERS in HD patients. Fernandez de la Cruz et al. (2013) sampled 24 patients with HD, 19 with HD plus obsessive-compulsive disorder (OCD), 17 with OCD only, and 20 healthy control (HC) participants. Individuals with HD (with and without comorbid OCD) scored higher (more self-reported deficits) than did HC participants on the DERS subscales *Goals* and *Strategies* only. The DERS subscale scores did not correlate significantly with HD severity across the entire clinical sample (Fernandez de la Cruz et al., 2013). Several limitations of this study, however, complicate interpretation of the results. First, the study did not account for baseline negative emotion (e.g., depression and anxiety). This is important because HD is associated with high levels of negative emotion, as described above, and because DERS scores correlate strongly with measures of depression and anxiety (Bjureberg et al., 2016; Fowler et al., 2014). It is therefore not clear whether the obtained group differences reflect deficits in ER, or whether they are artifacts of negative emotions. Second, HD participants were significantly older than the HC participants (56 vs. 40 years; see Landau et al., 2011) and

DERS scores tend to decrease (indicating less ER deficit) with age (Orgeta, 2009). It is therefore not clear whether stronger between-group differences would have been found with an age-matched control group. Finally, the study relied on the total score of a self-report measure of HD, the *Saving Inventory-Revised* (SI-R; Frost, Steketee, & Grisham, 2004), which combines reports of difficulty discarding, acquiring, and clutter. The inclusion of clutter, which is an environmental outcome of behavior rather than a behavior itself (such as saving or acquiring behaviors), may have obscured relationships between ER deficits and the core behavioral features of HD.

The aim of the present study was to address the limitations of previous studies in this field and examine self-reported deficits in ER in HD patients and age-matched HC participants. It was predicted that 1) HD patients would report greater global ER deficits than would HC participants; 2) DERS subscales would correlate significantly with HD-related behaviors; and 3) group comparisons and correlational analyses would remain significant even after controlling for baseline negative emotion.

Method

Participants

One hundred nineteen prospective HD patients were screened for inclusion criteria as part of a large clinical trial examining the neural mechanisms of CBT response in hoarding disorder. To be included in the study clinical participants were required to (1) have a primary diagnosis of HD of at least moderate severity according to DSM-5 (American Psychiatric Association, 2013) criteria; (2) be aged 18–65; (3) be unmedicated or on a stable dose of psychiatric medications for at least 8 weeks; (4) be willing and able to abstain from the use of stimulant or benzodiazepine medications on the day of testing; (5) be right-handed, and (6) be free of non-removable metal in the body, claustrophobia, or other factors that would preclude functional magnetic resonance imaging (fMRI). Of 119 prospective clinical participants, 32 were excluded due to failing to meet inclusion criteria; the most common reasons for exclusion were age and medication use. An additional 10 participants met inclusion criteria but discontinued prior to completing the study measures, leaving a final sample of 77 HD patients.

An additional 60 prospective healthy control (HC) participants were screened for eligibility. To be eligible for the study the HC participants were required to 1) have no current or past psychiatric diagnosis or treatment; (2) be aged 40–65 (for age matching to the HD sample); (3) be right-handed; and (4) be free of non-removable metal in the body, claustrophobia, or other factors that would preclude fMRI. Of the 60 prospective HC participants, 15 were excluded due to failing to meet inclusion criteria, leaving a final HC sample of 45 participants. The most common reason for exclusion in the HC sample was a history of psychiatric problems (current or past).

Measures

DSM-5 diagnoses were assessed using the *Diagnostic Interview for Anxiety, Mood, and Obsessive-Compulsive and Related Neuropsychiatric Disorders* (DIAMOND; Tolin et al.,

2018), a semi-structured clinical interview. The DIAMOND HD diagnosis shows excellent inter-rater reliability (κ = 0.86), very good test-retest reliability (κ = 0.64), and strong convergence with the SI-R (Tolin et al., 2018).

Hoarding symptom severity was assessed with the *Saving Inventory-Revised* (SI-R; Frost et al., 2004), a 23-item self-report measure that yields a total score as well as three subscales: *Clutter* (α = .98 in the present sample), *Saving* (α = .96 in the present sample), and *Acquiring* (α = .94 in the present sample). The SI-R readily discriminates HD from OCD patients and community controls, and correlates significantly with ratings of clutter and impairment (Frost et al., 2004). We also administered the *Hoarding Rating Scale-Interview* (HRS-I; Tolin, Frost, & Steketee, 2010), a 5-item clinician-rated interview of the severity of clutter, difficulty discarding, acquisition, distress, and impairment (α= .97 in the present sample). The HRS has good convergent validity and reliably differentiates HD patients from those with OCD and HCs (Tolin et al., 2010; Tolin et al., in press).

Affective symptoms were measured using the *Depression Anxiety Stress Scales* (DASS; Lovibond and Lovibond 1995), a 42-item self-report measure assessing three subscales of negative emotion: depression, anxiety, and stress/tension. Each item is rated on a 4 point scale assessing symptom frequency over the past week. Subscales of the DASS show high internal consistency (α = 0.89 −0.96) and good discriminant and divergent validity (Brown, Chorpita, Korotitsch, & Barlow, 1997). The depression (DASS-D, α = .95), anxiety (DASS-A, α = .91) and stress (DASS-S, α = 0.95) subscales showed excellent internal consistency in the present sample.

Self-reported trait-level ER difficulties were assessed using the *Difficulties in Emotion Regulation Scale* (DERS; Gratz & Roemer, 2004). Higher DERS scores reflect greater subjective impairment or dysregulation. As described above, the DERS subscales reflect lack of emotional awareness (*Awareness*; e.g., “I am attentive to my feelings;” α = .88 in the present sample); b) lack of emotional clarity (*Clarity*; e.g., “I have difficulty making sense out of my feelings;” α = .87 in the present sample); difficulty regulating behavior when distressed (*Impulse*; e.g., “When I’m upset, I become out of control;” α = .88 in the present sample); difficulty engaging in goal-directed cognition and behavior when distressed (*Goals*; e.g., “When I’m upset, I have difficulty getting work done;” α = .90 in the present sample); unwillingness to accept certain emotional responses (*Accept*; e.g., “When I’m upset, I become angry at myself for feeling that way;” α = .70 in the present sample); and lack of access to strategies for feeling better when distressed (*Strategies*; e.g., “When I’m upset, I believe there is nothing I can do to feel better;” α = .93 in the present sample). Validation studies have confirmed that the DERS has generally strong psychometric properties in community (Ritschel, Tone, Schoemann, & Lim, 2015) and clinical samples (Osborne, Michonski, Sayrs, Welch, & Anderson, 2017). One exception is that the *Awareness* subscale, which psychometric studies have reliably identified as having inadequate incremental and construct validity, including the absence of expected factor loadings, poor convergence with the other DERS subscales, and weak or absent associations with theoretically relevant symptoms of psychopathology (Bardeen, Fergus, Hannan, & Orcutt, 2016; Hallion, Steinman, Tolin, & Diefenbach, under review; Osborne et al., 2017). Consequently, there is an emerging consensus that the *Awareness* subscale should be excluded in most cases,

including the exclusion of *Awareness* items from the total score (e.g., Bardeen et al., 2016; Hallion et al., under review). For example, recent efforts to develop a DERS short form have excluded the *Awareness* items entirely (i.e., DERS-16; Bjureberg et al., 2016). The *Awareness* subscale was therefore excluded from analyses in the present study, and the total DERS score excluded items from that subscale.

Procedure

All study procedures were approved by the Hospital Institutional Review Board and all participants provided written informed consent prior to any study procedures. The present study was conducted as part of a clinical trial for HD, and the HD group was seeking treatment as part of the clinical trial. The HC group was recruited via newspaper advertisements and flyers in the community. All participants (HD and HC) met with a doctoral-level psychologist or supervised postdoctoral fellow, trained in the use of the DIAMOND and HRS-I, to determine whether they met diagnostic criteria for enrollment. They then completed, on a subsequent day, a battery of self-report measures, including the SI-R, DASS, and DERS. Further aspects of the clinical trial will be described elsewhere. All participants received monetary compensation for participation. Age and gender information was collected during an initial telephone screen, and HC participants were enrolled proportional to those in the HD group in order to ensure group equivalence on these variables.

Data analysis

DERS scores were compared for HD and HC participants using a series of univariate general linear models (GLMs), with and without the DASS subscales as covariates. Effect sizes of partial eta-squared (η^2_p), for which values of .01, .06, and .14 are conventionally considered to reflect small, medium, and large effects, respectively (Richardson, 2011), were calculated. Examining the HD group separately, we then used Pearson correlations (r) between the subscales of the DERS and those of the SI-R; Spearman's correlations (ρ), controlling for DASS subscales were also used. All analyses were conducted using SPSS v. 19.

Results

HD participants who discontinued prior to completing the study measures ($n = 10$) did not differ from HD participants who completed the study measures ($n = 77$) in terms of age ($t = -0.79$, $p = .43$), Hispanic ethnicity, $\chi^2(1) = 1.46$, $p = .23$, and nonwhite race, $\chi^2(1) = 1.58$, $p = .21$. Discontinued participants had a greater proportion of males than did those who completed, $\chi^2(1) = 4.10$, $p = .04$. DASS total and subscale scores, SI-R total and subscale scores, and HRS-I scores (all ts < 0.97, all ps > .05) did not differ between groups.

As shown in Table 1, the sample was predominantly female and non-Hispanic White, with an average age of 54 years. The HD and HC samples did not differ in terms of gender, age, or ethnicity, though a higher percentage of HC participants were nonwhite. As expected, the HD group scored significantly higher than did the HC group on SI-R, HRS-I, DASS-D, DASS-A, and DASS-S.

To identify meaningful covariates, we calculated correlation coefficients, in the combined sample, between the DERS total score and theoretical variables of interest. DERS total score did not correlate significantly with age ($r = -0.03$) or years of education ($r = 0.11$), and did not differ according to gender ($t = 1.66$) or nonwhite status ($t = 0.98$). DERS total did correlate significantly ($p < .05$) with DASS-D ($r = 0.78$), DASS-A ($r = 0.69$), and DASS-S ($r = 0.77$). The DASS subscale scores were therefore used as covariates in subsequent analyses.

Univariate GLMs indicated that the HD group scored higher on all DERS subscales than did the HC group (see Table 2). Effect sizes were generally in the large range. When the DASS subscales were added as covariates, univariate GLMs indicated that the HD group scored higher on the *Goals* and *Clarity* subscales than did the HC group (see Table 3).

As shown in Table 4, the DERS total score and SI-R total score were moderately and significantly correlated in the HD group. Among the subscales, SI-R *Acquiring* was significantly correlated with DERS *Impulse, Strategies*, and *Accept*. SI-R *Saving* was significantly correlated with DERS *Accept* only. SI-R clutter did not correlate with any DERS subscale or the DERS total, and the DERS *Clarity* subscale did not correlate significantly with any of the SI-R subscales or the SI-R total. We also calculated partial correlation coefficients in the HD group, controlling for the DASS subscales. As shown in Table 5, the DERS total score and SI-R total score remained moderately and significantly correlated. SI-R *Acquiring* correlated significantly with DERS *Impulse, Goals, Strategies*, and *Clarity*. SI-R saving correlated significantly with DERS *Goals*, *Strategies*, and *Clarity*. SI-R *Clutter* was significantly correlated with DERS *Goals*.

Discussion

The aim of this study was to examine self-reported deficits in ER in HD patients and age-matched HC participants. Consistent with the findings of Fernandez de la Cruz et al. (2013), HD patients endorsed greater deficits in ER than did control participants. Specifically, compared to HC participants, HD patients reported greater lack of emotional clarity, difficulty regulating behavior when distressed, difficulty engaging in goal-directed cognition and behavior when distressed, unwillingness to accept emotional responses, and lack of access to strategies for feeling better when distressed. Importantly, even though HD patients endorsed greater depression, anxiety, and stress symptoms, group differences in lack of emotional clarity and difficulty engaging in goal-directed cognition and behavior when distressed remained significant when controlling for this higher baseline negative affect.

In the HD group, the core behavioral features of HD (saving and acquiring) were correlated with self-reported ER deficits. Specifically, SI-R *Saving* was positively correlated with DERS *Accept*, while SI-R *Acquiring* was positively related to DERS *Accept, Impulse,* and *Clarity.* Importantly, most of these associations remained even after controlling for general negative affect (depression, anxiety, and stress symptoms). These results suggest that saving behavior may be, at least in part, motivated by difficulty accepting negative emotions. A closer look at the *Accept* items suggests that this subscale assesses the tendency to judge or criticize oneself for feeling certain emotions (e.g., “When I’m upset, I feel ashamed with myself for feeling that way”; “When I’m upset, I become irritated with myself for feeling

that way"). As such, it is possible that patients with HD save their possessions in order to avoid the negative emotions themselves and the self-criticism that results from the negative emotions.

Consistent with these results, a recent study found positive associations between self-criticism and hoarding severity (Chou et al., 2017). Interestingly, in that study, beliefs about responsibility for possessions (as described by Steketee, Frost, & Kyrios, 2003) mediated the relationship between self-criticism and HD severity, suggesting that inflated responsibility beliefs may be more important to HD symptoms than self-criticism. When controlling for general negative affect, SI-R *Saving* was related to DERS *Strategies* and *Goals,* indicating that saving behavior may also be motivated by lack of access to more adaptive strategies for regulating negative emotions (besides saving), as well as inability to refocus attention on other goals and tasks when feeling negative emotions. Taken together, these results support the notion that saving behavior ultimately functions as an avoidance strategy; patients with HD seem to lack the ER skills to cope effectively with emotions that may result from discarding possessions, so discarding is avoided entirely.

Results of the current study indicate that acquiring behavior is associated with impulsivity, lack of emotional acceptance, and lack of access to more effective strategies for regulating emotions. Previous research has also found positive associations between impulsivity and HD symptoms (Timpano et al., 2013), particularly urgency (i.e., impulsivity in response to negative emotions and/or as a means to avoid negative affect). Again, these findings suggest that avoidance of negative emotions may motivate HD behaviors (acquiring and discarding).

It is interesting that the DERS was not related to SI-R *Clutter* in the current study. This might be explained by the fact that clutter is not a behavior but rather is the *consequence* of saving and acquiring behaviors. A meta-analysis of CBT for HD found less overall change in clutter severity during treatment compared to saving and acquiring (Tolin, Frost, Steketee, & Muroff, 2015), suggesting that clutter is a relatively stable variable that, while important as an outcome variable, may be less informative about the maintenance of HD.

Taken together, the findings of the current study suggest that ER deficits are common in HD patients and may be an important mechanism of HD symptomatology. The original cognitive-behavioral model of HD (Frost & Hartl, 1996) largely emphasized the role of maladaptive cognitions; the cognitive mechanisms were further explicated by (Steketee et al., 2003). Maladaptive emotions were part of the model but received comparably less emphasis. More recent theoretical and empirical work has emphasized the role of intense affective experience in maintaining hoarding behaviors (Ayers, Castriotta, Dozier, Espejo, & Porter, 2014; Fernandez de la Cruz et al., 2013; Springer et al., in press), expanding the original model and suggesting that hoarding-related behaviors (saving and acquiring) may represent attempts to avoid strong emotions. As such, it may be beneficial to incorporate ER skills and practice exercises into HD treatment. With the current study's results in mind, skills aimed at increasing distress tolerance (i.e., the perceived ability to manage and cope with negative emotions), may be most helpful to counteract the tendency of HD patients to engage in hoarding behaviors in order to avoid negative feelings. In turn, these skills may increase willingness to confront rather than avoid distressing emotions, particularly in the

context of discarding and resisting acquiring. Borrowed from dialectical behavior therapy (Linehan, 2014), these distress tolerance skills may include mindfulness, self-soothing, decreasing vulnerability to negative emotions (e.g., pleasant activity scheduling), and radical acceptance, to name a few examples. To this end, in our own work, we have recently made efforts to incorporate acceptance skills into our treatment with HD patients. Our most recent treatment manual includes strategies to teach patients how to cope with negative emotions without trying to change them, particularly in the context of sorting/discarding possessions and resisting acquiring (Tolin, Worden, Wootton, & Gilliam, 2017).

The current study had several limitations. First, this was a treatment-seeking sample of HD patients, which may not represent the entire range of HD severity and ER deficits. Research suggests that many HD patients do not seek treatment voluntarily (Frost, Tolin, & Maltby, 2010), indicating that there may be important differences between treatment-seeking HD patients and those who seek treatment involuntarily or never present for treatment in the first place. Second, because these data were collected as part of an ongoing clinical trial using fMRI, we had somewhat strict inclusion criteria (e.g., medication restrictions, at least moderate HD severity, right-handed) that may not be representative of all treatment-seeking HD patients. It will be important to replicate these findings in more diverse samples of individuals with HD. Third, we were limited to a self-report measure of ER, which may not accurately represent ER deficits due to patients' lack of insight, social desirability, or other factors. Behavioral measures of ER capacity (e.g., distress tolerance, as assessed by the Physiological Pain Tolerance Task) could provide a more comprehensive and objective picture of ER. Future studies should employ multimodal assessment of ER in HD patients. Fourth, the current study design cannot determine causality; such a determination would require experimental manipulation of the key variables. It is not clear, therefore, whether ER deficits cause hoarding, whether hoarding causes ER deficits, or whether both are caused by an as-yet unknown variable. Fifth, there are inherent limitations in assessing ER capacity due to the potential confound of distress severity. Indeed, it is difficult to determine whether individuals who score high on the DERS or other measures of ER deficits are actually worse at regulating negative affect or are simply experiencing more negative emotions to begin with. Future studies might employ behavioral measures of ER capacity that use standardized behavioral tasks to tease apart ER capacity from negative affect intensity. Finally, the present study did not systematically assess the presence of personality disorders. These disorders, borderline personality disorder in particular, have been associated with ER deficits (Gratz, Rosenthal, Tull, Lejuez, & Gunderson, 2006), and some research suggests that HD may be associated with elevated rates of certain personality disorders (Frost et al., 2011; Frost, Steketee, Williams, & Warren, 2000). It therefore is not clear how undiagnosed personality disorder, in either the HD or HC group, might have affected the results.

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Highlights

- Examined self-reported deficits in emotion regulation (ER) in adult patients with hoarding disorder (HD).
- Compared to healthy control participants, HD patients reported greater deficits in ER, with large effect sizes.
- ER deficits were evident even when controlling for depression and anxiety.
- ER deficits correlated significantly with severity of hoarding-related behaviors in the HD group.

Table 1

Sample characteristics.

	HC	HD	χ^2	*t*
Female [N(%)]	33 (73%)	66 (86%)	2.85	
Age [M(SD)]	53.49 (7.15)	54.27 (9.39)		0.48
Hispanic [N(%)]	4 (9%)	2 (3%)	2.40	
Nonwhite [N(%))]	10 (22%)	6 (8%)	5.19 *	
SI-R total [M(SD)]	8.69 (6.75)	61.29 (11.17)		28.64 **
HRS-I total [M(SD)]	0.36 (0.78)	27.17 (4.22)		41.70 **
DASS-D [M(SD)]	0.96 (2.58)	9.90 (8.51)		6.85 **
DASS-A [M(SD)]	0.80 (2.03)	5.80 (6.69)		4.88 **
DASS-S [M(SD)]	2.84 (3.86)	13.10 (8.50)		7.63 **
Comorbid obsessive-compulsive disorder [N(%)]	0 (0%)	10 (13%)		
Comorbid depressive disorder [N(%)]	0 (0%)	41 (55%)		
Comorbid anxiety disorder	0 (0%)	27 (36%)		

HC = Healthy control group. HD = Hoarding disorder group. SI-R = Saving Inventory-Revised. HRS-I = Hoarding Rating Scale-Interview. DASS-D = Depression Anxiety Stress Scales, Depression subscale. DASS-A = Depression Anxiety Stress Scales, Anxiety subscale DASS_S = Depression Anxiety Stress Scales, Stress subscale.

* $p < .05$.

** $p < .01$.

Table 2

Mean scores on the Difficulties in Emotion Regulation Scale (DERS) for hoarding disorder (HD) patients vs. healthy controls (HC).

DERS score	Group	Mean	Std. Error	*F*	*p*	η^2_p
Total[a]	HC	41.31	3.15	49.76	< .001	.29
	HD	69.27	2.41			
Accept	HC	8.07	1.06	18.49	< .001	.13
	HD	13.83	0.81			
Goals	HC	9.20	0.62	55.05	< .001	.31
	HD	15.01	0.48			
Impulse	HC	7.33	0.66	28.23	< .001	.19
	HD	11.75	0.51			
Strategies	HC	10.09	0.89	38.13	< .001	.24
	HD	17.00	0.68			
Clarity	HC	6.62	0.56	50.93	< .001	.29
	HD	11.67	0.43			

HC = Healthy control group. HD = Hoarding disorder group. DERS = Difficulties in Emotion Regulation Scale.

[a] excluding the *Awareness* subscale items.

Table 3

Estimated marginal mean (standard error) scores on the Difficulties in Emotion Regulation Scale (DERS) for hoarding disorder (HD) patients vs. healthy controls (HC), controlling for depression, anxiety, and stress.

	Group	Mean	Std. Error	*F*	*p*	η^2_p
Total[a]	HC	53.01	2.51	2.41	0.12	0.02
	HD	62.43	1.84			
Accept	HC	10.34	1.08	0.41	0.52	0.00
	HD	12.51	0.80			
Goals	HC	11.06	0.58	7.39	0.01	0.06
	HD	13.92	0.42			
Impulse	HC	9.63	0.56	0.04	0.85	0.00
	HD	10.41	0.41			
Strategies	HC	13.38	0.71	0.62	0.43	0.00
	HD	15.07	0.52			
Clarity	HC	8.60	0.48	4.91	0.03	0.04
	HD	10.52	0.35			

HC = Healthy control group. HD = Hoarding disorder group.

[a]excluding the *Awareness* subscale items.

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Table 4

Correlations, among patients with hoarding disorder, between scores on the Difficulties in Emotion Regulation Scale (DERS) and the Saving Inventory-Revised (SI-R).

	SI-R			
DERS score	**Total**	***Clutter***	***Saving***	***Acquiring***
Total[a]	.33**	.19	.25*	.29**
Accept	.30**	.20	.25*	.24*
Goals	.27*	.18	.22	.21
Impulse	.26*	.12	.16	.29*
Strategies	.30**	.16	.25	.26*
Clarity	.20	.11	.11	.22

*$p < .05$.

**$p < .01$.

[a]excluding the *Awareness* subscale items.

Table 5

Correlations, among patients with hoarding disorder, between scores on the Difficulties in Emotion Regulation Scale (DERS) and the Saving Inventory-Revised (SI-R), controlling for depression, anxiety, and stress.

	SI-R			
DERS score	**Total**	***Clutter***	***Saving***	***Acquiring***
Total[a]	.26**	.18	.26**	.29**
Accept	.15	.11	.15	.16
Goals	.31**	.27**	.34**	.29**
Impulse	.06	−.01	.04	.17
Strategies	.19*	.11	.21*	.23*
Clarity	.24**	.19*	.23*	.26**

* $p < .05$.

** $p < .01$.

[a] excluding the *Awareness* subscale items.