Prevalence and Correlates of Difficulty Discarding: Results from a National Sample of the U.S. Population

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Abstract

Objectives—This study presents nationally representative data on the prevalence and correlates of difficulty discarding, a behavior described in many psychiatric disorders, including a new diagnosis in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, called hoarding disorder.

Methods—Data were derived from the National Epidemiologic Survey on Alcohol and Related Conditions, a national sample of the U.S. population (n= 43,093). Difficulty discarding worn-out/worthless items (assessed by a single item) and diagnoses of psychiatric disorders were based on the Alcohol Use Disorder and Associated Disabilities Interview Schedule.

Results—The prevalence of difficulty discarding worn-out/worthless items in the general population was 20.6%. Difficulty discarding strongly correlated with Axis I and Axis II disorders, level of impairment and use of mental health services.

Conclusions—Difficulty discarding worn-out/worthless items is a common behavior that *can be* associated with *various* forms of *psycho*pathology. *When reported in a clinical setting*, it *may* signal that careful assessment is needed to clarify diagnosis and inform treatment strategies.

Keywords

Difficulty Discarding; Hoarding Disorder; Epidemiology; Prevalence; NESARC

Introduction

Difficulty discarding possessions is a behavior that has been described in many psychiatric disorders, including obsessive compulsive personality disorder (OCPD), obsessive-compulsive disorder (OCD), schizophrenia, anorexia nervosa, dementia, depression, compulsive buying, and mental retardation (Frankenburg, 1984; Frost et al, 2000b; Greenberg et al, 1990; Hwang et al, 1998; Luchins et al, 1992; Mueller et al, 2007; Pertusa et al, 2010a; Samuels et al, 2002; Shafran et al, 1996; Steketee et al, 2003). Difficulty discarding is also a core feature of hoarding disorder (HD), a new diagnosis in the *DSM-5* (APA, 2013).

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Difficulty discarding behavior has been the focus of prior research. *Comparisons across these studies are challenging due to heterogeneous samples (e.g., hoarding, OCD, or community samples), assessment tools (e.g., Saving Inventory-Revised [SI-R], Yale-Brown Obsessive Compulsive Scale [YBOCS]), and diagnostic criteria (e.g., Hoarding Rating Scale [HRS], DSM-4). Several epidemiological studies have focused on prevalence rates of hoarding behavior (*Fullana et al, 2010; Iervolino et al, 2009; Mueller et al, 2009; Ruscio et al, 2010; Samuels et al, 2008; Timpano et al, 2011*); these studies have focused on hoarding behavior that is 'excessive' or 'pathological.' Other recent studies have used a difficulty discarding subscale of the SI-R (the most widely used self-report measure of hoarding) (*Frost et al, 2004*) to examine the phenomenology hoarding behaviors in specific samples: elderly (*Reid et al, 2011*), compulsive buying (*Mueller et al, 2007*), children with ADHD (*Hacker et al, 2012*), and those seeking treatment for anxiety disorders (*Tolin et al, 2011*).* None of these studies have examined the prevalence of difficulty discarding in a nationally representative sample of the U.S.

One prior study in a community based-sample (n=723) estimating the prevalence and correlates of difficulty discarding worn-out/worthless objects utilizing the DSM-4 OCPD hoarding criterion found a 5% prevalence (Samuels et al, 2008). The authors found this behavior to be more prevalent in older than younger age groups, and associated with multiple psychiatric disorders (Samuels et al, 2008). The participants sampled, however, were all residents of a single community (East Baltimore), and the study was therefore unable to provide information based on a representative U.S. population. In addition, only those individuals who were assessed to have pathological-level hoarding behavior on cross-examination were included in their final sample (Samuels et al, 2008); thus, only a subset of all individuals endorsing difficulty discarding was included their estimate of prevalence.

To evaluate how common difficulty discarding worn-out/worthless items is throughout the U.S., we used data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). The NESARC was created to address questions related to alcohol use disorders and a range of associated comorbid disorders. This dataset did not include questions related to OCD, but it did include a single item embedded within a personality assessment of OCPD which asked individuals (n=43,093) about their difficulty discarding possessions. The NESARC survey asked participants: "Do you have trouble throwing out worn-out or worthless things even if they don't have sentimental value?" We utilized this question in the present study to 1) estimate the prevalence and sociodemographic correlates of difficulty discarding worn-out/worthless items in the general population; 2) investigate the associated lifetime prevalence of psychiatric disorders associated with difficulty discarding worn-out/worthless items; 3) assess the level of disability and impairment associated with difficulty discarding worn-out/worthless items; and 4) estimate lifetime and 12-month rates of mental health treatment-seeking among individuals with difficulty discarding worn-out/worthless items.

Methods

Sample

The 2001–2002 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) was conducted by the US Census Bureau under the direction of the National Institute of Alcoholism and Alcohol Abuse (NIAAA). Its detailed methodology and procedures are described elsewhere (Grant et al, 2003a; Grant et al, 2004b). The research protocol, including informed consent procedures, received human subjects review and approval from the U.S. Census Bureau and the U.S. Office of Management and Budget.

The NESARC targeted the civilian, non-institutionalized population, 18 years and older, residing in households in the 50 states and in the District of Columbia. Overall survey response rate was 81%. The final sample included 43,093 respondents drawn from individual households and group quarters. African Americans, Latinos, and young adults (aged 18 to 24 years) were oversampled, with data adjusted for oversampling and household- and person-level nonresponse. The weighted data were then adjusted using the 2000 Decennial Census to be representative of the US civilian population across a broad range of sociodemographic variables.

Diagnostic Assessment

Sociodemographic measures included gender, race-ethnicity, nativity, age, marital status, and urbanicity. Socioeconomic measures included education and personal income.

The psychiatric diagnoses on Axis I and Axis II were assessed using the NIAAA Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM-4 Version (AUDADIS-IV). The Axis I diagnoses fall into three groups: 1) Substance Use Disorders (any alcohol abuse and dependence, drug abuse and dependence, and nicotine dependence); 2) Mood Disorders (major depressive disorder, dysthymic disorder, and bipolar disorder); and 3) Anxiety Disorders (panic disorder, social anxiety disorder, specific phobia, and generalized anxiety disorder). The Axis II diagnoses included: avoidant, dependent, paranoid, schizoid, histrionic, antisocial, and obsessive compulsive personality disorders. Several studies have tested the diagnostic reliability of AUDADIS-IV measures for DSM-4 Axis I and Axis II disorders. Reliability ranged from "moderate" to "almost perfect" (Landis et al, 1977) for substance use disorders ($\kappa = 0.54$–0.91) (Canino et al, 1999; Cottler et al, 1997a; Grant et al, 2003b; Grant et al, 1995b), from "moderate" to "substantial" for mood disorders ($\kappa = 0.58$–0.73)(Canino et al, 1999; Cottler et al, 1997b; Grant et al, 2003c; Grant et al, 1995a), and from "fair" to "substantial" for Anxiety disorders ($\kappa = 0.40$–0.77) (Grant et al, 2003b, Ruan et al, 2008) and Axis II disorders ($\kappa = 0.40$–0.71) (Grant et al, 2003b, Ruan et al, 2008).

Diagnoses required long term patterns of social and occupational impairment, and exclusion of substance-induced cases (Grant et al, 2004a). In the NESARC, OCD was not assessed.

Embedded within the OCPD section of the NESARC was the question: "Do you have trouble throwing out worn-out or worthless things even if they have no sentimental value?" which was used to determine who did and did not have difficulty discarding. While the test-retest reliability of individual items is unavailable, the computed Cronbach's alpha for the OCPD symptom section was 0.6; this value did not change with exclusion of the difficulty discarding item.

The NESARC interview used the Short Form-12 Health Survey, version 2 (SF-12v2) a set of scales assessing various dimensions of mental disability and impairment. The SF-12v2 is a reliable measure (ICC = 0.63–0.92) of current disability widely used in population surveys (Amir et al, 2002; Salyers et al, 2000; Ware et al, 1996). The SF-12v2 is comprised of the following scales: the physical component summary score; the mental component summary score; the social functioning score, reflecting limitations in social functioning due to physical or emotional problems; the role emotional function score, measuring role impairment due to emotional problems; and the mental health score, reflecting general mental health functioning. Standard norm-based scoring techniques were used to transform each score to achieve a mean of 50 and a standard deviation of 10 in the general population.

Finally, to estimate rates of mental health service utilization, respondents were classified as receiving treatment if they sought help from a counselor, therapist, doctor, or psychologist or from an emergency room; if they reported being hospitalized for a psychiatric disorder at

least one night; or if they reported being prescribed medications for a psychological problem.

Statistical analyses

Weighted percentages and means were computed to derive sociodemographic and clinical characteristics of respondents with and without difficulty discarding worn-out/worthless items. Standard errors and 95% confidence intervals (CIs) for all analyses were estimated using SUDAAN, (Research Triangle Institute, 2004) to adjust for the complex design of the NESARC. Logistic regressions were conducted to compare individuals with and without difficulty discarding worn-out/worthless items on sociodemographic variables. Logistic regression was also used to compare those with and without history of difficulty discarding worn-out/worthless items adjusting for both key sociodemographic variables and the presence of other psychiatric disorders. Odds ratios (ORs) whose CIs do not include 1 were considered significant (Agresti, 2002).

Results

Overall Prevalence

The prevalence of difficulty discarding worn-out/worthless items in the general population was 20.6% (95% CI: 19.6%–21.7%).

Sociodemographic Characteristics (Table 1)

Table 1 shows the prevalence and sociodemographic characteristics of individuals with and without difficulty discarding worn-out/worthless items. Rates of difficulty discarding worn-out/worthless items did not significantly differ by gender. Being Native/American, US-born, older than 45, high school educated, widowed, separated, or divorced, and living in a rural community increased the likelihood of having difficulty discarding worn-out/worthless items. Being Black, Asian, Hispanic, earning >$35,000, and being never married decreased the likelihood of having difficulty discarding worn-out/worthless items.

Lifetime Prevalence of Psychiatric Disorders (Table 2)

A larger percentage of individuals who reported difficulty discarding worn-out/worthless items had a lifetime psychiatric disorder compared to individuals without difficulty discarding worn-out/worthless items (70.2% vs. 50.0%, OR: 2.56). Individuals with difficulty discarding worn-out/worthless items were significantly more likely to have a lifetime Axis I disorder than individuals without difficulty discarding worn-out/worthless items (64.9% vs. 48.4%, OR 1.59). They were also significantly more likely to have an Axis II disorder (31.6% vs. 11.0%, OR 3.61).

The most common Axis I psychiatric disorders in individuals who endorsed difficulty discarding worn-out/worthless items in descending order of prevalence were nicotine dependence (23%), alcohol abuse (21%), major depression (18%), alcohol dependence (17%), specific phobia (15%), and social phobia (10%). The most common Axis II psychiatric disorders in individuals who endorsed difficulty discarding in descending order were OCPD (22%), paranoid (9%), schizoid (6%), antisocial (6%), and avoidant (5%).

Within both the Axis I and Axis II disorders, the strongest association with difficulty discarding worn-out/worthless items was OCPD; this association remained, even when the difficulty discarding criteria was removed from the assessment of OCPD (OR 2.98).

Social Functioning and Mental Health (Table 3)

Difficulty discarding worn-out/worthless items was a highly significant (p <0.003-p < 0.00001) predictor of lower physical component summary, mental component summary, social functioning, role emotional function, and mental health scores. Respondents endorsing difficulty discarding worn-out/worthless items had significantly greater average disability and dysfunction than respondents who did not endorse difficulty discarding worn-out/worthless items.

Treatment-Seeking (Table 4)

Individuals with difficulty discarding worn-out/worthless items reported significantly higher rates of mental health treatment seeking than other respondents across all treatment settings and regardless of time frame (lifetime: 27.0% vs. 17.1%, OR 1.78; past year: 1.5% vs. 0.9%, OR 1.63). The likelihood of lifetime history of psychiatric hospitalizations, emergency visits, and inpatient treatment in individuals with difficulty discarding worn-out/worthless items was nearly double that of individuals without this behavior.

Discussion

This is the first study to examine the prevalence and characteristics of difficulty discarding worn-out/worthless items (even if they do not have sentimental value) in a nationally representative population. We found the prevalence of difficulty discarding worn-out/ worthless items in the general population to be 20.6%, with increased likelihood in older versus younger age groups. Difficulty discarding was associated with increased rates of psychiatric disorders and higher levels of disability and impairment relative to those without difficulty discarding. Approximately a quarter of the individuals with difficulty discarding reported using mental health services in their lives.

That over 20% of Americans endorsed difficulty discarding worn-out/worthless items (even if they do not have sentimental value) was a surprise, as this rate is at least threefold higher than prior epidemiological studies estimating the prevalence of pathological hoarding behavior to be 2–6% (Fullana et al, 2010; Iervolino et al, 2009; Mueller et al, 2009; Ruscio et al, 2010; Samuels et al, 2008; Timpano et al, 2011). This difference is likely due to the fact that these other studies (e.g., Samuels et al) focused on what is pathological, with each study utilizing different diagnostic criteria and assessment tools for assessing pathological hoarding behavior, whereas we focused on the entire spectrum of individuals endorsing difficulty discarding worn-out/worthless items available in the NESARC.

Our data shows that difficulty discarding worn-out/worthless items, in and of itself, is associated with older rather than younger age groups, rural rather than urban living, and higher income. *Our data did not show differences in gender.* That difficulty discarding worn-out/worthless items is associated with higher likelihood in older than younger age groups is consistent with prior descriptions of pathological hoarding behaviors in the elderly (Kim et al, 2001; Reid et al, 2011; Sorrell, 2012) and results from a prior study utilizing the same single item question embedded in the assessment of OCPD (Samuels et al, 2008). *However, other epidemiological studies using varied assessments of hoarding behaviors did not find an age difference (*Fullana et al, 2010; Mueller et al, 2009; Timpano et al, 2011*). Differences in sampling may account for these discrepancies.* The finding of increased likelihood in rural settings was unexpected; hoarding behaviors itself has been hypothesized to be more common in urban communities where space constraints are different than in rural communities (Mataix-Cols et al, 2010). The *decreased* likelihood of higher income in those with difficulty discarding worn-out/worthless items is also interesting. *Higher income may afford individuals a larger area of living space, thus decreasing the need to discard. We did*

*not find significant gender differences in individuals with difficulty discarding; however, the epidemiologic studies examining sex differences in hoarding disorder have been mixed, with some studies finding greater prevalence in males (*Iervolino et al, 2009; Samuels et al, 2008*) and others finding no differences (*Fullana et al, 2010; Mueller et al, 2009; Timpano et al, 2011*). Heterogeneity in diagnostic criteria, assessment measures, and sampling may account for these differences.*

Our data also suggest that difficulty discarding worn-out/worthless items, in and of itself, is associated with high rates of psychiatric disorders, psychosocial impairment, and mental service use. We found high rates of Axis I (65%) and Axis II (33%) disorders in individuals who endorsed difficulty discarding worn-out/worthless items. These results are consistent with a prior study of comorbidity in hoarding disorder that showed nearly 75% of individuals with hoarding disorder had a mood and/or anxiety disorder (Frost et al, 2011b). *Our data suggests that* nicotine dependence (23%) and alcohol abuse (21%) and alcohol dependence (17%) were common in individuals endorsing difficulty discarding worn-out/ worthless item. *Interestingly, a* prior study also found significantly higher rates of substance use disorders in *females diagnosed with OCD* who also had hoarding behaviors versus those *females diagnosed with OCD* without *hoarding behaviors* (Wheaton et al, 2008). *On the other hand, a subsequent epidemiological study in a community sample found that men and women had a similar magnitude of association between hoarding and alcohol dependence (*Samuels et al, 2008*). In addition, a study of pathological hoarding behaviors in a compulsive buying population found no significant differences between lifetime substance use disorder in hoarding and non-hoarding compulsive buyers(*Mueller et al, 2007*). Differences in sampling (e.g., OCD, community, compulsive buying) may account for these discrepancies.*

In our study, the highest rate of an Axis II disorder was OCPD, and even with the difficulty discarding criteria removed, the rate was 14% (OR=2.98); high rates of OCPD have also been found in pathological hoarding (Frost et al, 2011b; Samuels et al, 2008).

Our study identified higher rates of lifetime and past year treatment utilization across a broad range of service settings in individuals with difficulty discarding worn-out/worthless items compared to those without this behavior. At the same time, only 27% of individuals who endorsed difficulty discarding sought mental health treatment. Clients with pathological hoarding behaviors also do not often seek mental health treatment, but instead they come to the attention of non-mental health agencies (e.g., fire department, police) during emergencies (e.g., pest infestation, fire, eviction) (Frost et al, 2000a; Rodriguez et al, 2010; Rodriguez et al, 2012; Tolin et al, 2008), and if they do seek mental health treatment, it is often for the treatment of comorbidities (Frost et al, 2011b). Public health initiatives that encourage help for individuals who report distress or functional impairment due to difficulty discarding may promote early identification of individuals with hoarding disorder.

Taken together, our results on the prevalence and correlates of difficulty discarding of worn-out/worthless items (even if they do not have sentimental value) have important clinical implications. Our findings suggest difficulty discarding is *quite a common behavior that can be* associated with *various forms of* pathology. *When reported in a clinical setting, it may* signal that careful clinical assessment is needed to clarify diagnosis (Mataix-Cols et al, 2010) and treatment strategies (Frost et al, 2011a; Muroff et al, 2012; Saxena, 2008; Saxena, 2011; Saxena et al, 2007; Steketee et al, 2010; Tolin et al, 2007). Our work also provides further empirical data to support what is already known clinically – difficulty discarding is only one component of hoarding pathology and further criteria are needed to distinguish normal from maladaptive behavior (Abramowitz et al, 2008; Damecour et al, 1998; Mataix-

Cols et al, 2010; Pertusa et al, 2010a; Pertusa et al, 2010b; Pertusa et al, 2008; Rachman et al, 2009; Saxena, 2007; Wheaton et al, 2008; Wu et al, 2005).

It is important to note that the DSM-4 OCPD hoarding criterion question/item we used to assesses difficulty discarding ("Do you have trouble throwing out worn-out or worthless things even if they don't have sentimental value?") is somewhat different from DSM-5 Criterion A, which characterizes difficulty discarding as "persistent difficulty discarding or parting with possessions, regardless of their actual value". First, DSM-5 criterion A includes individuals who have difficulty discarding object of any value, not just those that are worn-out/worthless. Second, the DSM-5 criterion A clarifies difficulty discarding as including parting with possessions (e.g., selling, donating, giving away) in addition to difficulty discarding them. Third, the sentimental value placed on items is one of the key difficulties that characterize the disorder and thus was not ruled out of this criterion (as was the case with the DSM-4 OCPD hoarding criterion). Two examples illustrate the differences between these two criteria: consider a patient who has no trouble discarding worn-out/worthless things, but who buys excessively and whose home is filled with many items never taken out of their packages, or a patient whose home is filled with what looks to the therapist as trash (scraps of paper, old tattered clothes, etc), but to which the person is emotionally (sentimentally) attached. Both of these are examples of individuals who meet the DSM-5 hoarding criterion A, but neither would meet the DSM-4 OCPD criterion.

The DSM-5 hoarding disorder criteria are comprised of criteria A to F to assess pathological levels of hoarding disorder, and these criteria have been recently tested in a London field trial and found to be reliable (Mataix-Cols et al, 2012). In addition to criterion A described above, the rest of the diagnostic criteria for HD in DSM-5 include that the difficulty discarding is due to a perceived need to save items and distress associated with discarding (criterion B), clutter (criterion C), and significant distress or impairment in important areas of functioning (criterion D). Furthermore, this behavior must not result from a general medical condition (criterion E) or another mental disorder (criterion F). The London field trial (Mataix-Cols et al, 2012) was the first test of these proposed HD criteria in *70 participants (50 individuals with prominent hoarding behavior and 20 self-defined collectors)* and found these criteria to be valid and reliable and suggested minor wording changes of the criteria. These criteria have been designed to distinguish normal from maladaptive hoarding behavior.

Determining the difference between normal and pathological behavior is important because not all individuals who endorse difficulty discarding behavior are considered 'excessive' or 'pathological; for example, some estimates suggest a large proportion of British adults (approximately 30%) engage in "collecting" (Mataix-Cols et al, 2012; Nordsletten et al, 2012). Collecting is not only widespread, but also a benign and highly pleasurable social activity. Yet, these items can be both worn out and worthless (i.e., have no monetary value) and yet have symbolic value or be of museum quality value, and an object can have value simply because it completes a collection (Mataix-Cols et al, 2012; Nordsletten et al, 2012). Thus, our sample includes an unknown number of individuals who will be totally healthy.

This study has both limitations that are common to all large-scale surveys and those that are study-specific. First, information was based on self-report. Second, because the NESARC sample only included civilian households and quarters populations, information on homeless individuals was unavailable. Third, longitudinal data are needed to examine the course of difficulty discarding to distinguish those individuals who engage in hoarding behavior versus those who go on to develop hoarding disorder. Fourth, this paper relies on a single item which assessed difficulty discarding of any severity. Future epidemiological studies will need to use DSM-5 criteria to determine the prevalence of hoarding disorder. This is

important to note since reluctance to discard possessions is well within the range of normal behavior (e.g., a large proportion of the population own collections and are understandably reluctant to get rid of them). Future epidemiological studies will need to use DSM-5 criteria to determine the prevalence of HD. This is important to note because reluctance to discard possessions is well within the range of normal behavior (e.g., a large proportion of the population owns collections and is understandably reluctant to get rid of them). Fifth, given that the NESARC did not collect information about OCD, we were unable to assess the question of whether difficulty discarding is more strongly associated with OCD than other mental disorders.

Conclusions

Our study illustrates that difficulty discarding worn-out/worthless items (even if they do not have sentimental value), *is a common phenomenon in the general U.S. population* and *may be* associated with high rates of psychiatric disorders, psychosocial impairment, and mental service use.

Acknowledgments

References

Abramowitz JS, Wheaton MG, Storch EA. The status of hoarding as a symptom of obsessive-compulsive disorder. Behav Res Ther. 2008; 46:1026–33. [PubMed: 18684434]

Agresti, A. Wiley Series in Probability and Statistics. 2. Hoboken, NJ: John Wiley & Sons, Inc; 2002. Categorical data analysis.

Amir M, Lewin-Epstein N, Becker G, Buskila D. Psychometric properties of the SF-12 (Hebrew version) in a primary care population in Israel. Medical care. 2002; 40:918–28. [PubMed: 12395025]

Canino G, Bravo M, Ramirez R, Febo VE, Rubio-Stipec M, Fernandez RL, Hasin D. The Spanish Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS): reliability and concordance with clinical diagnoses in a Hispanic population. J Stud Alcohol. 1999; 60:790–9. [PubMed: 10606491]

Cottler LB, Grant BF, Blaine J, Mavreas V, Pull C, Hasin D, Compton WM, Rubio-Stipec M, Mager D. Concordance of DSM-IV alcohol and drug use disorder criteria and diagnoses as measured by AUDADIS-ADR, CIDI and SCAN. Drug Alcohol Depend. 1997a; 47:195–205. [PubMed: 9306045]

Cottler LB, Grant BF, Blaine J, Mavreas V, Pull C, Hasin D, Compton WM, Rubio-Stipec M, Mager D. Concordance of DSM-IV alcohol and drug use disorder criteria and diagnoses as measured by AUDADIS-ADR, CIDI and SCAN. Drug Alcohol Depend. 1997b; 47:195–205. [PubMed: 9306045]

Damecour CL, Charron M. Hoarding: a symptom, not a syndrome. J Clin Psychiatry. 1998; 59:267–72. quiz 273. [PubMed: 9632043]

Frankenburg F. Hoarding in anorexia nervosa. British Journal of Medical Psychology. 1984; 57:57–60. [PubMed: 6704335]

Frost RO, Pekareva-Kochergina A, Maxner S. The effectiveness of a biblio-based support group for hoarding disorder. Behav Res Ther. 2011a; 49:628–34. [PubMed: 21831357]

Frost RO, Steketee G, Grisham J. Measurement of compulsive hoarding: saving inventory-revised. Behav Res Ther. 2004; 42:1163–82. [PubMed: 15350856]

Frost RO, Steketee G, Tolin DF. Comorbidity in hoarding disorder. Depress Anxiety. 2011b; 28:876–84. [PubMed: 21770000]

Frost RO, Steketee G, Williams L. Hoarding: a community health problem. Health Soc Care Community. 2000a; 8:229–234. [PubMed: 11560692]

Frost RO, Steketee G, Williams LF, Warren R. Mood, personality disorder symptoms and disability in obsessive compulsive hoarders: a comparison with clinical and nonclinical controls. Behav Res Ther. 2000b; 38:1071–81. [PubMed: 11060936]

Fullana MA, Vilagut G, Rojas-Farreras S, Mataix-Cols D, de Graaf R, Demyttenaere K, Haro JM, de Girolamo G, Lépine JP, Matschinger Hi, Alonso J. Obsessive-compulsive symptom dimensions in the general population: results from an epidemiological study in six European countries. Journal of Affective Disorders. 2010; 124:291–299. [PubMed: 20022382]

Grant, B.; Moore, T.; JS; Kaplan, K. N. I. o. A. A. a. Alcoholism. Source and Accuracy Statement: Wave 1 National Epidemiolgyc Survey on Alcohol and Related Conditions (NESARC). Vol. 2007. Bethesda, MD: 2003a.

Grant BF, Dawson DA, Stinson FS, Chou PS, Kay W, Pickering R. The Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV): reliability of alcohol consumption, tobacco use, family history of depression and psychiatric diagnostic modules in a general population sample. Drug Alcohol Depend. 2003b; 71:7–16. [PubMed: 12821201]

Grant BF, Dawson DA, Stinson FS, Chou PS, Kay W, Pickering R. The Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV): reliability of alcohol consumption, tobacco use, family history of depression and psychiatric diagnostic modules in a general population sample. Drug Alcohol Depend. 2003c; 71:7–16. [PubMed: 12821201]

Grant BF, Harford TC, Dawson DA, Chou PS, Pickering RP. The Alcohol Use Disorder and Associated Disabilities Interview schedule (AUDADIS): reliability of alcohol and drug modules in a general population sample. Drug Alcohol Depend. 1995a; 39:37–44. [PubMed: 7587973]

Grant BF, Harford TC, Dawson DA, Chou PS, Pickering RP. The Alcohol Use Disorder and Associated Disabilities Interview schedule (AUDADIS): reliability of alcohol and drug modules in a general population sample. Drug Alcohol Depend. 1995b; 39:37–44. [PubMed: 7587973]

Grant BF, Hasin DS, Stinson FS, Dawson DA, Chou SP, Ruan WJ, Pickering RP. Prevalence, correlates, and disability of personality disorders in the United States: results from the national epidemiologic survey on alcohol and related conditions. J Clin Psychiatry. 2004a; 65:948–58. [PubMed: 15291684]

Grant BF, Stinson FS, Dawson DA, Chou SP, Dufour MC, Compton W, Pickering RP, Kaplan K. Prevalence and co-occurrence of substance use disorders and independent mood and anxiety disorders: results from the National Epidemiologic Survey on Alcohol and Related Conditions. Arch Gen Psychiatry. 2004b; 61:807–816. [PubMed: 15289279]

Greenberg D, Witztum E, Levy A. Hoarding as a psychiatric symptom. J Clin Psychiatry. 1990; 51:417–21. [PubMed: 2211540]

Hacker LE, Park JM, Timpano KR, Cavitt MA, Alvaro JL, Lewin AB, Murphy TK, Storch EA. Hoarding in Children With ADHD. J Atten Disord. 2012

Hwang JP, Tsai SJ, Yang CH, Liu KM, Lirng JF. Hoarding behavior in dementia. A preliminary report. The American journal of geriatric psychiatry: official journal of the American Association for Geriatric Psychiatry. 1998; 6:285–9. [PubMed: 9793576]

Iervolino AC, Perroud N, Fullana MA, Guipponi M, Cherkas L, Collier DA, Mataix-Cols D. Prevalence and heritability of compulsive hoarding: a twin study. Am J Psychiatry. 2009; 166:1156–61. [PubMed: 19687130]

Kim HJ, Steketee G, Frost RO. Hoarding by elderly people. Health Soc Work. 2001; 26:176–84. [PubMed: 11531193]

Landis JR, Koch GG. The measurement of observer agreement for categorical data. Biometrics. 1977; 33:159–74. [PubMed: 843571]

Luchins DJ, Goldman MB, Lieb M, Hanrahan P. Repetitive behaviors in chronically institutionalized schizophrenic patients. Schizophr Res. 1992; 8:119–23. [PubMed: 1457389]

Mataix-Cols D, Billotti D, Fernandez de la Cruz L, Nordsletten AE. The London field trial for hoarding disorder. Psychological medicine. 2012:1–11.

Mataix-Cols D, Frost RO, Pertusa A, Clark LA, Saxena S, Leckman JF, Stein DJ, Matsunaga H, Wilhelm S. Hoarding disorder: a new diagnosis for DSM-V? Depress Anxiety. 2010; 27:556–72. [PubMed: 20336805]

Mueller A, Mitchell JE, Crosby RD, Glaesmer H, de Zwaan M. The prevalence of compulsive hoarding and its association with compulsive buying in a German population-based sample. Behav Res Ther. 2009; 47:705–9. [PubMed: 19457476]

Mueller A, Mueller U, Albert P, Mertens C, Silbermann A, Mitchell JE, de Zwaan M. Hoarding in a compulsive buying sample. Behav Res Ther. 2007; 45:2754–63. [PubMed: 17868641]

Muroff J, Steketee G, Bratiotis C, Ross A. Group cognitive and behavioral therapy and bibliotherapy for hoarding: a pilot trial. Depress Anxiety. 2012; 29:597–604. [PubMed: 22447579]

Nordsletten AE, Mataix-Cols D. Hoarding versus collecting: where does pathology diverge from play? Clin Psychol Rev. 2012; 32:165–76. [PubMed: 22322013]

Pertusa A, Frost RO, Fullana MA, Samuels J, Steketee G, Tolin D, Saxena S, Leckman JF, Mataix-Cols D. Refining the diagnostic boundaries of compulsive hoarding: a critical review. Clin Psychol Rev. 2010a; 30:371–86. [PubMed: 20189280]

Pertusa A, Frost RO, Mataix-Cols D. When hoarding is a symptom of OCD: a case series and implications for DSM-V. Behav Res Ther. 2010b; 48:1012–20. [PubMed: 20673573]

Pertusa A, Fullana MA, Singh S, Alonso P, Menchon JM, Mataix-Cols D. Compulsive hoarding: OCD symptom, distinct clinical syndrome, or both? Am J Psychiatry. 2008; 165:1289–98. [PubMed: 18483134]

Rachman S, Elliott CM, Shafran R, Radomsky AS. Separating hoarding from OCD. Behav Res Ther. 2009; 47:520–2. [PubMed: 19296929]

Reid JM, Arnold E, Rosen S, Mason G, Larson MJ, Murphy TK, Storch EA. Hoarding behaviors among nonclinical elderly adults: correlations with hoarding cognitions, obsessive-compulsive symptoms, and measures of general psychopathology. J Anxiety Disord. 2011; 25:1116–22. [PubMed: 21889875]

Research Triangle Institute. Software for Survey Data Analysis (SUDAAN), Version 9.0). Research Triangle Park, NC: Research Triangle Institute; 2004.

Rodriguez C, Panero L, Tannen A. Personalized intervention for hoarders at risk of eviction. Psychiatr Serv. 2010; 61:205. [PubMed: 20123831]

Rodriguez CI, Herman D, Alcon J, Chen S, Tannen A, Essock S, Simpson HB. Prevalence of hoarding disorder in individuals at potential risk of eviction in New York City: a pilot study. J Nerv Ment Dis. 2012; 200:91–4. [PubMed: 22210369]

Ruscio AM, Stein DJ, Chiu WT, Kessler RC. The epidemiology of obsessive-compulsive disorder in the National Comorbidity Survey Replication. Mol Psychiatry. 2010; 15:53–63. [PubMed: 18725912]

Salyers MP, Bosworth HB, Swanson JW, Lamb-Pagone J, Osher FC. Reliability and validity of the SF-12 health survey among people with severe mental illness. Medical care. 2000; 38:1141–50. [PubMed: 11078054]

Samuels J, Bienvenu OJ 3rd, Riddle MA, Cullen BA, Grados MA, Liang KY, Hoehn-Saric R, Nestadt G. Hoarding in obsessive compulsive disorder: results from a case-control study. Behav Res Ther. 2002; 40:517–28. [PubMed: 12043707]

Samuels JF, Bienvenu OJ, Grados MA, Cullen B, Riddle MA, Liang KY, Eaton WW, Nestadt G. Prevalence and correlates of hoarding behavior in a community-based sample. Behav Res Ther. 2008; 46:836–44. [PubMed: 18495084]

Saxena S. Is compulsive hoarding a genetically and neurobiologically discrete syndrome? Implications for diagnostic classification. Am J Psychiatry. 2007; 164:380–4. [PubMed: 17329459]

Saxena S. Pharmacotherapy of compulsive hoarding. J Clin Psychol. 2011; 67:477–84. [PubMed: 21404273]

Saxena S. Recent advances in compulsive hoarding. Curr Psychiatry Rep. 2008; 10:297–303. [PubMed: 18627667]

Saxena S, Brody AL, Maidment KM, Baxter LR Jr. Paroxetine treatment of compulsive hoarding. J Psychiatr Res. 2007; 41:481–7. [PubMed: 16790250]

Shafran R, Tallis F. Obsessive-compulsive hoarding: A cognitive-behavioral approach. Behavioral and Cognitive Psychotherapy. 1996; 24:209–221.

Sorrell JM. Understanding hoarding in older adults. Journal of psychosocial nursing and mental health services. 2012; 50:17–21. [PubMed: 22372828]

Steketee G, Frost R. Compulsive hoarding: current status of the research. Clin Psychol Rev. 2003; 23:905–27. [PubMed: 14624821]

Steketee G, Frost RO, Tolin DF, Rasmussen J, Brown TA. Waitlist-controlled trial of cognitive behavior therapy for hoarding disorder. Depress Anxiety. 2010; 27:476–84. [PubMed: 20336804]

Timpano KR, Exner C, Glaesmer H, Rief W, Keshaviah A, Brahler E, Wilhelm S. The epidemiology of the proposed DSM-5 hoarding disorder: exploration of the acquisition specifier, associated features, and distress. J Clin Psychiatry. 2011; 72:780–6. quiz 878–9. [PubMed: 21733479]

Tolin DF, Frost RO, Steketee G. An open trial of cognitive-behavioral therapy for compulsive hoarding. Behav Res Ther. 2007; 45:1461–70. [PubMed: 17306221]

Tolin DF, Frost RO, Steketee G, Gray KD, Fitch KE. The economic and social burden of compulsive hoarding. Psychiatry Res. 2008; 160:200–11. [PubMed: 18597855]

Tolin DF, Meunier SA, Frost RO, Steketee G. Hoarding among patients seeking treatment for anxiety disorders. J Anxiety Disord. 2011; 25:43–8. [PubMed: 20800427]

Ware J Jr, Kosinski M, Keller SD. A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. Medical care. 1996; 34:220–33. [PubMed: 8628042]

Wheaton M, Timpano KR, Lasalle-Ricci VH, Murphy D. Characterizing the hoarding phenotype in individuals with OCD: associations with comorbidity, severity and gender. J Anxiety Disord. 2008; 22:243–52. [PubMed: 17339096]

Wu KD, Watson D. Hoarding and its relation to obsessive-compulsive disorder. Behav Res Ther. 2005; 43:897–921. [PubMed: 15896286]

Table 1

Sociodemographic Characteristics of Individuals With and Without a History of Difficulty Discarding

	Difficulty Discarding (N=8,331)		No Difficulty Discarding (N=33, 258)				
	%	SE	%	SE	OR	95% CI	
Sex							
Men	47.84	0.68	47.76	0.36	1.00	0.94	1.07
Women	52.16	0.68	52.24	0.36	1.00	ref	ref
Race/Ethnicity							
White	77.15	1.17	69.46	1.70	1.00	ref	ref
Black	9.99	0.70	11.22	0.66	**0.80**	0.73	0.88
Native/American	2.77	0.26	1.94	0.16	**1.29**	1.06	1.57
Asian	2.58	0.41	4.82	0.60	**0.48**	0.37	0.63
Hispanic	7.51	0.82	12.57	1.35	**0.54**	0.48	0.60
Nativity							
US-born	92.03	0.82	83.81	1.64	**2.23**	2.00	2.49
Foreign-born	7.97	0.82	16.19	1.64	1.00	ref	ref
Age, years							
18–29	17.99	0.53	22.96	0.41	1.00	ref	ref
30–44	23.56	0.57	32.76	0.36	0.92	0.84	1.01
45–64	34.85	0.65	29.97	0.34	**1.48**	1.36	1.62
65+	23.60	0.54	14.31	0.34	**2.11**	1.93	2.30
Education							
Less than high school	15.66	0.54	15.43	0.56	1.07	0.97	1.19
High school	31.51	0.73	28.74	0.59	**1.16**	1.08	1.25
College or higher	52.82	0.86	55.82	0.68	1.00	ref	ref
Annual Income $							
0–19999	49.39	0.86	46.63	0.62	1.00	ref	ref
20000–34999	22.76	0.62	22.60	0.40	0.95	0.88	1.03
35000–69999	21.00	0.65	22.28	0.42	**0.89**	0.81	0.98
70000+	6.86	0.40	8.48	0.42	**0.76**	0.67	0.87

	Difficulty Discarding (N=8, 331)		No Difficulty Discarding (N=33, 258)		OR	95% CI	
	%	SE	%	SE			
Marital Status							
Married/Cohabiting	62.99	0.71	61.77	0.48	1.00	ref	ref
Widowed/Separated/Divorced	19.29	0.46	16.78	0.26	**1.13**	1.05	1.21
Never married	17.72	0.58	21.45	0.48	**0.81**	0.76	0.87
Urbanicity							
Urban	75.23	1.83	81.41	1.58	1.00	ref	ref
Rural	24.77	1.83	18.59	1.58	**1.44**	1.30	1.60

Abbreviations: CI, confidence interval; OR, odds ratio; ref, reference; SE, standard error.

ORs whose CIs do not include 1 were considered significant (in bold).

Table 2

Lifetime prevalence of psychiatric disorders in individuals with and without a history of difficulty discarding

	Difficulty Discarding		No Difficulty Discarding		OR^a	95% CI	
	%	**SE**	**%**	**SE**			
Any psychiatric diagnosis	70.15	0.71	50.03	0.93	**2.56**	2.37	2.76
Any axis I diagnosis	64.85	0.76	48.40	0.96	**1.59**	1.48	1.71
Any substance use disorder	46.97	0.77	36.55	0.88	**1.28**	1.19	1.38
Any Alcohol Use Disorder	37.39	0.75	28.64	0.81	**1.13**	1.05	1.22
Alcohol abuse	20.68	0.61	17.18	0.55	**1.22**	1.12	1.32
Alcohol dependence	16.70	0.53	11.46	0.37	**0.79**	0.70	0.90
Any Drug Disorder	12.90	0.48	9.80	0.34	0.89	0.79	1.00
Drug abuse	9.29	0.39	7.44	0.27	1.04	0.92	1.17
Drug dependence	3.61	0.26	2.35	0.13	**0.80**	0.65	0.99
Nicotine dependence	23.44	0.57	16.54	0.50	1.04	0.96	1.12
Any Mood Disorder	27.17	0.62	16.55	0.37	**1.27**	1.18	1.38
Major depressive disorder	18.27	0.53	12.28	0.31	**1.21**	1.11	1.32
Bipolar disorder	8.01	0.37	3.64	0.15	**1.53**	1.33	1.76
Dysthymia	4.96	0.28	2.81	0.12	1.09	0.92	1.28
Any Anxiety Disorder	27.71	0.60	15.11	0.45	**1.53**	1.42	1.66
Panic disorder	8.69	0.39	4.56	0.16	1.14	0.99	1.32
Social Phobia	10.05	0.42	3.85	0.18	**1.69**	1.49	1.91
Specific Phobia	14.95	0.51	8.31	0.30	**1.35**	1.22	1.49
Generalized Anxiety Disorder	7.49	0.37	3.41	0.16	**1.24**	1.08	1.44
Conduct Disorder	1.41	0.17	1.00	0.08	**1.46**	1.06	2.01
Pathological Gambling	0.70	0.12	0.36	0.04	1.14	0.73	1.79
Psychotic Disorder	0.53	0.09	0.24	0.04	0.86	0.51	1.43
Any Axis II Disorder	31.62	0.73	10.99	0.30	**3.61**	3.30	3.95
Avoidant	5.02	0.30	1.75	0.10	**1.52**	1.25	1.85
Dependent	1.18	0.14	0.33	0.04	1.36	0.92	2.01

	Difficulty Discarding		No Difficulty Discarding			95% CI	
	%	SE	%	SE	OR[a]		
OCPD	21.92	0.65	4.56	0.17	**5.20**	4.63	5.85
OCPD without difficulty discarding[b]	14.19	0.52	4.27	0.18	**2.98**	2.62	3.39
Paranoid	9.18	0.37	3.35	0.15	**1.84**	1.59	2.13
Schizoid	6.25	0.33	2.44	0.12	**1.53**	1.31	1.80
Antisocial	6.01	0.35	3.14	0.14	**1.21**	1.02	1.43
Histrionic	3.78	0.23	1.42	0.09	**1.56**	1.27	1.92

Abbreviations: CI, confidence interval; OCPD, Obsessive-Compulsive Personality Disorder; OR, odds ratio; SE, standard error.

ORs whose CIs do not include 1 were considered significant (in bold).

[a]Odds of meeting criteria for each comorbid diagnosis among respondents who reported difficulty discarding versus those who did not endorse difficulty discarding, adjusted for gender, race, nativity, age, education, personal income, urbanicity, region, and other psychiatric disorders.

[b]To meet criteria, 4 OCPD diagnostic criteria (excluding difficulty discarding item) were met

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Table 3

Disability and Impairment in Individuals With and Without Difficulty Discarding

Short Form 12	Difficulty Discarding		No Difficulty Discarding				
	Mean	SE	Mean	SE	Wald F	p-value
Physical component summary scale	48.38	0.17	51.18	0.11	53.25	**<0.0001**
Mental component summary scale	50.86	0.14	52.82	0.08	49.33	**<0.0001**
Social functioning scale	50.29	0.15	52.18	0.07	21.11	**<0.0001**
Role emotional scale	49.40	0.16	51.44	0.09	28.99	**<0.0001**
Mental health scale	50.56	0.15	52.59	0.10	44.27	**<0.0001**

P values (p <0.003–p < 0.00001) were considered significant (in bold). Odds ratios were adjusted for gender, race, nativity, age, education, personal income, urbanicity, region, and other psychiatric disorders.

Abbreviations: SE, standard error

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Table 4

Treatment correlates of Individuals With and Without Difficulty Discarding

	Difficulty Discarding		No Difficulty Discarding			95% CI	
	%	SE	%	SE	OR		
Lifetime							
Any mental health treatment	26.99	0.58	17.18	0.45	**1.78**	1.64	1.93
Any psychiatric hospitalization	6.22	0.30	3.38	0.15	**1.90**	1.63	2.20
Any emergency room visit	7.60	0.36	4.43	0.18	**1.78**	1.57	2.01
Any prescribed psychotropic meds	17.37	0.50	10.77	0.37	**1.74**	1.59	1.91
Outpatient	23.00	0.54	14.65	0.40	**1.74**	1.60	1.89
Inpatient	7.52	0.34	4.26	0.18	**1.82**	1.59	2.09
12 months							
Any mental health treatment	1.47	0.16	0.91	0.07	**1.63**	1.25	2.12
Any psychiatric hospitalization	0.39	0.08	0.23	0.03	**1.71**	1.05	2.80
Any emergency room visit	0.24	0.06	0.20	0.03	1.21	0.68	2.17
Outpatient	1.25	0.15	0.73	0.06	**1.72**	1.28	2.31
Inpatient	0.66	0.11	0.49	0.05	1.35	0.92	1.97

Abbreviations: CI, confidence interval; OR, odds ratio; SE, standard error.

ORs whose CIs do not include 1 were considered significant (in bold).