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The Etiology of Hoarding Disorder: A Review

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Abstract

This article will review the evidence of various proposed factors that contribute to the onset and maintenance of hoarding disorder (HD). Data suggests that hoarding is a chronic condition that starts early in life and does not remit if left untreated. There is emerging evidence that a number of factors contribute to the expression of HD symptoms, including genetics, neurocognitive functioning, attachments to possessions, beliefs, avoidance, personality factors, and life events. The extent to which each etiological factor uniquely contributes to hoarding is still unknown. Other demographic factors, such as socioeconomic status, age, and gender, may impact hoarding severity. Research on the causes and characteristics of hoarding has recently started making progress into understanding this newly recognized disorder, yet we still have a ways to go in understanding the biological and environmental causes. This paper will synthesize available literature on the etiology of HD.

Keywords

Hoarding disorder; Etiology; Attachment; Executive functions

Introduction

Hoarding is characterized by urges to save and acquire new items, difficulty discarding current possessions, and excessive household clutter [1]. Patients with hoarding symptoms have internal, subjective symptoms (e.g., urges to save and difficulty discarding) as well as an outward manifestation of their pathology (e.g., disabling levels of clutter). Hoarding symptoms were originally conceptualized to exist only within the context of obsessive-compulsive disorder (OCD), despite hoarding symptoms presenting in less than 5% of OCD

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cases [2]. In addition to OCD, saving items can present secondary to multiple psychiatric or physical disorders, including severe depression, traumatic brain injury, or dementia [3]. Excessive acquisition of new possessions is not present in all hoarding patients and it is included as a specifier in the diagnostic criteria of hoarding disorder (HD) [3].

HD is a psychiatric disorder in which hoarding symptoms present as separate from any comorbid conditions and cause significant distress and impairment in the afflicted individual [2, 3]. Prior to 2013, hoarding symptoms were not considered a standalone diagnosis, which poses some challenges in interpretation of the available literature that did not utilize current HD criteria. Furthermore, several investigations used self-diagnosed internet samples or nonclinical undergraduate samples. Thus, throughout this review when HD criteria was utilized we specify “HD” and when HD criteria verification could not be made we refer to hoarding or hoarding symptoms. Estimates of hoarding in the community vary from 2.3% (in the UK) [4] to up to 5.8% (in Germany) [5] although some estimates report that certain hoarding behaviors may present in up to 25% of older adults [6]. The difference in prevalence in community samples from UK and Germany may be due to differences in sampling procedures or they may be indicative of underlying cultural variations which lead to differences in hoarding prevalence [4, 5].

The cognitive-behavioral model of hoarding posed in the seminal article by Frost and Hartl [1] describes the etiology of hoarding as the interaction of information-processing deficits, emotional attachment problems, behavioral avoidance, and beliefs about the nature of possessions. Attachment issues, avoidant behaviors, and beliefs about items may mediate the influence of genetic and environmental forces. Due to the infancy of the HD diagnosis, a comprehensive review of the potential etiological factors is needed. To date, researchers have examined a limited number of factors at a time without piecing together all potential aspects that account for the clinical manifestation of HD. This article will review the evidence of various proposed factors leading to the onset and maintenance of HD.

The original 4-factor model of hoarding etiology posed by Frost and Hartl [1] has received increasing support and refinement over the past 2 decades. The model of hoarding of Steketee and Frost [7] added to the original conceptualization by including genetic vulnerability as a predisposing factor and discussing the role of reinforcement in the maintenance of hoarding symptoms. Behaviors related to excessive acquisition and avoidance of discarding are reinforced when the patient avoids the anticipated distress of making an incorrect decision about a given object. Available research was reviewed below to increase our understanding of the etiology of this relatively new diagnosis.

Genetics

Twin studies suggest that up to 50% of the variance in hoarding behaviors may be genetically linked [4, 8]. This is higher than the variance estimated for genetic effects on anxiety symptoms in general (30% heritability) [9], but lower than estimates for the heritability of attention deficit hyperactivity disorder (71–73% heritability) [10]. The self-reported family history provides further support for a genetic component to hoarding symptoms. Older adults with HD report having an average of 2 biological relatives with

hoarding symptoms, with nearly 50% of geriatric hoarding patients reporting having had a mother with hoarding tendencies [11]. Although self-report data of this kind cannot fully parse out the effect of genes and the environment (e.g., the effect of genes and epigenetics vs. social learning), it does suggest a strong familial link in the etiology of HD. Thus, although biology is an important factor in hoarding, it does not account for the total clinical manifestation. Further genetic studies are needed to gain a better understanding of the extent of the biological basis of the disorder.

Neurocognitive Functioning

There is growing research on the connections between HD diagnosis, symptom severity, and executive dysfunction. A recent review of cognitive performance in HD found evidence for impairment in multiple cognitive domains [12], particularly executive functioning. Individuals with HD demonstrate impaired decision making, compared to nonhoarding individuals, on unstructured sorting tasks but not on standardized neuropsychological assessments [13]. Deficits in decision making may increase the distress felt by hoarding patients when forced to choose whether to keep or discard an object. Hoarding may also be linked to inattentiveness and a lack of inhibition [14]. Thus, individuals with HD may have more difficulty inhibiting an initial urge to acquire an additional object. Hoarding may be linked to difficulty with categorization and organization, but the research is mixed [13, 15] likely due to differences in samples or neurocognitive tests. When compared with age- and education-matched controls, individuals with HD have an increased incidence of impairment in visual memory, visual detection, and visual categorization [16].

These effects may in turn contribute to the maintenance and progression of hoarding symptoms. Individuals with HD may experience premature cognitive aging; a recent study concluded that older adults with HD exhibited impairment in executive functioning beyond what would be expected due to normal aging [17]. Older adults with HD also demonstrate significantly more executive dysfunction when compared with nonclinical healthy controls [18].

Within a geriatric HD sample, increased hoarding symptoms have been associated with impaired executive functioning when controlling for comorbid psychiatric symptoms [19]. This is similar to the impact of other psychiatric diseases, including schizophrenia [20] and depression [21, 22].

Overall, although there are several limitations with the current literature on neurocognitive functioning and hoarding, including the use of nonclinical samples and a lack of control groups, there is a consistent pattern of difficulty with executive functioning.

Attachment, Beliefs, Behaviors, and Emotions

Increased attachment to possessions and increased anthropomorphization of objects were part of the original conceptualization of hoarding [23] and continue to be a critical facet in the cognitive-behavioral model of HD. Within the context of OCD, hoarding symptom severity has been found to be predictive of the initial emotional attachment to a new object with no objective sentimental value, although the initial attachment to an object has been

found to be the best predictor of a later attachment to the same object [24]. Research in a nonclinical undergraduate sample suggests that an increased hoarding symptom severity is associated with an increased tendency to anthropomorphize objects [25]. The association was replicated in a community sample and when controlling for social anxiety symptom severity [26]. However, we should be cautious in interpreting research utilizing nonclinical HD samples.

Beliefs about possessions and attachment start to overlap when examining hoarding symptoms. Individuals both with and without hoarding symptoms tend to endorse emotional attachment as the most likely reason for saving an object [27–29]. However, HD patients and self-identified collectors are also likely to cite potential usefulness as a primary reason for saving an object [29]. Patients with HD are also more likely to endorse all potential reasons for saving an object more highly [27, 28], which may partially explain why HD patients have more difficulty making decisions about their own objects [13]. A recent study of adults with HD looking at specific reasons or beliefs for saving (losing important information, sentimentality or emotional significance, wasting a potentially useful object, and beauty or aesthetic appeal) found that participants tended to endorse all reasons for saving in the moderate to severe range [30]. When controlling for HD patients' tendency to overendorse reasons for saving, potential usefulness was the most uniquely predictive of hoarding symptom severity [30].

Patients suffering from HD exhibit patterns of behavioral avoidance of distressful situations (e.g., sorting/discarding) that have been continually reinforced over time. Consistent with exposure paradigms for anxiety, trauma, and obsessive-compulsive-based disorders, exposure sessions for HD are designed to help the patient to assess the correct threat level of the feared situation (e.g., if they throw away something "valuable" there is a low likelihood of a negative consequence) as well as to learn that they are capable of enduring the distress of the situation. Furthermore, research suggests that within HD patients, hoarding symptom severity is associated with behavioral avoidance even when controlling for comorbid symptoms of anxiety and depression [31].

Anxiety sensitivity and distress tolerance are 2 person level factors that may mediate the relationship between maladaptive beliefs and behavioral avoidance. Individuals with high levels of anxiety sensitivity, or "fear of fear", tend to interpret signs of anxiety as being inherently negative in nature [32]. In contrast, distress tolerance is used to describe an individual's ability to withstand uncomfortable emotions. In undergraduate samples, high anxiety sensitivity and low distress tolerance have been linked to increased hoarding symptom severity, even when controlling for comorbid depression, anxiety, and obsessive-compulsive symptoms [32]. Furthermore, the relationship between distress tolerance and hoarding has been found to be moderated by anxiety sensitivity, such that the association between distress tolerance and hoarding is only significant at high levels of anxiety sensitivity [32].

Emotional reactivity describes the intensity and duration of emotions an individual experiences following exposure to emotional stimuli [33] and it has been postulated as a possible vulnerability factor for HD. An internet study of individuals who self-reported

hoarding symptoms found that individuals with higher levels of emotional reactivity also reported higher levels of hoarding symptom severity [33]. The association was strongest in the context of higher levels of fear of making an incorrect decision and lower levels of confidence in the individual's ability to remember information [33].

Personality Traits

Hoarding patients have long been described by clinicians as exhibiting personality traits related to perfectionism and indecisiveness [1]. Increased scores on self-report scales of perfectionism, indecision, and procrastination have been found to be uniquely predictive of HD diagnosis [5]. The archetypal hoarding patient is unable to make a decision about their items both due to fear of making the wrong decision (e.g., throwing away an item they might need in the future) and the need to make the correct choice (e.g., keeping an item that they needed). Due to fear of making a wrong choice, the patient often prefers to make no choice at all or to make the default decision of keeping (or acquiring) the object.

In addition to certain personality traits, hoarding patients may have an increased frequency of specific personality disorders. Samuels et al. [34] found that increased hoarding behaviors in the community were associated with an increased likelihood of meeting criteria for a paranoid, schizotypal, avoidant, or obsessive-compulsive personality disorders.

Trauma and Life Events

Frost et al. [35] found that individuals with HD reported a greater frequency of past traumatic events than did individuals with OCD but no difference in the frequency of comorbid posttraumatic stress disorder. Tolin et al. [36] reported that 76% of an internet sample of self-reported hoarding patients reported a history of interpersonal violence. In contrast, a recent study utilizing an undergraduate sample concluded that there was no significant association between the frequency of traumatic events and self-reported hoarding [37].

Grisham et al. [38] reported that 55% of a sample of adults with hoarding problems expressed having endured a stressful life event (positive or negative) prior to the onset of their hoarding symptoms. Individuals who reported a stressful life event prior to the onset of hoarding symptoms also reported a later age of onset [38]. The 2 groups did not differ on current symptom severity [38], suggesting that any effect of the stressful life event did not extend to the current symptom presentation. Samuels et al. [34] found that self-reported "childhood adversities" (e.g., home robberies, physical abuse) were significantly associated with increased hoarding behaviors in a community sample.

Socioeconomic Status

Socioeconomic status may be a moderating variable in the development and progression of hoarding symptoms. Samuels et al. [34] reported that the incidence of hoarding behaviors in a community sample was inversely associated with income level. Low-income individuals with HD may be more likely to experience homelessness than their nonhoarding counterparts; this is especially true for geriatric HD patients [39].

Age

To date, there have not been any longitudinal studies examining factors preceding the onset of HD or empirical studies of HD in children. Instead, extant research into the age of onset of HD is reliant on retrospective data [36, 38, 40] and only one study [40] used a sample of participants meeting DSM-5 criteria for HD. The onset of hoarding symptoms, whether in the context of hoarding symptoms or HD, is most likely to occur prior to age 20 years [36, 38, 40], which is consistent with the typical age of onset of OCD [41]. However, in contrast to the typical cyclical course of OCD symptoms across the lifespan [42], hoarding symptoms are likely to be chronic [36] and progressive over the lifespan [36, 40, 43]. One recent study indicated that the prevalence of provisional HD diagnoses increased steadily by 20% with every 5 years of age [43]. Specifically, difficulty discarding appeared to account for increases in HD diagnoses with age [43].

Gender

Gender may play a role in impacting the effects of genetic and environmental factors on the development and presentation of HD. More women than men present for treatment and women tend to report a higher hoarding severity [11, 44]. Gender may impact the reasons for saving endorsed by hoarding patients [30]. Women are more likely than men to endorse saving items because they perceive the items to be aesthetically pleasing or to contain important information [30]. Because women with HD are more likely than men to seek treatment, our extant knowledge about gender differences in hoarding symptom severity may be biased.

There are mixed reports about gender differences in the prevalence of hoarding. Early epidemiological estimates of gender differences in hoarding prevalence suggest that hoarding behaviors may be more common in men than in women (4–6% in men vs. 2–3% in women) [4, 34], but no gender differences have been found in the prevalence of individuals meeting DSM-5 criteria for HD [5] or in a recent population-based study [43]. However, one study of pediatric OCD found that hoarding symptoms are more prevalent in girls than in boys [45].

Conclusions

HD is a nascent diagnosis and as such research into its etiology and progression continues to evolve. The current theory postulates that the manifestation of hoarding is likely due to a combination of genetic factors, vulnerability towards avoidant behaviors, and a reinforcement of beliefs surrounding reasons to save objects. The work to date largely supports the model of hoarding Steketee and Frost [7]. The most likely developmental course of HD involves a gene-environment correlation and a cascading effect: individuals who have a genetic predisposition towards hoarding and executive functioning problems may be more likely to be raised by parents who model saving behaviors, as well as beliefs about the need to save objects and prevent the discarding of possessions.

More research on progression of hoarding across the lifespan is needed as this is the only known psychiatric illness to increase in prevalence and severity with age [4, 5, 41, 46].

Furthermore, additional genetic studies investigating the onset of hoarding in clinical samples would help us to understand how this illness clinically manifests. Overall, the HD literature is making progress, yet we still need further investigations with controlled, robust HD clinical samples.

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References

1. Frost RO, Hartl TL: A cognitive-behavioral model of compulsive hoarding. Behav Res Ther 1996;34:341–350. [PubMed: 8871366]
2. Mataix-Cols D, Frost RO, Pertusa A, et al. Hoarding disorder: a new diagnosis for DSM-V? Depress Anxiety 2010;27:556–572. [PubMed: 20336805]
3. American Psychiatric Association: Diagnostic and Statistical Manual of Mental Health Disorders: DSM-5, ed 5. Washington, American Psychiatric Publishing, 2013.
4. Iervolino AC, Perroud N, Fullana MA, et al. Prevalence and heritability of compulsive hoarding: a twin study. Am J Psychiatry 2009; 166:1156–1161. [PubMed: 19687130]
5. Timpano KR, Keough ME, Traeger L, et al. General life stress and hoarding: examining the role of emotional tolerance. Int J Cogn Ther 2011;4:263–279.
6. Marx MS, Cohen-Mansfield J: Hoarding behavior in the elderly: a comparison between community-dwelling persons and nursing home residents. Int Psychogeriatr 2003; 15:289–306. [PubMed: 14756164]
7. Steketee G, Frost RO: Compulsive Hoarding and Acquiring: Therapist Guide. New York, Oxford University Press, 2007.
8. Nordsletten AE, Monzani B, Fernández de la Cruz L, et al. Overlap and specificity of genetic and environmental influences on excessive acquisition and difficulties discarding possessions: implications for hoarding disorder. Am J Med Genet B Neuropsychiatr Genet 2013;162B:380–387. [PubMed: 23533058]
9. Gregory AM, Eley TC: The genetic basis of child and adolescent anxiety; in Silverman WK, Field AP (eds): Anxiety Disorders in Children and Adolescents, ed 2. New York, Cambridge University Press, 2011, pp 161–178.
10. Nikolas MA, Burt SA: Genetic and environmental influences on ADHD symptom dimensions of inattention and hyperactivity: a meta-analysis. J Abnorm Psychol 2010; 119:1. [PubMed: 20141238]
11. Ayers CR, Dozier ME: Predictors of hoarding severity in older adults with hoarding disorder. Int Psychogeriatr 2015;27:1147–1156. [PubMed: 25115688]
12. Woody SR, Kellman-McFarlane K, Welsted A: Review of cognitive performance in hoarding disorder. Clin Psychol Rev 2014;34:324–336. [PubMed: 24794835]
13. Grisham JR, Norberg MM, Williams AD, et al. Categorization and cognitive deficits in compulsive hoarding. Behav Res Ther 2010; 48:866–872. [PubMed: 20542489]
14. Grisham JR, Brown TA, Savage CR, et al. Neuropsychological impairment associated with compulsive hoarding. Behav Res Ther 2007; 45:1471–1483. [PubMed: 17341416]
15. Wincze JP, Steketee G, Frost RO: Categorization in compulsive hoarding. Behav Res Ther 2007;45:63–72. [PubMed: 16530724]
16. Mackin RS, Vigil O, Insel P, et al. Patterns of clinically significant cognitive impairment in hoarding disorder. Depress Anxiety 2015;33:211–218. [PubMed: 26474146]

17. Dozier ME, Wetherell JL, Twamley EW, et al. The relationship between age and neurocognitive and daily functioning in adults with hoarding disorder. Int J Geriatr Psychiatry 2016; 31:1329–1336. [PubMed: 26876803]
18. Ayers CR, Wetherell JW, Schiehser DM, et al. Executive functioning in older adults with hoarding disorder. Int J Geriatr Psychiatry 2013;28:1175–1181. [PubMed: 23440720]
19. Ayers CR, Dozier ME, Wetherell JL, et al. Executive functioning in participants over age of 50 with hoarding disorder. Am J Geriatr Psychiatry 2016;24:342–349. [PubMed: 26809603]
20. Friedman JI, Harvey PD, Kemether E, et al. Cognitive and functional changes with aging in schizophrenia. Biol Psychiatry 1999;46:921–928. [PubMed: 10509175]
21. Diniz BS, Butters MA, Albert SM, et al. Late-life depression and risk of vascular dementia and Alzheimer's disease: systematic review and meta-analysis of community-based cohort studies. Br J Psychiatry 2013;202:329–335. [PubMed: 23637108]
22. Steffens DC, Potter GG: Geriatric depression and cognitive impairment. Psychol Med 2008;32:163–175.
23. Frost RO, Krause M, Steketee G: Hoarding and obsessive compulsive symptoms. Behav Modif 1996;20:116–132. [PubMed: 8561769]
24. Grisham JR, Frost RO, Steketee G, et al. Formation of attachment to possessions in compulsive hoarding. J Anxiety Disord 2009;23:357–361. [PubMed: 19201154]
25. Timpano KR, Shaw AM: Conferring human-ness: the role of anthropomorphism in hoarding. Pers Individ Dif 2013;54:383–388.
26. Neave N, Jackson R, Saxton T, et al. The influence of anthropomorphic tendencies on human hoarding behaviours. Pers Individ Dif 2015;72:214–219.
27. Steketee G, Frost RO, Kyrios M: Cognitive aspects of compulsive hoarding. Cognit Ther Res 2003; 27:463–479.
28. Gordon OM, Salkovskis PM, Oldfield VB: Beliefs and experiences in hoarding. J Anxiety Dis 2013;27:328–339.
29. Nordsletten AE, Fernández de la Cruz L, Billotti D, et al. Finders keepers: the features differentiating hoarding disorder from normative collecting. Compr Psychiatry 2013;54:229–237. [PubMed: 22995450]
30. Dozier ME, Ayers CR: The predictive value of different reasons for saving and acquiring on hoarding disorder symptoms. J Obsessive Compuls Relat Disord 2014;3:220–227.
31. Ayers CR, Castriotta N, Dozier ME, et al. Behavioral and experiential avoidance in patients with hoarding disorder. J Behav Ther Exp Psychiatry 2014;45:408–414. [PubMed: 24828750]
32. Timpano KR, Buckner JD, Richey JA, et al. Exploration of anxiety sensitivity and distress tolerance as vulnerability factors for hoarding behaviors. Depress Anxiety 2009;26:343–353. [PubMed: 19123454]
33. Shaw AM, Timpano KR, Steketee G, et al. Hoarding and emotional reactivity: the link between negative emotional reactions and hoarding symptomatology. J Psychiatr Res 2015;63:84–90. [PubMed: 25732668]
34. Samuels JF, Bienvenu OJ, Grados MA, et al. Prevalence and correlates of hoarding behaveior in a community-based sample. Behav Res Ther 2008;46:836–844. [PubMed: 18495084]
35. Frost RO, Steketee G, Tolin DF: Comorbidity in hoarding disorder. Depress Anxiety 2011; 28:876–884. [PubMed: 21770000]
36. Tolin DF, Meunier SA, Frost RA, et al. Course of compulsive hoarding and its relationship to life events. Depress Anxiety 2010;27:829–838. [PubMed: 20336803]
37. Shaw AM, Witcraft SM, Timpano KR: The relationship between traumatic life events and hoarding symptoms: a multi-method approach. Cogn Behav Ther 2016;45:49–59. [PubMed: 26895444]
38. Grisham JR, Frost RO, Steketee G, et al. Age of onset of compulsive hoarding. J Anxiety Disord 2006;20:657–686.
39. Rodriguez CI, Herman D, Alcon J, et al. Prevalence of hoarding disorder in individuals at potential risk of eviction in New York City: a pilot study. J Nerv Ment Dis 2012;200:91–94. [PubMed: 22210369]

40. Dozier ME, Porter B, Ayers CR: Age of onset and progression of hoarding symptoms in older adults with hoarding disorder. Aging Ment Health 2015;20:736–742. [PubMed: 25909628]

41. Weissman MM, Bland RC, Canino GJ, et al. The cross national epidemiology of obsessive compulsive disorder: the Cross National Collaborative Group. J Clin Psychiatry 1994;55:5–10.

42. Fineberg NA, Hengartner MP, Bergbaum C, et al. Remission of obsessive-compulsive disorders and syndromes; evidence from a prospective community cohort study over 30 years. Int J Psychiatry Clin Pract 2013; 17:179–197. [PubMed: 23428237]

43. Cath DC, Nizar K, Boomsma D, Mathews CA: Age-specific prevalence of hoarding and obsessive compulsive disorder: a population-based study. Am J Geriatr Psychiatry 2017;25:245–255. [PubMed: 27939851]

44. Reid JM, Arnold E, Rosen S, et al. Hoarding behaviors among nonclinical elderly adults: correlations with hoarding cognitions, obsesssive-compulsive symptoms, and measures of general psychopathology. J Anxiety Disord 2011;25:1116–1122. [PubMed: 21889875]

45. Samuels J, Grados MA, Riddle MA, et al. Hoarding in children and adolescents with obsessive-compulsive disorder. J Obsessive Compuls Relat Disord 2014;3:325–331. [PubMed: 25309849]

46. Kessler RC, Berglund P, Demler O, et al. Life-time prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. Arch Gen Psychiatry 2005;62:593–602. [PubMed: 15939837]