

Original Research

Effects of Trauma, Shame, and Self-Criticism on Hoarding: Comparative Data and Treatment ImplicationsChia-Ying Chou ¹, Christine Valdez ^{2, *}, Trevor Sanchez Stevens ³, Carol A. Mathews ⁴, Martha Shumway ⁵

1. San Francisco Center for Compassion Focused Therapies, San Francisco, CA, USA; E-Mail: chiaying.chou@sfcompassion.com
2. Department of Psychology, California State University - Monterey Bay, Seaside, CA, USA; E-Mail: chvaldez@csumb.edu
3. Department of Psychology, University of Delaware, Newark, DE, USA; E-Mail: tmss@udel.edu
4. Department of Medicine, University of Florida, Gainesville, FL, USA; E-Mail: carolmathews@ufl.edu
5. Department of Psychiatry, University of California San Francisco, San Francisco, CA, USA; E-Mail: martha.Shumway@ucsf.edu

* **Correspondence:** Christine Valdez; E-Mail: chvaldez@csumb.edu**Academic Editors:** Syd Hiskey and Neil Clapton**Collection:** [Compassion Focused Therapy \(CFT\) – Advances and Innovations](#)*OBM Integrative and Complementary Medicine*
2025, volume 10, issue 4
doi:10.21926/obm.icm.2504051**Received:** January 31, 2025**Accepted:** November 21, 2025**Published:** December 01, 2025**Abstract**

Severe trauma has a significant impact on self-attitudes and emotions, such as self-criticism and shame, and psychological symptoms. This topic has been more well studied among populations with Trauma and Stress-Related Disorders, but examined to a lesser extent in other clinical populations where adverse life events and potentially traumatic events are highly prevalent, such as Hoarding Disorder. The current study examined trauma exposure, and the relationships between trauma, self-criticism, shame, and symptom severity in a sample seeking treatment for hoarding (N = 81), compared to those seeking treatment for traumatic stress (N = 73). Results showed that the hoarding sample reported significantly



© 2025 by the author. This is an open access article distributed under the conditions of the [Creative Commons by Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium or format, provided the original work is correctly cited.

more lifetime trauma exposure, shame, self-criticism, and less self-reassurance than the trauma sample. Trauma exposure was related to greater posttraumatic stress but not hoarding symptom severity. A path analysis revealed a direct pathway from trauma exposure to posttraumatic stress symptom severity in the trauma sample, but an indirect pathway from trauma exposure through heightened self-criticism associated with greater shame that was subsequently related to greater hoarding symptom severity. The roles of shame and self-criticism on the development of Hoarding Disorder in the context of trauma is discussed. Moreover, a treatment approach addressing self-related difficulties, such as Compassion Focused Therapy, is introduced.

Keywords

Hoarding; self-criticism; negative self-attitudes; traumatic stress; trauma

1. Introduction

Up to 90% of people in the general population experience at least one potentially traumatic event at some point in their lives [1]. Trauma and Stress-Related Disorders (TSRD; [2]), such as Acute Stress Disorder (ASD) and Posttraumatic Stress Disorder (PTSD), have received a great amount of research attention given the direct link between trauma and TSRDs [1, 3]. However, TSRDs are not the only mental health consequences of trauma [4-6]. Studies have shown the substantial role trauma plays in a wide range of psychiatric diagnoses (e.g., major depressive disorder, bipolar disorders, substance use disorders, obsessive and compulsive related disorders, and psychotic disorders; [7-12]). To advance trauma science beyond TSRDs, it is necessary to examine non-TSRD diagnoses in which trauma may shape symptom expression via *transdiagnostic* self-processes (e.g., shame, self-criticism). From a developmental-psychopathology perspective, trauma exemplifies *multifinality*—a single risk that can culminate in *divergent clinical outcomes* depending on moderators such as cognitive style, emotion regulation, and social context [13, 14]. Testing these mechanisms across diagnoses can clarify when trauma's effects are *shared* versus *disorder-specific*.

Psychological factors such as negative self-attitudes and self-related emotions (e.g., self-criticism, self-hate, guilt, and shame) have been suggested to be not only common responses to trauma but also pathways through which trauma is associated with different psychiatric conditions [15-19]. For example, in a large U.S. national survey, self-criticism was found to significantly differentiate trauma survivors with PTSD from those without [20]. Self-blame was found to mediate the relation between childhood trauma and adult symptoms of depression and anxiety among veterans [21] and predict the severity of PTSD symptoms after experiencing a sexual assault [17]. Similarly, shame and guilt were found to mediate the relation between childhood trauma and somatic symptoms in a cross-diagnostic outpatient sample [22]. Shame also mediated the relation between childhood trauma and hallucination proneness in the general public [23]. Conversely, self-compassion has been shown to be significantly and negatively associated with PTSD severity [24]. In a study among firefighters, self-compassion buffered the effects of self-criticism on depressive symptoms in those who were severely trauma-exposed [25]. Cumulatively, these studies illuminate how, through different negative self-attitudes or self-related emotions, trauma impacts the symptom presentation of a

variety of diagnoses. This area of research is of great clinical value in identifying targets for treatment intervention for those impacted by trauma.

A relatively new diagnosis that may warrant trauma-focused research attention is hoarding disorder (HD). HD is a strong test case for this approach because it is not classified as a TSRD yet shows documented links to trauma exposure and to self-related processes. Hoarding is defined by significant difficulties in discarding personal possessions, which results in clutter and other psychosocial impairments [2]. Trauma has been associated with greater hoarding symptom severity, and identified by some, who experience hoarding, as a contributing factor for the onset of hoarding [26-29]. Additionally, challenges in self-related constructs, such as self-worth, self-identity, and self-attitudes have been associated with more severe symptoms among those with HD [30-32]. Research is needed to examine the roles of trauma, self-attitudes, and self-related emotions as they relate to hoarding symptoms versus traumatic stress symptoms to inform trauma-related pathogenesis implicated in different clinical populations. Demonstrating whether shame and self-criticism mediate links from trauma to diagnosis-relevant symptoms would extend trauma research beyond TSRDs, support risk differentiation implied by multifinality [13, 14], and identify mechanism-level targets for trauma-informed intervention in heterogeneous clinical populations.

To this end, the current study included and compared data from studies of two distinct clinical samples: one consisted of treatment seekers for HD (referred to as the hoarding sample hereafter); and the other for traumatic stress (referred to as the trauma sample hereafter). The aims of the current study were (1) to compare rates of trauma exposure, shame, and self-criticism between the two samples, and (2) to examine the roles of shame and self-criticism in the relation between trauma and psychiatric symptom severity (hoarding symptoms in the hoarding sample and posttraumatic stress symptoms in the trauma sample).

First, we hypothesized that rates of trauma exposure would be higher among the trauma sample than the hoarding sample, since exposure to trauma is, by definition, the trigger of posttraumatic stress. Second, we hypothesized that greater trauma exposure would be associated with both hoarding symptom severity and traumatic stress symptom severity, as has been shown in prior research (e.g., [1, 26]). Third, we hypothesized that there would be similar rates of shame and self-criticism between samples; that greater trauma exposure would be associated with more shame and self-criticism, and that more shame and self-criticism would be associated with more severe treatment-specific symptoms in both samples. Lastly, path analyses were conducted to explore shame and self-criticism as mediating pathways between trauma exposure and psychiatric symptom (i.e., hoarding vs. posttraumatic stress) severity outcomes in each sample. There was no specific hypothesis for the path analysis given the exploratory nature of these analyses. This design allows us to evaluate whether self-conscious processes operate as *shared* (transdiagnostic) or *diagnosis-specific* pathways from trauma exposure to clinical severity—an empirical test aligned with a multifinality framework.

2. Method

2.1 Participants and Procedures

2.1.1 Hoarding Sample

The hoarding sample was a convenience sample from a larger randomized controlled trial (RCT) examining the effectiveness of two forms of group Cognitive Behavioral Therapy (CBT) for HD [33]. The study took place at a university medical center and was approved by the university's Institutional Review Board (IRB). All participants provided informed consent to participate in all study procedures and were provided \$100 for their involvement when they completed the RCT.

Participants were individuals with significant HD symptom severity defined by 1) a positive screen for hoarding on two of three assessments: a score >42 on the Saving Inventory-Revised (SI-R; [34]), a score ≥ 20 on the UCLA Hoarding Symptom Scale (UHSS; [35]), and a score ≥ 12 on the Clutter Image Rating Scale-Revised (CI-R; [36]); and 2) meeting the DSM-5 criteria for HD assessed in a clinical interview. No individual was excluded because of any co-occurring psychiatric diagnosis. However, individuals with active disruptive psychotic symptoms, intellectual disability, moderate to severe dementia, acute high risk of suicide, or any medical conditions that might compromise their capacity to participate in therapy groups were excluded. Details about the recruitment process of the RCT were reported in a paper [33].

Eligible participants completed a pre-treatment clinical interview and self-report questionnaires pre- and post-CBT-based group treatment. We included data on the self-and symptom-related measures from the pre-, as opposed to the post-treatment questionnaires, in the current study to reduce confounding effects of the treatment. Data on trauma exposure was derived from a measure in the post-treatment battery in the RCT because this measure was only administered once post-treatment. Since the targeted measures were added halfway through the RCT, the sample in this study was a subgroup of 81 participants in the RCT who had completed these assessments.

The average age of the hoarding sample in this study was 60.3 ($SD = 9.3$), ranging from 37 to 78. Most participants identified as female (79%). Race was reported as: 58.5% Caucasian/White, 13.4% Multiracial, 6.1% Hispanic, 6.1% African American/Black, 6.1% Asian/Pacific Islander, 1.2% American Indian/Alaskan Native, 6.1% declined to respond. The majority of participants identified as heterosexual (79.3%); 13.4% identified as a member of the LGBTQ+ community, 6.1% either did not provide or declined to provide their sexual orientation. The average number of co-occurring diagnoses at the time of assessment was 1.04 ($SD = 1.27$, range = 0-4) with the most common comorbid diagnosis being a Depressive Disorder (42.0%, valid $n = 34$). Other diagnoses included: Posttraumatic Stress Disorder (18.5%), General Anxiety Disorder (16.0%), Agoraphobia (13.6%), Substance Use Disorder (6.2%), Social Phobia (6.2%), Bipolar Disorder (3.7%), Panic Disorder without Agoraphobia (2.5%), and Obsessive and Compulsive Disorder (2.5%).

2.1.2 Trauma Sample

The trauma sample was a convenience sample from a larger measurement development study on trauma-related cognitions [37]. This study took place at a university-affiliated community mental health clinic and was IRB-approved. All participants provided written informed consent to complete questionnaires and were provided a \$20 card. Recruitment was through clinicians providing

information about the study and inquiring about willingness to participate during the intake. Participants included 73 trauma survivors presenting for treatment at the clinic who were either 1) a victim of a crime that occurred within the last 3 years, 2) a survivor of torture in another country, or 3) a family member of a homicide victim. Participants reported an average age of 41.28 ($SD = 13.80$, range = 21-87). Most participants identified as female (60.3%). Race was reported as: 33.2% Hispanic, 24.7% Caucasian/White, 13.7% African American/Black, 9.6% Asian/Pacific Islander, 1.4% biracial, 15.1% specified 'Other' as their race, and 1.4% declined to respond. Most participants identified as heterosexual (58.9%), while others identified as: 13.7% homosexual, 5.5% bisexual, and 21.9% either declined to or did not identify their sexual orientation. The majority of the trauma sample (93.6%) met the criteria for *DSM-5* PTSD (57.1%, valid $n = 36$) or another TSRD (36.5%, $n = 23$; e.g., ASD, subthreshold PTSD). The number of current diagnoses averaged 2.13 ($SD = 1.43$, range = 0-8), with the most common comorbid diagnosis being a Depressive Disorder (36.9%, valid $n = 69$). Other diagnoses were: Substance Use Disorder (19.1%), Anxiety Disorder (16.4%), Bipolar Disorder (4.8%), Psychotic Disorder (3.2%), Eating Disorder (3.2%), or Gender Dysphoria (1.6%).

2.2 Measures

2.2.1 Trauma

In the hoarding sample, potential trauma exposure was assessed using the Traumatic Event Survey-Lifetime (TES-L; [38]), which is a 14-item self-report questionnaire assessing various types of *DSM-5*-defined trauma. Individuals endorsed “yes” if they experienced any of the inquired types of events, as well as rated the extent of subjective distress associated with each event.

In the trauma sample, potential trauma was assessed with the Trauma History Screen (THS; [39]) among 66 participants, as some participants did not complete the measure to limit trauma exposure due to increased distress during the intake. The THS is a 14-item self-report measure assessing exposure to thirteen specific types of events and one “other” event. Participants were asked to indicate whether they experienced each type of event (“yes” or “no”).

The first and second authors reviewed the TES-L and THS for overlap in traumatic events and identified nine events that both measures had in common: transportation accident, natural disaster, physical assault as a child, physical assault as an adult, sexual assault as a child, sexual assault as an adult, combat exposure, sudden/tragic death of a close other, and witnessing serious injury or death. A sum score was derived by adding the different types of discrete events experienced.

2.2.2 Psychiatric Diagnoses and Symptom Severity

In the hoarding sample, hoarding and other psychiatric diagnoses, including PTSD, were assessed using the Structured Interview for Hoarding Disorder (SIHD; [40]) and the Mini International Neuropsychiatric Interview (MINI; [41]), respectively, in a clinical interview. Hoarding symptom severity was assessed using the SI-R [34], a 23-item self-report questionnaire assessing hoarding symptoms in the three domains: difficulty discarding, excessive acquisition, and clutter. Responses range from 0 (not at all) to 4 (extreme), with higher scores indicating greater severity. Internal consistency for the SI-R is 0.93 [42].

In the trauma sample, psychiatric diagnoses were assessed in a clinical interview incorporating validated symptom checklists. PTSD symptom severity was assessed by the PTSD Checklist for *DSM-*

5 (PCL-5; [43]), which is a 20-item self-report questionnaire assessing posttraumatic stress based on DSM-5 criteria. Items are rated from 0 (*Not at All*) to 4 (*Extremely*). A total severity score is obtained by summing scores from each of the 20 items. Internal consistency for the PCL-5 has ranged from 0.91 in treatment-seeking military service members [44] to 0.94 in a college sample [45]. Internal consistency in this sample was 0.89.

PTSD symptom severity was not assessed in the hoarding sample. Similarly, hoarding symptoms were not assessed in the trauma sample.

2.2.3 Self-Related Measures

Self-Attitudes. Self-attitudes were measured using the Inadequate-Self (9 items), Hated-Self (5 items), and Self-Reassurance (8 items reversed scored) subscales of the Forms of Self-Criticizing/Attacking and Self-Reassuring Scale (FSCRS; [46]). The Inadequate-Self and Hated-Self subscales of FSCRS include self-critical cognitive and/or emotional responses occurring when things go wrong. Self-Reassuring refers to the ability to bring kindness, caring, and peacefulness to oneself when things go wrong. Response options range from 0 (*not at all like me*) to 4 (*extremely like me*), with higher scores indicating a greater level of self-attitude measured. In the current study, we summed the scores of the Inadequate-Self and Hated-Self subscales, and the reversed scores of the Self-Reassurance subscale to estimate the degree of overall self-criticism.

The FSCRS subscales show internal consistency ranging from $\alpha = 0.87$ to 0.89 for the Inadequate-Self, $\alpha = 0.83$ to 0.86 for the Hated-Self, and $\alpha = 0.85$ to 0.87 for the Self-Reassurance subscale in clinical samples; test-retest reliability in a 4-week interval ranging from $r = 0.65$ (Self-Reassurance) to $r = 0.78$ (Hated-Self); and convergent validity demonstrated by significant correlations with other measures assessing similar theoretical constructs [46-48]. In this study, Cronbach's alpha ranged from 0.81 (Hated-Self) to 0.91 (Inadequate-Self) for the hoarding sample and 0.78 (Hated-Self) to 0.90 (Self-Reassurance) for the trauma sample. Cronbach's alpha for the total scale was 0.92 for the hoarding sample and 0.93 for the trauma sample.

Shame. Shame was assessed using 6 questions modified from the Experience of Shame Scale [49]. Shame of the Self as a Person and Shame of One's Mental Health Problems were each assessed by three questions. Responses are made on a 1 (*not at all like me*) to 4 (*extremely like me*) scale. Significant correlations between the total score of these shame questions and that of the Inadequate-Self ($r = 0.64, p < 0.0001$) and Hated-Self subscales ($r = 0.54, p < 0.001$) of the FSCRS provide initial support for the convergent validity of this measure. Moreover, nonsignificant correlations between the total score of the shame questions and gender ($r = 0.16, p = 0.10$) and age at study participation ($r = 0.03, p = 0.74$) supported the discriminant validity. Cronbach's alpha for the hoarding sample was: 0.77 (mental health shame), 0.84 (self-shame), 0.83 (total shame). Cronbach's alpha for the trauma sample was: 0.85 (mental health shame), 0.67 (self-shame), 0.84 (total shame).

2.3 Data Analysis Plan

R version 4.0.5 [50] was used for statistical analyses. Seven participants from the trauma and one from the hoarding sample were dropped from the analyses due to having more than 80% missing

data on key analysis variables. The final sample size was 146 ($n = 80$ in the hoarding sample, $n = 66$ in the trauma sample).

Descriptive statistics were computed for all study variables by sample. Bivariate correlations examined relations between trauma exposure, psychiatric symptom severity (hoarding symptoms in the hoarding sample, posttraumatic stress symptoms in the trauma sample), and the self-related measures (i.e., self-attitudes and shame), using full information maximum likelihood (FIML) to account for missing data.

Differences in total trauma exposure and the self-related measures between samples were assessed with linear regressions using a maximum likelihood estimator and robust standard errors in the R package Lavaan version 0.6-8 [51]. Missing data were accounted for using FIML. Sample differences in total trauma exposure, age, and total psychiatric diagnoses were evaluated with simple linear regression, whereas differences in the self-related measures were evaluated with multiple regression conditioning on age, total psychiatric diagnoses, and total trauma exposures. Post-hoc tests of sample differences in the self-related measures were also conducted using multiple regression conditioning psychiatric diagnoses, age, and total trauma exposures. The null-hypothesis significance test of individual model parameters was assessed with Wald Z statistics [52]. To control for family-wise error, statistical significance was determined with Holm-Bonferroni corrected p-values [53] for each group of subscales (2 shame subscales and 3 self-attitude subscales).

Path analyses evaluated a conceptual model, based on correlational findings, theory, and research, of the relation between total trauma exposure and psychiatric symptom severity directly and indirectly through the self-related measures within each sample. Models were computed in the R software package Lavaan [51] using maximum likelihood estimation with standard errors and bias-corrected (BC) constructed confidence intervals for indirect effects; a BC bootstrap confidence interval which excludes 0 is considered to be evidence in support of mediation [54, 55]. Missing data were accounted for using FIML. Both models were structurally equivalent, except the terminal endogenous outcome variables assessing psychiatric symptom severity, hoarding versus traumatic stress. Total trauma exposure was the single exogenous variable.

Overall model fit was assessed with Yuan-Bentler T2 scaled χ^2 tests [56], the root mean square error approximation (RMSEA), comparative fit index (CFI), and the tucker-lewis index (TLI), and standardized root mean square residual (SRMR). Indications of acceptable fit include a non-significant scaled χ^2 test, $RMSEA < 0.08$, $CFI > 0.95$, $TLI > 0.95$, and $SRMR < 0.08$. The null-hypothesis significance test of individual model parameters were assessed with Wald Z statistics [52]. Multivariate normality in analysis variables was assessed with Marida multivariate kurtosis estimates and Henze-Zirkler tests using the R package “MVN” [57-59].

3. Results

Mardia estimates of kurtosis of multivariate normality found that path analysis variables were multivariate normal in both samples. Mardia kurtosis was -0.30 ($p = 0.763$) in the trauma sample and -1.42 ($p = 0.155$) in the hoarding sample. While no empirical cutoffs in Mardia kurtosis exist, a common rule of thumb is that Mardia kurtosis of greater than 3 may be concerning [60]. However, Henze-Zirkler tests of multivariate normality tests found that path analysis variables may be multivariate normal in the traumatic stress model ($HZ = 0.95$, $p = 0.054$), but not multivariate normal in the hoarding sample ($HZ = 1.10$, $p = 0.005$). Given the conflicting results and the existence of

missing data, both path analyses used robust Yuan-Bentler scaled χ^2 and sandwich-type standard error estimates [56].

Hoarding symptom severity in the hoarding sample averaged 2.88 ($SD = 0.51$, range = 1.65-4). Posttraumatic stress symptom severity in the trauma sample averaged 47.87 ($SD = 15.13$, range = 2-80). Those in the hoarding sample were significantly older ($b = 18.734$, 95% CI [14.783, 22.685], $z = 9.29$, $p < 0.001$) and reported significantly fewer co-occurring diagnoses ($b = -1.18$, 95% CI [-1.620, -0.736], $z = -5.221$, $p < 0.001$).

3.1 Differences between Sample

3.1.1 Trauma Exposure and Psychiatric Symptom Severity

The average number of total types of trauma reported in the overall sample was 4.21 ($SD = 2.32$, range = 0-9), with that being significantly higher in the hoarding ($M = 4.79$, $SD = 2.27$) than in the trauma sample ($M = 3.43$, $SD = 2.15$), $b = 1.35$, 95% CI [0.608, 2.099] $z = 3.56$, $p < 0.001$ ¹. Table 1 summarizes the percentages of the participants endorsing each trauma type by sample. The hoarding sample was overrepresented in exposure to transportation accidents, $\chi^2(1) = 50.62$, $p < 0.001$, natural disasters, $\chi^2(1) = 9.33$, $p = 0.002$, and witnessing serious injury or death, $\chi^2(1) = 4.17$, $p = 0.041$ ².

¹This difference remained significant when controlling for age and number of co-occurring diagnoses, $b = 2$, 95% CI [1.065, 2.938], $z = 4.19$, $p < 0.00$.

²After controlling for age, the sample significantly predicted transportation accidents (Odds Ratio = 0.03, 95% CI [0.01, 0.10], $p < 0.001$), natural disasters (Odds Ratio = 2.33, 95% CI [0.97, 5.57], $p = 0.058$), and witnessing serious injury or death (Odds Ratio = 2.80, 95% CI [1.14, 6.90], $p = 0.025$).

Table 1 Rates of Exposure to Lifetime Potential Trauma by Sample.

Trauma Type	Item(s) from the THS (trauma sample trauma questionnaire)	Item(s) from the TES-L (hoarding sample trauma questionnaire)	Hoarding Sample (<i>n</i> = 80)	Trauma Sample (<i>n</i> = 66)
			Valid %	Valid %
A bad transportation accident	A really bad car, boat, train, or airplane accident	Been in a car accident	91.1	31.4
Natural disaster	A hurricane, flood, earthquake, tornado, or fire	Been in a natural disaster	60.8	33.3
Physical assault as a child	Hit or kicked hard enough to injure - as a child	Been physically handled roughly, before age 18	54.7	45.5
Physical assault as an adult	Hit or kicked hard enough to injure - as an adult	Been physically handled roughly, after age 18	53.8	63.5
Sexual assault as a child	Forced or made to have sexual contact - as a child	Forced to have sexual activity, before age 18 Forced to have sexual intercourse, before age 18	39.7	45.3
Sexual assault as an adult	Forced or made to have sexual contact - as an adult	Forced to have sexual activity, after age 18	40.0	48.1
Combat exposure during military service	During military service - seeing something horrible or being badly scared	Served in combat?	8.9	2.4
Sudden death of a close other	Sudden death of close family or friend	Experienced the tragic death of someone close to you?	74.7	68.6
Witnessing serious injury or death	Seeing someone die suddenly or get badly hurt or killed	Witnessed a non- family death or injury	59.5	41.2

Note: Estimates were calculated in SPSS version 25 using listwise deletion for missing data.

3.1.2 Self-Related Measures

Accounting for sample differences (i.e., age, number of co-occurring diagnoses, and total trauma exposure), the hoarding sample reported significantly more shame ($b = 6.17$, 95% CI [4.25, 8.09], $z = 6.30$, $p < 0.001$) and higher levels of overall self-criticism, $b = 10.13$, 95% CI [3.47, 16.78], $z = 2.98$, $p < 0.003$ than the trauma sample (see Table 2).

Table 2 Descriptive Statistics for Self-Related Measures Between Samples.

	Hoarding Sample (<i>n</i> = 80)		Trauma Sample (<i>n</i> = 66)	
	Mean	Standard Deviation	Mean	Standard Deviation
Total Shame	17.01	3.70	12.29	4.07
Mental Health Shame	10.24	1.86	6.76	2.58
Self-Shame	6.83	2.38	5.53	1.97
Total Self-Criticism	38.30	17.01	37.02	16.91
Inadequate-Self	17.95	9.26	16.39	8.51
Hated-Self	4.93	4.44	4.92	4.30
Self-Reassurance	15.48	6.19	16.24	7.11

3.2 Associations between Trauma, Symptom Severity, and Self-Related Measures by Sample

3.2.1 Correlations

In the hoarding sample, total trauma exposure was significantly associated with greater self-criticism ($r = 0.31$, $p = 0.002$), but non-significantly associated with shame or hoarding symptom severity (see Table 3). In the trauma sample, total trauma exposure was not associated with any of the self-related measures, but it was significantly associated with posttraumatic stress symptom severity ($r = 0.33$, $p = 0.009$). Symptom severity was related to shame ($r = 0.33$, $p = 0.003$) but not self-criticism in the hoarding sample. In the trauma sample, symptom severity was not significantly associated with any of the self-related measures.

Table 3 Correlations between Trauma, Psychiatric Symptom Severity, and Self-Attitudes by Sample.

	(1)	(2)	(3)	(4)
(1) Total Traumas	--	0.22	0.31**	0.09
(2) Symptom Severity	0.33*	--	0.15	0.33**
(3) Total Self-Criticism	0.22	0.10	--	0.59***
(4) Total Shame	0.07	0.18	0.70***	--

Note. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$. Top half diagonal correlation matrix represents hoarding sample and bottom half diagonal correlation matrix represents trauma sample. (2) symptom severity represents hoarding symptoms for hoarding sample and posttraumatic stress symptoms for trauma sample.

3.2.2 Path Analysis: Hoarding Sample

The path analysis model addressing the proposed structural relationship between total trauma exposure, self-criticism and shame, and hoarding symptom severity displayed good fit with the data, Yuan-Bentler scaled $\chi^2(1, n = 80) = 1.095$, $p = 0.295$; RMSEA = 0.035; CFI = 0.998; TLI = 0.989; SRMR = 0.027. Considering direct effects, sum total trauma exposures were significantly associated with self-criticism ($b = 2.329$, 95% CI [0.86, 3.80], $z = 3.10$, $p = 0.002$), however, sum total trauma exposure was not significantly associated with hoarding symptom severity ($b = 0.05$, 95% CI [-0.01, 0.10], $z =$

1.86, $p = 0.062$). Self-criticism was significantly associated with shame ($b = 0.13$, 95% CI [0.09, 0.16], $z = 7.19$, $p < 0.001$), however, self-criticism was not significantly associated with hoarding symptom severity ($b = -0.01$, 95% CI [-0.01, 0], $z = -1.31$, $p = 0.19$). Finally, shame was significantly associated with hoarding symptom severity ($b = 0.56$, 95% CI [0.02, 0.09], $z = 3.25$, $p = 0.001$). Two indirect effect pathways were also examined. First, the indirect effect of total trauma exposure on hoarding symptom severity serially mediated through self-criticism and shame was estimated as $b = 0.02$, 95% bootstrap (10,000 respamples) BC CI [0.01, 0.04]³. Second, an indirect effect of total trauma exposure on hoarding symptom severity mediated through self-criticism (but not shame) was estimated as $b = -0.01$, 95% bootstrap (10,000 resamples) BC CI [-0.04, >0.00]. The total effect of the model was estimated at $b = 0.56$, 95% bootstrap (10,000 resamples) BC CI [>0.00, 0.10]. The estimated model, along with standardized effects, is displayed in Figure 1.

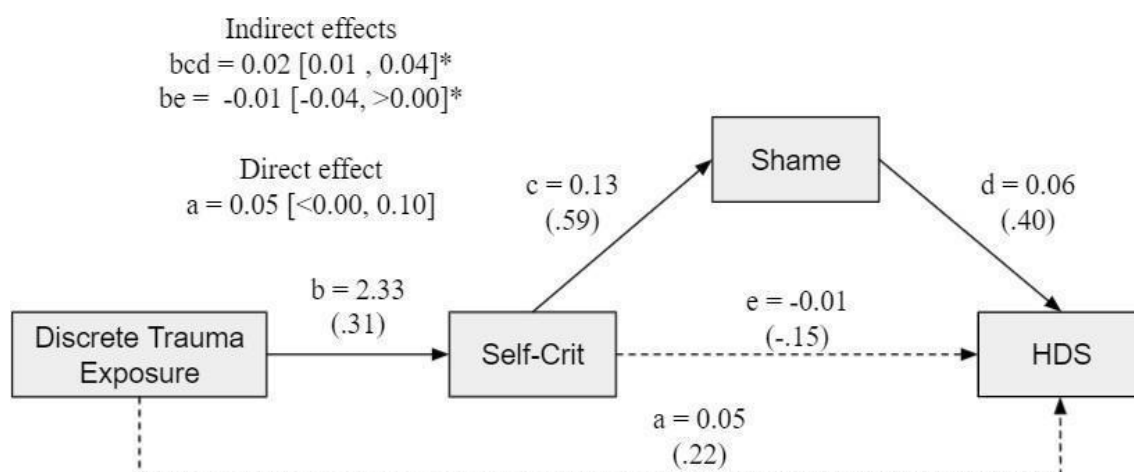


Figure 1 HDS Path model figure. Note. Solid lines indicate significant direct effects, broken lines indicate non-significance. * = BC bootstrapped 95% confidence intervals. Standardized regression coefficients are contained in ().

3.2.3 Path Analysis: Trauma Sample

The path analysis model addressing the proposed structural relationship between total trauma exposures, self-criticism and shame, and posttraumatic stress symptom severity displayed good fit with the data, Yuan-Bentler scaled $\chi^2(1, n = 66) = 0.411$, $p = 0.521$; RMSEA < 0.001; CFI = 1; TLI = 1;

³Because a subset of the HD sample carried a PTSD diagnosis, we conducted three sensitivity checks using the binary PTSD indicator variable (PTSDx): (1) re-estimating the HD path model excluding participants with comorbid PTSD ($n = 66$, missingness accommodated by FIML); (2) re-estimating the model including PTSDx as an exogenous covariate predicting all response variables (self-criticism, shame, hoarding severity, $n = 80$, missingness accommodated by FIML); and (3) a multigroup model comparing HD-only ($n = 65$; 1 missing discrete trauma exposure data) and HD + PTSD ($n = 13$; 1 participant missing PTSDx data). The indirect pathway (self-criticism → shame → hoarding severity) remained significant and directionally consistent across (a) HD-only (indirect effect $cd = 0.01$, $z = 2.33$, $p = 0.02$), (b) PTSDx-adjusted (indirect effect $cd = 0.01$, $z = 3.11$, $p = 0.002$), and (c) multigroup specifications (in the HD-only group, the cd path was $0.019 [z = 2.6, p = 0.008]$, and in the HD + PTSD group the cd effect was 0.005 , $z = 2.2$, $p = 0.028$; the difference between the two was not statistically significant [path difference of -0.014 , $z = -1.829$, $p = 0.067$]). However, the multigroup model was underpowered to detect group differences, and served more as an exploratory method to assess the pattern of associations across specifications. The direct effect from trauma-type count → hoarding severity and the trauma-type count → self-criticism association showed some model-dependent variability (significant in some specifications, attenuated in others), which is unsurprising given the small comorbid subgroup.

SRMR = 0.017. Considering direct effects, total trauma exposure was not significantly associated with self-criticism ($b = 1.74$, 95% CI [-0.31, 3.78], $z = 1.66$, $p = 0.097$), however, it was significantly associated with posttraumatic stress symptom severity ($b = 2.41$, 95% CI [0.92, 3.89], $z = 3.18$, $p = 0.001$). Self-criticism was significantly associated with shame ($b = 0.17$, 95% CI [0.13, 0.21], $z = 8.34$, $p < 0.001$), however, self-criticism was not significantly associated with post-traumatic stress symptom severity ($b = -0.14$, 95% CI [-0.44, 0.17], $z = -0.891$, $p = 0.373$). Finally, shame was significantly associated with post-traumatic stress symptom severity ($b = 0.95$, 95% CI [0.01, 1.90], $z = 1.975$, $p = 0.048$). Two indirect effect pathways were also examined. First, the indirect effect of total trauma exposures on posttraumatic stress symptom severity serially mediated through self-criticism and shame as estimated, $b = 0.28$, 95% bootstrap (10,000 respamples) BC CI [-0.03, 1.11]. Second, an indirect effect of total trauma exposure on posttraumatic stress symptom severity mediated through self-criticism (but not shame) was estimated as $b = -0.24$, 95% bootstrap (10,000 respamples) BC CI [-1.54, 0.21]. The total effect of the model was estimated at $b = 2.45$, 95% bootstrap (10,000 respamples) BC CI [0.84, 4.15]. The estimated model, along with standardized effects, is displayed in Figure 2.

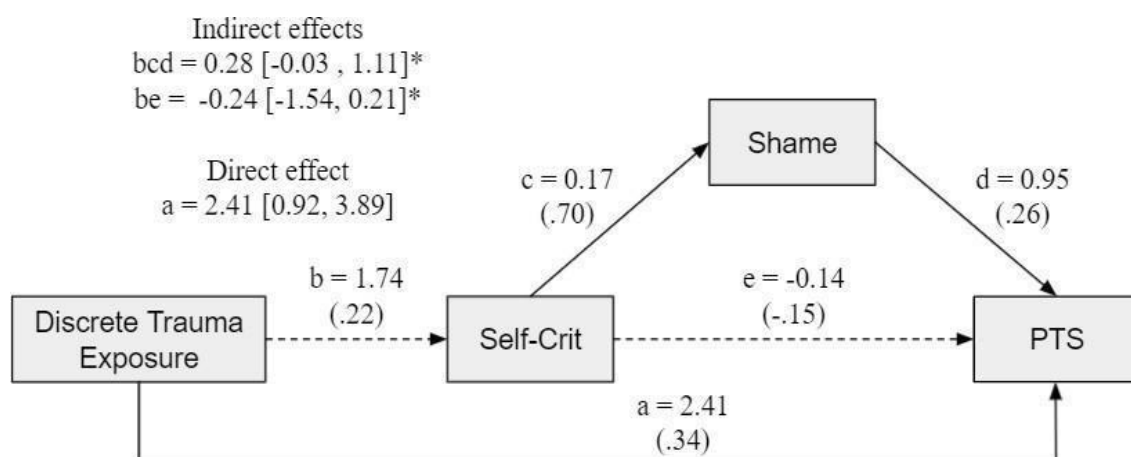


Figure 2 PTS Path model figure. Note. Solid lines indicate significant direct effects, broken lines indicate non-significance. * = BC bootstrapped 95% confidence intervals. Standardized regression coefficients are contained in ().

4. Discussion

To explore the role of self-related constructs in different traumatized populations, the current study examined self-criticism, shame, and treatment-specific psychiatric symptom severity among two clinical samples with significant trauma exposure. In exploring the characteristics of the samples, we found that the hoarding sample is significantly older. This is consistent with literature suggesting that symptom recognition and treatment-seeking tend to start later in life among people experiencing HD [27]. The trauma sample had more co-occurring diagnoses. This may be related to the acute nature of the violent crime that brought the individuals in the trauma sample to therapy. In terms of trauma exposure, different from our hypothesis, the hoarding and trauma samples had similar rates of trauma exposure to direct interpersonal violence and sudden death of a close other. On the other hand, the hoarding sample had greater exposure to natural disasters, transportation accidents, and witnessing death or severe injury. The former highlights the strong association

between trauma and hoarding, specifically that the trauma exposure rate in this population is not second to other clinical samples [26]. The latter may partly be a function of age in which the hoarding sample had more lifetime to experience natural and accidental events. In addition, the HD participants were recruited from a hoarding treatment trial (rather than a recent-victimization clinic), whereas the trauma sample was recruited for acute violent crime exposure; differences in sampling frame and time since trauma likely contributed to the pattern of higher lifetime trauma counts in HD but higher current posttraumatic stress in the trauma clinic sample.

In our examination of the relations between shame, self-criticism, and their effects on the relations between trauma and psychopathology, first, we found that the hoarding sample reported significantly more shame and self-criticism than the trauma sample. This finding echoes previous studies highlighting the significant issues of shame and harsh self-attitudes among individuals experiencing hoarding (e.g., [30]). Moreover, examined in the context of exposure to trauma, the extent of shame and self-criticism in the HD population stood out compared with those seeking treatment for trauma: While it is common for trauma survivors to blame themselves for their experiences and symptoms, and feel shame associated with or as a result of trauma; it seems even more common for those experiencing hoarding to express shame, self-criticisms or self-hate – both related to and apart from the hoarding issue.

Second, we hypothesized that, for both samples, greater trauma exposure would be associated with greater self-related difficulties, and greater self-related difficulties would be associated with more severe psychiatric symptoms. Interestingly, only in the hoarding sample was the extent of trauma exposure related to increased self-criticism. Similarly, only in the hoarding sample was increased shame related to symptom severity. Furthermore, path analysis found that, in the trauma sample, there is a direct relation between total trauma exposure and posttraumatic stress severity. Whereas, in the hoarding sample, there is a significant indirect pathway from total trauma exposure to self-criticism, to shame, and then to hoarding symptom severity. This means that while trauma contributes to posttraumatic stress more directly in the trauma sample, contrastingly, trauma is indirectly related to hoarding severity through self-related difficulties. We note that the cross-sectional data collected in the current study does not suggest causal relations. Nevertheless, the findings suggest a significant and unique role of self-criticism and shame between trauma and hoarding: among this group of people who developed HD, the self-related attitude and feelings seem to be more susceptible to trauma, and such vulnerability seems to be related to saving and excessive acquisition of physical objects. Echoing previous studies [30, 32], this result suggests a function of saving behaviors as providing relief of, or compensation for, feelings from self-criticism and shame. This is consistent with our clinical observation of clients reporting the feelings that, for example, owning certain items provides evidence of their worth or makes one feel better about oneself; keeping things prevents them from potential harsh self-blame later on if they regret discarding them.

The study was conducted with curiosity to explore factors related to different mental health outcomes, such as TSRDs vs. HD, when they have significant exposure to trauma. One possible account drawn from the current study is that hoarding behaviors may function as safety behaviors that temporarily dampen re-experiencing and hyperarousal—thereby lowering the likelihood of meeting PTSD thresholds—even as distress is redirected into saving/acquiring and difficulty discarding. In cognitive-behavioral models, acquiring and saving are negatively reinforced because they reduce distress and increase perceived safety/control; possessions may also take on self-

protective and identity-affirming roles (e.g., [31, 32, 61, 62]). Framed within multifinality, similar trauma exposures could thus yield divergent phenotypes—direct posttraumatic stress for some individuals versus an indirect path through self-criticism and shame to hoarding severity for others—which is consistent with the serial indirect effect observed here.

Overall, findings of the current study highlight the underlying effect of trauma, and more importantly, the significant and unique role of self-criticism and shame in the pathology of HD. They echo a growing body of research suggesting that issues with the self, such as ambivalence about self-worth, seeing objects as an extension of the self, may have contributed to increased attachment and a heightened sense of responsibility to physical possessions [31, 32, 62]. Clinically, we observe individuals with HD feeling undeserving of using their nice possessions, and yet having difficulties giving them away or stopping acquiring because having the items makes them feel better or comforted. On the other hand, we also observe individuals experiencing guilt considering discarding items they do not enjoy, because they feel responsible to salvage any amount of value or potential of the items, regardless of the cost of time, energy, and space. It is with these clinical observations and research evidence, the Compassion Focused Therapy approach for HD (CFT-HD; [63, 64]) has been developed.

CFT-HD is a trauma-sensitive approach tailoring Compassion Focused Therapy (CFT; [65]) to work with hoarding by addressing some of its roots, including self-related issues. Part of the CFT psycho-education [65] introduces the capabilities and flaws of the human brain as a product of evolution, as well as how humans are shaped by genetic, environmental, and life experiences they do not choose. In our clinical observation, this has served to relieve the shame and self-criticism individuals have endured because of their hoarding issues and help them understand how challenging life experiences, including trauma, have played a role in their current difficulties. Furthermore, the compassionate orientation of CFT, its methods and tools, such as compassion imagery, work with the inner critical voice and fears, blocks and resistance of compassion, as well as building a compassionate-self, have helped individuals suffering with hoarding and shame understand and relate to themselves in a more supportive way. These methods have reshaped clients' relationship with themselves and the difficulties they experience. As a newer intervention for HD, Group CFT-HD has been found to yield clinically meaningful symptom reduction as a follow-up treatment for people who had completed Group Cognitive Behavioral Therapy for HD but remained significantly symptomatic [63]. As a stand-alone treatment for HD, Group CFT-HD has also shown clinically significant symptom reduction (manuscript in preparation). The next step of this line of research should examine the effect of CFT on specific treatment targets, such as self-related issues discussed above, to clarify the pathways through which CFT reduces HD symptoms.

This is the first known study to investigate the unique roles of self-criticism and shame on treatment-specific psychiatric symptom severity among two clinical samples in treatment for different diagnoses but with similar histories of significant trauma. The study benefited from examining unique clinical samples; however, it is not without limitations. Since recruitment of the samples took place before and during the transition from the *DSM-IV-TR* to the *DSM-5*, some diagnoses reported in this study do not represent the most up-to-date clinical criteria but do serve as estimates. Unfortunately, HD was not assessed in the trauma sample; therefore, the prevalence of it in this particular population is unknown. Relatedly, there was no overlap in the assessment of the treatment-specific psychiatric symptoms between the samples in this study. This precluded our ability to cross-examine relations between these psychiatric symptoms with trauma and self-related

measures across samples. Different measures of trauma were used to assess trauma exposure in the two samples. We tried to control for any differences by only comparing the same types of trauma between these measures.

A more consistent and comprehensive assessment of trauma exposure would be recommended for future studies. Also, prospective studies that measure time since trauma, trauma type, safety signaling, and self-related processes (shame, self-criticism) are needed to test whether hoarding-related safety behaviors truly buffer PTSD risk versus reorganize how trauma-related distress is expressed. Another useful next step is to test whether maladaptive self-related processes (e.g., self-criticism, shame, low self-compassion) or social/interpersonal processes (e.g., loneliness, diminished support, family accommodation/conflict) are stronger predictors of hoarding severity—and whether their effects are additive or interactive. Designs that measure both classes of mechanisms and model them simultaneously can clarify which targets carry the greatest explanatory weight. Such work would integrate compensatory models centered on interpersonal processes with evidence here that internal self-processes are robust pathways, refining mechanism-focused, trauma-informed interventions for HD.

Author Contributions

Dr. Chou co-conceptualized the focus of the paper, assisted with recruitment of the hoarding disorder (HD) sample, and co-wrote and critically edited multiple drafts of the manuscript. Dr. Valdez co-conceptualized the focus of the paper, assisted with recruitment of the trauma sample, and co-wrote and critically edited multiple drafts of the manuscript. Trevor Stevens conducted the data analyses and contributed to writing the analytic approach and Results sections. Dr. Mathews supervised the hoarding sample study and provided critical review and editorial revisions to manuscript drafts. Dr. Shumway supervised the trauma sample study and provided critical review and editorial revisions to manuscript drafts.

Funding

This research was supported in part by grants from the National Institute on Aging of the National Institutes of Health to the first author under award numbers P30A120275 and P30AG044281, and by a Patient-Centered Outcomes Research Institute (PCORI) Assessment of Prevention, Diagnosis, and Treatment Options Program Award (number CE-1304-6000) to CM.

Competing Interests

The authors have declared that no competing interests exist. The funder had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript or decision to submit the manuscript for publication. All statements in this report, including its findings and conclusions, are solely those of the authors and do not necessarily represent the views of PCORI, its Board of Governors, or the Methodology Committee.

References

1. Kilpatrick DG, Resnick HS, Milanak ME, Miller MW, Keyes KM, Friedman MJ. National estimates of exposure to traumatic events and PTSD prevalence using *DSM-IV* and *DSM-5* criteria. *J Trauma Stress*. 2013; 26: 537-547.
2. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders: DSM-5*. 5th ed. Washington, D.C.: American Psychiatric Association; 2013.
3. Gradus JL. Prevalence and prognosis of stress disorders: A review of the epidemiologic literature. *Clin Epidemiol*. 2017; 9: 251-260.
4. McChesney GC, Adamson G, Shevlin M. Service use patterns and mental health symptoms among adolescents exposed to multiple types of trauma. *J Adolesc*. 2015; 40: 1-10.
5. Schlaudt VA, Bosson R, Williams MT, German B, Hooper LM, Frazier V, et al. Traumatic experiences and mental health risk for refugees. *Int J Environ Res Public Health*. 2020; 17: 1943.
6. Trivedi RB, Post EP, Sun H, Pomerantz A, Saxon AJ, Piette JD, et al. Prevalence, comorbidity, and prognosis of mental health among US veterans. *Am J Public Health*. 2015; 105: 2564-2569.
7. Aas M, Henry C, Andreassen OA, Bellivier F, Melle I, Etain B. The role of childhood trauma in bipolar disorders. *Int J Bipolar Disord*. 2016; 4: 2.
8. Barrigón ML, Diaz FJ, Gurpegui M, Ferrin M, Salcedo MD, Moreno-Granados J, et al. Childhood trauma as a risk factor for psychosis: A sib-pair study. *J Psychiatr Res*. 2015; 70: 130-136.
9. Mandavia A, Robinson GG, Bradley B, Ressler KJ, Powers A. Exposure to childhood abuse and later substance use: Indirect effects of emotion dysregulation and exposure to trauma. *J Trauma Stress*. 2016; 29: 422-429.
10. Mandelli L, Petrelli C, Serretti A. The role of specific early trauma in adult depression: A meta-analysis of published literature. *Childhood trauma and adult depression*. *Eur Psychiatry*. 2015; 30: 665-680.
11. Pinciotti CM, Riemann BC, Wetterneck CT. Trauma type and obsessive-compulsive symptom domains: The unique relationship between indirectly experienced trauma and just right symptoms. *J Obsessive Compuls Relat Disord*. 2021; 29: 100624.
12. Przeworski A, Cain N, Dunbeck K. Traumatic life events in individuals with hoarding symptoms, obsessive-compulsive symptoms, and comorbid obsessive-compulsive and hoarding symptoms. *J Obsessive Compuls Relat Disord*. 2014; 3: 52-59.
13. Cicchetti D, Rogosch FA. Equifinality and multifinality in developmental psychopathology. *Dev Psychopathol*. 1996; 8: 597-600.
14. Masten AS, Cicchetti D. Developmental cascades. *Dev Psychopathol*. 2010; 22: 491-495.
15. Capone C, Norman SB, Haller M, Davis B, Shea MT, Browne K, et al. Trauma Informed Guilt Reduction (TriGR) therapy for guilt, shame, and moral injury resulting from trauma: Rationale, design, and methodology of a two-site randomized controlled trial. *Contemp Clin Trials*. 2021; 101: 106251.
16. DeCou CR, Mahoney CT, Kaplan SP, Lynch SM. Coping self-efficacy and trauma-related shame mediate the association between negative social reactions to sexual assault and PTSD symptoms. *Psychol Trauma*. 2019; 11: 51-54.
17. Kline NK, Berke DS, Rhodes CA, Steenkamp MM, Litz BT. Self-blame and PTSD following sexual assault: A longitudinal analysis. *J Interpers Violence*. 2021; 36: NP3153-NP3168.

18. Schimmenti A. Unveiling the hidden self: Developmental trauma and pathological shame. *Psychodyn Pract.* 2012; 18: 195-211.
19. Symonds M. The “second injury” to victims of violent acts. *Am J Psychoanal.* 2010; 70: 34-41.
20. Cox BJ, MacPherson PS, Enns MW, McWilliams LA. Neuroticism and self-criticism associated with posttraumatic stress disorder in a nationally representative sample. *Behav Res Ther.* 2004; 42: 105-114.
21. Dorresteijn S, Gladwin TE, Eekhout I, Vermetten E, Geuze E. Childhood trauma and the role of self-blame on psychological well-being after deployment in male veterans. *Eur J Psychotraumatol.* 2019; 10: 1558705.
22. Kealy D, Rice SM, Ogrodniczuk JS, Spidel A. Childhood trauma and somatic symptoms among psychiatric outpatients: Investigating the role of shame and guilt. *Psychiatry Res.* 2018; 268: 169-174.
23. Bortolon C, Raffard S. Affective and cognitive factors associated with hallucination proneness in the general population: The role of shame and trauma-related intrusions. *Cogn Neuropsychiatry.* 2019; 24: 406-420.
24. Winders SJ, Murphy O, Looney K, O'Reilly G. Self-compassion, trauma, and posttraumatic stress disorder: A systematic review. *Clin Psychol Psychother.* 2020; 27: 300-329.
25. Kaurin A, Schönfelder S, Wessa M. Self-compassion buffers the link between self-criticism and depression in trauma-exposed firefighters. *J Couns Psychol.* 2018; 65: 453-462.
26. Chou CY, Tsoh JY, Smith LC, Bain LD, Botcheva L, Chan E, et al. How is hoarding related to trauma? A detailed examination on different aspects of hoarding and age when hoarding started. *J Obsessive Compuls Relat Disord.* 2018; 16: 81-87.
27. Grisham JR, Frost RO, Steketee G, Kim HJ, Hood S. Age of onset of compulsive hoarding. *J Anxiety Disord.* 2006; 20: 675-686.
28. Landau D, Iervolino AC, Pertusa A, Santo S, Singh S, Mataix-Cols D. Stressful life events and material deprivation in hoarding disorder. *J Anxiety Disord.* 2011; 25: 192-202.
29. Shaw AM, Witcraft SM, Timpano KR. The relationship between traumatic life events and hoarding symptoms: A multi-method approach. *Cognit Behav Ther.* 2016; 45: 49-59.
30. Chou CY, Tsoh J, Vigil O, Bain D, Uhm SY, Howell G, et al. Contributions of self-criticism and shame to hoarding. *Psychiatry Res.* 2018; 262: 488-493.
31. Frost RO, Kyrios M, McCarthy K, Matthews Y. Self-ambivalence and attachment to possessions. *J Cogn Psychother.* 2007; 21: 232-242.
32. Kings CA, Moulding R, Knight T. You are what you own: Reviewing the link between possessions, emotional attachment, and the self-concept in hoarding disorder. *J Obsessive Compuls Relat Disord.* 2017; 14: 51-58.
33. Mathews CA, Mackin RS, Chou CY, Uhm SY, Bain LD, Stark SJ, et al. Randomised clinical trial of community-based peer-led and psychologist-led group treatment for hoarding disorder. *BJPsych Open.* 2018; 4: 285-293.
34. Frost RO, Steketee G, Grisham J. Measurement of compulsive hoarding: Saving inventory-revised. *Behav Res Ther.* 2004; 42: 1163-1182.
35. Saxena S, Ayers CR, Dozier ME, Maidment KM. The UCLA hoarding severity scale: Development and validation. *J Affect Disord.* 2015; 175: 488-493.
36. Frost RO, Steketee G, Tolin DF, Renaud S. Development and validation of the clutter image rating. *J Psychopathol Behav Assess.* 2008; 30: 193-203.

37. Valdez CE, London MJ, Gregorich SE, Lilly MM. Development and validation of the Trauma-Related Cognitions Scale. *PLoS One*. 2021; 16: e0250221.
38. Gershuny BS. Structural models of psychological trauma, dissociative phenomena, and distress in a mixed-trauma sample of females: Relations to fears about death and control. Columbia, MO: University of Missouri-Columbia; 1999.
39. Carlson EB, Smith SR, Palmieri PA, Dalenberg C, Ruzek JI, Kimerling R, et al. Development and validation of a brief self-report measure of trauma exposure: The trauma history screen. *Psychol Assess*. 2011; 23: 463-477.
40. Nordsletten A, de la Cruz LF, Pertusa A, Reichenberg A, Hatch S, Mataix-Cols D. The structured interview for hoarding disorder (SIHD): Development, usage and further validation. *J Obsessive Compuls Relat Disord*. 2013; 2: 346-350.
41. Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, et al. The mini-international neuropsychiatric interview (MINI): The development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *J Clin Psychiatry*. 1998; 59: 22-33.
42. Kellman-McFarlane K, Stewart B, Woody S, Ayers C, Dozier M, Frost RO, et al. Saving inventory-revised: Psychometric performance across the lifespan. *J Affect Disord*. 2019; 252: 358-364.
43. Weathers FW, Litz BT, Keane TM, Palmieri PA, Marx BP, Schnurr PP. The PTSD checklist for DSM-5 (PCL-5) [Internet]. White River Junction, VT: National Center for PTSD; 2013. Available from: <https://www.ptsd.va.gov/professional/assessment/adult-sr/ptsd-checklist.asp>.
44. Wortmann JH, Jordan AH, Weathers FW, Resick PA, Dondanville KA, Hall-Clark B, et al. Psychometric analysis of the PTSD Checklist-5 (PCL-5) among treatment-seeking military service members. *Psychol Assess*. 2016; 28: 1392-1403.
45. Blevins CA, Weathers FW, Davis MT, Witte TK, Domino JL. The posttraumatic stress disorder checklist for DSM-5 (PCL-5): Development and initial psychometric evaluation. *J Psychiatr Res*. 2015; 28: 489-498.
46. Gilbert P, Clarke M, Hempel S, Miles JN, Irons C. Criticizing and reassuring oneself: An exploration of forms, styles and reasons in female students. *Br J Clin Psychol*. 2004; 43: 31-50.
47. Baião R, Gilbert P, McEwan K, Carvalho S. Forms of self-criticising/attacking & self-reassuring scale: Psychometric properties and normative study. *Psychol Psychother*. 2015; 88: 438-452.
48. Castilho P, Pinto-Gouveia J, Duarte J. Evaluating the multifactor structure of the long and short versions of the self-compassion scale in a clinical sample. *J Clin Psychol*. 2015; 71: 856-870.
49. Andrews B, Qian M, Valentine JD. Predicting depressive symptoms with a new measure of shame: The experience of shame scale. *Br J Clin Psychol*. 2002; 41: 29-42.
50. R Core Team. The R Project for Statistical Computing [Internet]. Vienna, Austria: R Core Team; 2021. Available from: <https://www.r-project.org/>.
51. Rosseel Y. lavaan: An R package for structural equation modeling. *J Stat Softw*. 2012; 48: 1-36.
52. Liu X. Linear mixed-effects models. In: *Methods and applications of longitudinal data analysis*. Amsterdam, Netherlands: Academic Press; 2016. pp. 61-94.
53. Holm S. A simple sequentially rejective multiple test procedure. *Scand J Stat*. 1979; 6: 65-70.
54. MacKinnon DP, Lockwood CM, Williams J. Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behav Res*. 2004; 39: 99-128.
55. Fritz MS, MacKinnon DP. Required sample size to detect the mediated effect. *Psychol Sci*. 2007; 18: 233-239.

56. Yuan KH, Bentler PM. 5. Three likelihood-based methods for mean and covariance structure analysis with nonnormal missing data. *Sociol Methodol.* 2000; 30: 165-200.
57. Mardia KV. Measures of multivariate skewness and kurtosis with applications. *Biometrika.* 1970; 57: 519-530.
58. Henze N, Zirkler B. A class of invariant consistent tests for multivariate normality. *Commun Stat Theory Methods.* 1990; 19: 3595-3617.
59. Korkmaz S, Goksuluk D, Zararsiz G. MVN: An R package for assessing multivariate normality. *R J.* 2014; 6: 151-162.
60. Finney SJ, DiStefano C. Non-normal and categorical data in structural equation modeling. In: *Structural equation modeling: A second course.* Charlotte, NC: Information Age Publishing; 2006. pp. 269-314.
61. Frost RO, Hartl TL. A cognitive-behavioral model of compulsive hoarding. *Behav Res Ther.* 1996; 34: 341-350.
62. Moulding R, Kings C, Knight T. The things that make us: Self and object attachment in hoarding and compulsive buying-shopping disorder. *Curr Opin Psychol.* 2021; 39: 100-104.
63. Chou CY, Tsoh JY, Shumway M, Smith LC, Chan J, Delucchi K, et al. Treating hoarding disorder with compassion-focused therapy: A pilot study examining treatment feasibility, acceptability, and exploring treatment effects. *Br J Clin Psychol.* 2020; 59: 1-21.
64. Chou CY, DuFrene T. A compassion-focused therapy approach for hoarding disorder: Background, introduction, and research update. *Psychologica.* 2021; 64: 109-130.
65. Gilbert P. *Compassion focused therapy: Distinctive features.* London, UK: Routledge; 2010.