

REVIEW PAPER

Psychosocial interventions for hoarding disorder: a systematic review

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Abstract

Introduction: Hoarding disorder (HD) is primarily characterised by difficulties with discarding possessions. Evidence-based psychological interventions such as CBT have been found to be of benefit to people with HD. However, people with HD may receive a psychosocial intervention provided by other professions such as social workers or a multi-disciplinary team before receiving psychological therapy, if at all.

Objectives: The aim of this systematic review is to evaluate psychosocial interventions for HD.

Method: Searches were conducted on three databases (PsycInfo; MEDLINE; Embase) and grey literature, and the search strategy was designed to capture psychosocial interventions for adults with HD.

Results: Studies ($n = 5$) were included where the outcome was related to a psychosocial factors, such as fire safety, tenancy preservation and QoL. These psychosocial interventions show improvements in those with HD, with effect sizes ranging from $d = 0.86$ to $d = 1.41$.

Conclusions: Despite the limited research on psychosocial interventions for HD, this systematic review suggests it is a promising area for further research in this area.

Key learning aims

- (1) To identify what psychosocial interventions are available for people experiencing hoarding difficulties.
- (2) To identify how available psychosocial interventions for hoarding difficulties are delivered and by whom.
- (3) To examine the effectiveness of psychosocial interventions for people experiencing hoarding difficulties.

Keywords: hoarding disorder; interventions; multi-disciplinary; psychosocial

Introduction

Hoarding disorder (HD) is a mental health disorder characterised by difficulty discarding possessions, resulting in deterioration in living conditions, clutter, distress, and impairment to the individual's functioning (American Psychiatric Association, 2013). HD often presents in adolescence (Tolin *et al.*, 2010), with severity increasing with age (Ayers *et al.*, 2010). Hoarding is linked to an increased risk of fire, increased damage when fires occur (London Fire Brigade, 2020), and a disproportionate number of fire-related fatalities (Chief Fire Officers Association, 2014; Lucini *et al.*, 2009). There is evidence of an association between hoarding and an increased risk of

accidental death (Waters *et al.*, 2022). Hoarding has a significant impact on social care services, public health and systems around the individual with HD (Tolin *et al.*, 2008; Bratiotis and Woody, 2020).

Individuals with HD are proposed to have vulnerabilities such as challenging early life experiences, genetic factors, and family influence. The individual is proposed to experience cognitive and information processing difficulties in relation to their decision making, attention, problem solving capacity and memory (Grisham *et al.*, 2010). These vulnerabilities and cognitive factors influence the beliefs that an individual develops in relation to objects and themselves, including their identity, values, responsibility, memory and control. These factors contribute to the saving and acquiring cycle, where positive (e.g. positive emotional responses to objects, or desire to acquire) or negative emotional responses (e.g. avoidance), reinforce of saving and acquiring (Steketee and Frost, 2007).

Cognitive behavioural therapy (CBT) is an empirical psychological intervention for HD (Bratiotis *et al.*, 2021; Frost and Hartl, 1996), with modifications including group and peer supported delivery (Bratiotis and Steketee, 2015). A meta-analysis of CBT interventions ($n = 12$) for HD found that whilst CBT typically leads to reliable change with a large effect size ($g = 0.82$), it does not produce clinically significant change for the majority (57–76%) of participants (Tolin *et al.*, 2015), although a more recent meta-analysis (Rodgers *et al.*, 2021) found a larger effect size ($g = 1.25$) than Tolin and colleagues. A systematic review of interventions for HD with a broader scope [i.e. including psychopharmacology ($n = 3$), psychological (CBT $n = 12$), cognitive remediation ($n = 2$), family interventions (Family Therapy, $n = 2$) and online support groups ($n = 1$)] reported significant improvements in hoarding symptoms across standardised outcome measures, for all included interventions (Thompson *et al.*, 2017). However, this change was not clinically meaningful for most participants, who remained significantly impaired, scoring above clinical cut-offs for HD.

Few individuals with HD seek help from mental health services, with one study identifying that only 16% of their sample sought help (Robertson *et al.*, 2020). Lack of knowledge about treatment (42%), its potential helpfulness (26%; Robertson *et al.*, 2020) and acceptability (Rodriguez *et al.*, 2016) of psychological interventions are cited as barriers to help seeking and engagement. Approximately 58% of individuals felt that they would prefer to resolve their hoarding difficulties without psychological support, while 28% of individuals with HD believed their hoarding difficulties did not require psychological intervention (Robertson *et al.*, 2020). Help is often only sought in later life when difficulties have become more severe or support systems have been lost (Eckfield and Wallhagen, 2013; Mackin *et al.*, 2011).

Barriers to help seeking and engagement, in combination with limitations in achieving clinically meaningful change, raise questions regarding the utility of psychological interventions as the primary intervention for HD. Some individuals with HD may not be ready to access and use psychological interventions until their physical and safety needs have been met. Rodriguez *et al.* (2012) found that of people at risk of eviction due to severe HD, only half were receiving support for their mental health. Recent research has highlighted the potential importance of integrating harm reduction approaches to improve the safety of an individual before psychological intervention (David *et al.*, 2021).

Researchers have begun to investigate the utility of interventions for HD with a psychosocial focus (Davidson *et al.*, 2019). Psychosocial interventions can be conceptualised by the interdisciplinary biopsychosocial model, which highlights the importance of recognising the interaction between individuals, their physical and social context, and community is key (Egan *et al.*, 2008; England *et al.*, 2015; Martikainen *et al.*, 2002). Psychosocial interventions can therefore aim to impact social, behavioural and environmental stressors, alongside promoting the development of adaptive coping strategies. A range of psychosocial interventions for HD have been developed and are delivered by non-healthcare professionals via local government organisations, including fire departments and social care services. Typically, these interventions

have a practical focus aiming to reduce fire and health risk, increase housing stability and improve quality of life for the individual with HD. Such interventions generally have secondary benefits to the state of the property and the consequent impact on the community (Bratiotis *et al.*, 2019; Bratiotis and Woody, 2020).

To date, no reviews have synthesised the psychosocial interventions available for HD. In previous reviews of interventions for HD, psychosocial interventions related to fire safety and housing stability, delivered by allied health professionals (e.g. nurses, social workers and multi-disciplinary teams) have been excluded. Consequently, the relative effectiveness of these interventions is unknown. This is important given the reported reluctance from people with HD to seek support from mental health services and the likelihood that any support will instead be provided by other professionals. Thus, the aim of this review is to identify and synthesise what psychosocial approaches are available for HD, how and who delivers such interventions, and how effective these interventions are.

Method

The protocol for this systematic review was pre-registered on PROSPERO (<https://www.crd.york.ac.uk/prospero/>; CRD42021239453). The reporting of this review follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA; Page *et al.*, 2021) and Synthesis Without Meta-analysis guidelines (SWiM; Campbell *et al.*, 2020).

Inclusion and exclusion criteria

Participants

Inclusion criteria. Adults aged 18+ who meet HD diagnostic criteria or have been diagnosed with HD based upon DSM (American Psychiatric Association, 2013), ICD (World Health Organisation, 1993; World Health Organisation, 2019) criteria or who had scored above clinical cut-offs on standardised HD measures, e.g. Hoarding Rating Scale (HRS; Tolin *et al.*, 2010); Savings Inventory-Revise (SI-R; Frost *et al.*, 2004); Clutter Image Rating (CIR; Frost *et al.*, 2008), or whose homes were identified as premises impacted by hoarding.

Exclusion criteria. Participants were excluded if animal hoarding was identified as the primary HD difficulty. There were no exclusions based on participant co-morbidities, location, gender, sex, ethnicity, or medication usage, provided that HD was the primary mental health difficulty.

Intervention

Inclusion criteria. ‘Psychosocial’ was defined as: ‘pertaining to the influence of social factors on an individual’s mind or behaviour, and to the interrelation of behavioural and social factors’ (*Oxford English Dictionary*, 2012). Therefore, ‘Psychosocial Interventions’ will be included if they aim to change or influence the individual’s behavioural and social factors, with the primary outcome being psychosocial in nature (i.e. increasing housing stability, reducing fire risk, improving quality of life).

Exclusion criteria. Interventions primarily focused on animal hoarding were excluded. Psychological treatment interventions [e.g. CBT, Family Therapy, compassion focused therapy (CFT)] that were defined by the study authors as being such (e.g. this intervention is CBT/CFT) or where the modality of the intervention was not specifically named, but described components that clearly represented the type of therapy (e.g. an intervention must include change in cognitions that goes beyond learning practical skills to be considered CBT) were excluded.

Comparator/control

Inclusion criteria. All interventions were eligible as comparator/control conditions. However, not all included studies need to consist of a comparator/control intervention.

Outcome

Primary outcomes. The primary outcomes were psychosocial (i.e. focused on the psychosocial world of the individual with HD, i.e. quality of life, fire safety, housing stability, clutter in the home). This could be investigated using standardised outcome measures (e.g. Clutter Image Rating (CIR); Frost *et al.*, 2008) or unstandardised measures (e.g. case outcome, fire code violations).

Secondary outcomes. Secondary outcomes could include standardised measures linked to hoarding symptomatology (e.g. Hoarding Rating Scale (HRS); Tolin *et al.*, 2010).

Study design

Inclusion criteria. All study designs were included.

Identification of studies

Search strategy

Searches were conducted using three databases: PsycInfo (APA PsycNET); PubMed (MEDLINE); and Embase (Embase.com). Grey literature was searched using PsyArXiv. The first empirically based conceptual framework for HD was published in 1993 (Frost and Gross, 1993), thus the range for the searches was January 1993 to April 2022 (searches updated in January 2024, with no new records meeting inclusion criteria). The search strategy was designed to capture (1) psychosocial interventions for (2) adults with (3) HD using relevant keywords (see [Supplementary material](#) for full search strategy).

Selection of studies

Identified studies were screened for duplicates through Covidence Systematic Review Software (www.covidence.org), with additional duplicates manually identified and excluded. Eighty-five per cent of titles and abstracts were double-screened against the inclusion and exclusion criteria by two independent reviewers (D.T. and E.B.). Studies that passed the initial screen were reviewed as full text by two independent reviewers (D.T. and E.B.). The reference lists of all included studies were independently searched for relevant studies. Any discrepancies were discussed by the two reviewers, and consensus was reached. Where additional discussion was required, a third reviewer (J.M.) was consulted.

Data extraction

Two reviewers (D.T. and E.B.) independently extracted relevant data from all included studies. Data extracted include: title, setting, study design, study duration, inclusion and exclusion criteria, mean age and diagnosis (see [Supplementary material](#) for details of the data extraction criteria).

Quality assessment

Two reviewers (D.T. and E.B.) independently assessed the quality of all included studies using the Mixed Methods Appraisal Tool (MMAT; Hong *et al.*, 2018). The MMAT was chosen as it enables quality appraisal of all study designs. Included studies were first reviewed based on two screening questions, to determine if they met the criteria for empirical studies. This was followed by quality

appraisal of the relevant methodological category. Any discrepancies were discussed to reach consensus. Quality assessment scores are presented as a fraction (Table 1), to illustrate the number of quality criteria assessed and met.

Results

Searches

Searches of all sources retrieved $n = 365$ records; of these, 43 were full text reviewed, resulting in five papers being included for review. The outcomes of all searches are reported in Fig. 1.

Characteristics of included studies

Table 1 presents an overview of the characteristics of included studies.

Standardised hoarding disorder outcome measures

As identified within this systematic review of the literature, there are a range of standardised outcome measures that are used in the included studies, which are described further below. The SI-R (Frost *et al.*, 2004) is a 23-item questionnaire. This measure includes three subscales: clutter, difficulty discarding, and excessive acquisition. This measure is often used to inform diagnostic classification in HD. The clinical cut-off on this measure is 41 for the total score, with scores at or above this being suggestive of HD.

The Clutter Image Rating CIR (Frost *et al.*, 2008) is an image-based scale which is used to aid assessment of clutter severity. Three residential rooms are the focus of this measure – living rooms, kitchens, and bedrooms. The CIR consists of nine numbered images for each room, with an increase in number correlating with an increase in clutter. The CIR can be used as self-report, or used by an external observer. On the CIR, a score of 4 or higher suggests an individual may need support for clutter linked to their HD.

The Hoarding Rating Scale (HRS; Tolin *et al.*, 2010) is a 5-item questionnaire, which assesses clutter, difficulty discarding, excessive acquisition and the consequent distress and impairment. A clinical cut-off score of 14 has been recommended in the literature (Tolin *et al.*, 2010), and is commonly utilised within research as a criterion for meeting HD diagnostic criteria.

The Health Obstacles Mental health Endangerment Structure and safety Risk Assessment Tool (HOMES; Bratiotis *et al.*, 2011) allows for structured assessment of risk in hoarded homes. The tool considers risks of the impact of multiple psychosocial factors including safety of the home, risks to health and wellbeing of the person with HD and their family, as well as mental health factors.

Across the studies the most commonly used standardised outcome measures were the Saving Inventory-Revised (SI-R; $n = 1$; Frost *et al.*, 2004), the Clutter Image Rating (CIR; $n = 4$; Frost *et al.*, 2008) and the Hoarding Rating Scale (HRS; $n = 1$; Tolin *et al.*, 2010). The HOMES ($n = 1$; Bratiotis *et al.*, 2011) was used as an assessment measure in one study, and was not repeated at discharge (Metropolitan Boston Housing Partnership, 2015).

Participants

HD diagnosis was confirmed using the Structured Interview for Hoarding Disorder ($n = 2$; Millen *et al.*, 2020; Pittman *et al.*, 2021), or by professional inspection of the participant's home residence, which may include measures such as the CIR ($n = 3$; Kwok *et al.*, 2018; Kysow *et al.*, 2020; Metropolitan Boston Housing Partnership, 2015). Only one study specified that their aim was to recruit a sample of older adults (age 60 years; Pittman *et al.*, 2021). However, across studies, the mean age was 62.46 years, categorising participants on average as older adults. Across the five

Table 1. Characteristics of included studies

Reference	Participant diagnostic assessment	Location; setting; intervention; <i>n</i>	Intervention target	% Female	Mean age (<i>SD</i>)	Study design	Professionals involved	Primary outcomes	Secondary outcomes	MMAT score
Kwok <i>et al.</i> (2018)	At least moderately severe hoarding as determined by fire inspector and healthcare worker on initial visit to residence	Canada; community; HART; <i>n</i> = 421	Promote public health and safety, maintain housing stability, connect clients with services	41	64 (14)	Service evaluation/ retrospective database study/ exploratory data analysis	Fire inspector, healthcare workers, property use inspector	Number of fire code violations, case duration, case resolution (fire safety outcomes – no concerns, no longer at residence, legal action)	Enforcement type (formal/informal), challenge rating	3/5
Kysow <i>et al.</i> (2020)	At least moderately severe hoarding as determined by fire inspector and healthcare worker on initial visit to residence, CIR	Canada; community; HART; <i>n</i> = 82	Promote public health and safety, maintain housing stability, connect clients with services	56	68 (12)	Service evaluation/ retrospective database study/ exploratory data analysis	Fire prevention officer, psychiatric nurse, fire captain, clinical health supervisor	CIR, Case Outcome (harm reduction – safety and housing stability), Case duration	Cancellations, number of home visits	4/5
Metropolitan Boston Housing Partnership (2015)	Intake assessment (including HOMES, CIR)	USA; community; HI/ TPP; <i>n</i> = 175	Sorting and organising skill development, harm reduction, support compliance with health and safety	61	Between 45 and 64	Service evaluation/ retrospective database study/ exploratory data analysis	Case manager	HOMES Risk Assessment Tool, CIR, Outcome (health and safety standards), housing security	Compliance classification	5/5
Millen <i>et al.</i> (2020)	Structured Interview for Hoarding Disorder, concern regarding eviction due to clutter	USA; community; Critical Time Intervention – HD; <i>n</i> = 14	Decrease symptoms of HD, reduce risk of eviction and homelessness	71	60.6 (8)	Pre–post quasi-experimental study	Case managers	SI-R, CIR, attrition, use of components of CTI-HD	Risk of eviction	3/5
Pittman <i>et al.</i> (2021)	Structured Interview for Hoarding Disorder	USA; community; CREST + case management, peer support, family psychoeducation, after-care; <i>n</i> = 37	Reducing HD symptoms such as clutter through skill development, exposure, and care management to meet other needs (e.g. social or medical needs)	68	68.73 (7.46)	Mixed-method pre–post quasi-experimental study	Psychologists, social workers, family therapist, peer support specialist	HRS, CIR	Homelessness risk (baseline), staff evaluation	3/5

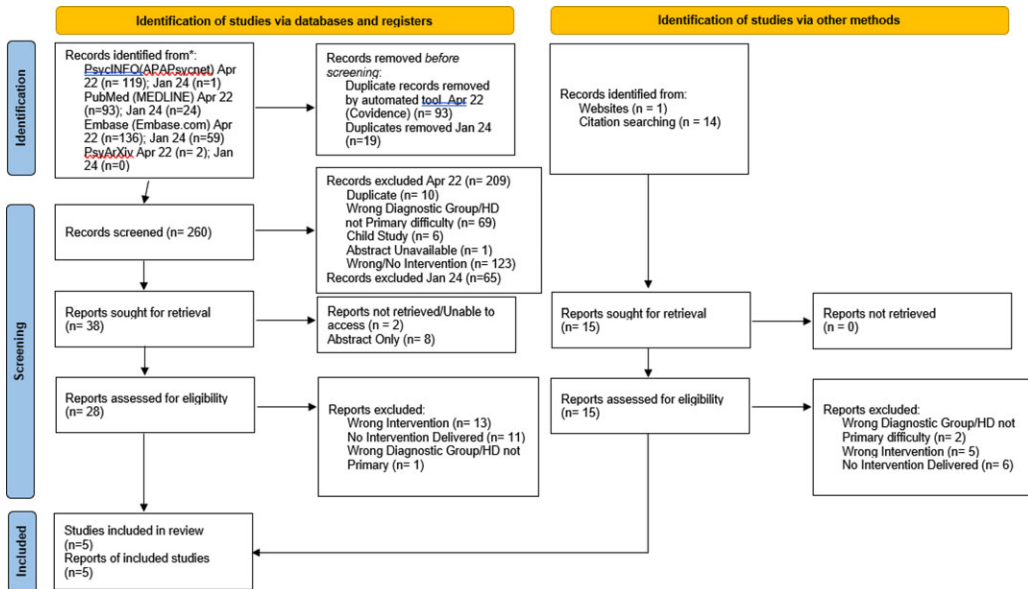


Figure 1. PRISMA 2020 diagram of study identification and selection.

studies, a majority of participants were female, with only one study having a majority male sample (Kwok *et al.*, 2018). A majority of participants were renting in three studies, but only the Metropolitan Boston Housing Partnership (2015) study focused intentionally on individuals who were renting their homes. Two studies did not state housing status (Millen *et al.*, 2020; Pittman *et al.*, 2021).

Study design and setting

No studies employed a randomised control design. Instead, all studies utilised a full or partial quantitative design, with three studies consisting of exploratory data analysis, and two pre-post quasi-experimental studies. The study which included qualitative methods ($n = 1$; Pittman *et al.*, 2021), utilised mixed methods. All studies utilised community-based samples.

Quality appraisal of included studies

Table 1 presents the summary quality assessment score for included studies. All studies passed the two screening questions of the MMAT (Hong *et al.*, 2018). Overall, the quality of studies was good, with all studies meeting at least three out of five of the quality assessment criteria.

A total of four different interventions were identified across the included studies. The Hoarding Action Response Team (HART) model was utilised in two studies (Kwok *et al.*, 2018; Kysow *et al.*, 2020). Other interventions included Hoarding Intervention and Tenancy Preservation Project (HI/TTP; Metropolitan Boston Housing Partnership, 2015), Critical Time Intervention-HD (CTI-HD; Millen *et al.*, 2020) and Cognitive Rehabilitation and Exposure/Sorting Therapy (CREST) Community Program (CCP; Pittman *et al.*, 2021). Table 2 presents an overview of the characteristics of the four included interventions.

Table 2. Characteristics of included interventions

Name of intervention	Description of intervention	Time span and mode of delivery
Hoarding Action Response Team (HART) model (Kwok <i>et al.</i> , 2018; Kysow <i>et al.</i> , 2020)	Harm reduction and case management approach. Relationship building, goal setting and service coordination. Telephone outreach, motivation building and problem solving, in-person home visits. Fire code monitoring, linking client with health services, liaison with other stakeholders and advocacy	Individual mode of delivery. Frequency of meeting dependent on participant request, with an aim of monthly (Kysow <i>et al.</i> , 2020). Median duration of intervention was between approximately 4.5 months (Kwok <i>et al.</i> , 2018) and approximately 9 months (Kysow <i>et al.</i> , 2020)
Hoarding Intervention and Tenancy Preservation Project (HI/TPP; Metropolitan Boston Housing Partnership, 2015)	Meetings with case managers to aid skill development for managing possessions, and to help sort and discard items to reduce clutter. Individualised case management processes, referrals to community partners and ongoing monitoring (post successful inspection) are also factored into the intervention	Individual weekly or biweekly meetings over an average period of 6 months
Critical Time Intervention-HD (CTI-HD; Millen <i>et al.</i> , 2020)	Six treatments and services were offered as part of CTI-HD. These included facilitated self-help group therapy, legal support, decluttering support, psychiatric assessment, coordinating family and support networks, as well as support with accessing relevant benefits. Phase 1 (3 months) – engage and build rapport with clients. This includes assessment, referrals for self-help groups, and weekly home visits and weekly check-ins to assess progress on decluttering. Phase 2 (4 months) – check-in every 2 weeks, determine support network functioning, adjust plans as needed. Consider risk of relapse and build hope for avoiding relapse. Phase 3 (2 months) – optimise support networks, one check-in per month, plan endings	Individual mode of delivery (some group components if opt-in), with the three phases of the intervention completed over a 9-month period. Individual check-ins are phased out over the course of the three phases
Cognitive Rehabilitation and Exposure/Sorting Therapy (CREST) Community Program (CCP; Pittman <i>et al.</i> , 2021)	This intervention included compensatory cognitive training (memory, planning, problem solving, cognitive flexibility; approx. 7 sessions) and exposure to discard). Relapse prevention planning is also typically included within CREST. The team was allocated time for care management, peer support, after-care groups and family psychoeducation	Individual weekly sessions, with opportunity to engage in peer support, after-care groups and family psychoeducation. Optimally between 20 and 40 sessions of CREST dependent on severity of presentation

Practitioners involved in the interventions

Three studies reported multi-disciplinary teams of professionals delivering the interventions (Kwok *et al.*, 2018; Kysow *et al.*, 2020; Pittman *et al.*, 2021). Such teams consisted of psychologists and family therapists (Pittman *et al.*, 2021), registered psychiatric nurses ($n = 1$; Kwok *et al.*, 2018), fire officers ($n = 2$; Kwok *et al.*, 2018; Kysow *et al.*, 2020), peer support workers ($n = 1$; Pittman *et al.*, 2021), healthcare workers ($n = 1$; Kwok *et al.*, 2018), social workers ($n = 1$; Pittman *et al.*, 2021), clinical health supervisors ($n = 1$; Kysow *et al.*, 2020) and property inspectors ($n = 1$; Kwok *et al.*, 2018). However, two studies (Metropolitan Boston Housing Partnership, 2015; Millen *et al.*, 2020) did not distinguish professional background, classifying practitioners as ‘case managers’.

Control conditions

None of the included studies utilised control groups or comparator interventions.

Effectiveness of the interventions

Effectiveness data have been separated based on the primary and any additional outcome measures used within each report. Table 3 presents available pre- and post-data for primary and secondary outcomes, with effect sizes presented where available. Attrition information is also presented where provided within the included studies.

Effect size data were not available or calculable for three of the five studies. Of the two studies where data were available, effect sizes were large (see Table 3). The interventions of both Kysow *et al.* (2020) and Pittman *et al.* (2021) showed a large effect size for reduction in clutter, with Pittman *et al.* also showing a large impact on hoarding symptomology. Attrition was relatively consistent across the studies (20–22%), except for Kwok *et al.* (2018) where it was reported to be zero, likely due to the mandatory nature of fire legislation enforcement. The most effective intervention based on eviction rates was CTI-HD, where no participants were evicted (Millen *et al.*, 2020), although the sample was very small ($n = 14$).

In all studies, the risk of homelessness was identified. However, this was only a primary outcome for three of the five studies (Kwok *et al.*, 2018; Kysow *et al.*, 2020; Metropolitan Boston Housing Partnership, 2015), with one study considering this a secondary outcome (Millen *et al.*, 2020), and the other only collecting homelessness risk data at baseline (Pittman *et al.*, 2021). One study did not declare evictions (CCP; Pittman *et al.*, 2021), and one had no evictions within their sample (Millen *et al.*, 2020). Both of these quasi-experimental studies acknowledged risk of homelessness within their sample, with the CTI-HD intervention specifying that the risk was still present post-intervention. This suggests that the change may not have been clinically significant, as the mean score on the CIR (mean change from 6 to 5) had not reduced below the clinical cut-off of 4. This supports the authors’ assertion that despite there being evidence of positive impact upon eviction, and hoarding symptoms, alternative and more effective treatments are needed for individuals with HD. In contrast to this, the large samples from service evaluations of HART ($n = 503$) and HI/TPP ($n = 175$) show a broader view on eviction and homelessness despite intervention. The data suggest that HI/TPP is up to 98% successful in preventing eviction (Metropolitan Boston Housing Partnership, 2015), with the results from HART suggesting 90% (Kysow *et al.*, 2020) to 87% (Kwok *et al.*, 2018) success. For those evictions that took place, 75% began at too late a stage for the intervention to make enough change to prevent or delay proceedings (Kysow *et al.*, 2020), or the participants withdrew from the intervention (Metropolitan Boston Housing Partnership, 2015).

Table 3. Effectiveness and attrition rates for included studies

Intervention and study reference	Pre-data	Post-data	Attrition <i>n</i> (%)	Effect sizes
HART (Kwok et al., 2018)	Fire Code violations (frequency, percent of cases), <i>n</i> = 332	Final case resolutions <i>n</i> = 210 171 (81%) = satisfactory, no fire safety concerns. 27 (13%) = occupant not returning. 12 (6%) = legal action to enforce fire safety	0 due to mandatory enforcement	Data unavailable to calculate
HART (Kysow et al., 2020)	CIR: Total = 6.4 (<i>SD</i> = 1.2)	CIR: Total = 3.8 (<i>SD</i> = 1.7) Case outcome: (82 total): Goals met = 52 (65%), Withdrew = 17 (21.2%), Moved = 4 (5%), Evicted = 4 (5%), Died = 3 (3.8%)	17 (20.7)	CIR: <i>d</i> = 1.41
HI/TPP (Metropolitan Boston Housing Partnership, 2015)	Average CIR across rooms = 4.1	Average CIR across rooms of 2.4 (only those who passed included) 58% = met compliance standards (passed) Two people evicted (severe HD, early termination of involvement) 20% still involved with project Success rate (no eviction) = 98%	Not stated (approx. 22)	Data unavailable to calculate
Critical Time Intervention-HD (Millen et al., 2020)	SI-R – scores from figure = approx. 67 Average CIR: 6	SI-R – scores from figure 3 months = approx. 58, 6 months = approx. 56, 9 months = approx. 52 No eviction – however continued risk of eviction for clients Average CIR: 5	3 (20)	Data unavailable to calculate
CREST + case management + family psychoeducation (CCP; Pittman et al., 2021)	CIR = 3.89 (<i>SD</i> = 1.12); HRS = 5.45 (<i>SD</i> = 1.34)	CIR = 2.79 (1.48); HRS = 3.11 (1.56)	8 (22)	CIR: <i>d</i> = 0.86 HRS: <i>d</i> = 1.18

Discussion

The aim of this systematic review was to investigate and synthesise the available literature on psychosocial interventions for individuals with HD, how and who delivers such interventions, and how effective these interventions are. Five studies were included detailing four interventions. These interventions were delivered by teams of multi-disciplinary professionals ($n=3$) or case managers ($n=2$). Whilst none of the interventions included in this systematic review was designed based on the CBT model for HD, this conceptualisation underpins the current understanding of HD. We will therefore draw on the CBT model for HD to illustrate the areas of the model that psychosocial interventions target. Thus, when applying the model, the psychosocial interventions can be viewed as targeting three components of the CBT model for HD (Frost and Hartl, 1996; Steketee and Frost, 2007): vulnerabilities; cognitive difficulties; and saving and acquiring. However, a distinction in the focus should be noted, with psychosocial interventions impacting upon the consequences of hoarding rather than precipitating factors. It is therefore likely to be important for psychosocial and CBT interventions to be used in conjunction.

A previous meta-analysis of CBT for hoarding suggested a large effect size for total HD severity (Tolin *et al.*, 2015), but acknowledged the lack of clinically significant change within the samples. A more recent meta-analysis (Rodgers *et al.*, 2021) found a larger mean effect size for CBT for HD ($g=1.25$) but did not consider whether the change for participants within these studies was clinically significant. The results from the present review suggest that psychosocial interventions can produce large effects sizes for positive change in levels of clutter (Kysow *et al.*, 2020 and Pittman *et al.*, 2021) and hoarding symptomology (Pittman *et al.*, 2021) that are comparable to similar outcomes from CBT interventions. This is promising, as it suggests that psychosocial interventions can produce similar change for participants to CBT interventions in addition to affecting change in other outcome areas such as eviction rates. Reducing housing evictions is a key outcome within most of the included studies in this review. The results show the importance of multi-disciplinary interventions for individuals with HD, as through specialised support, individuals could improve their safety and their living conditions to a level where they could withdraw or be discharged from the service. The HART (Kysow *et al.*, 2020) and HI/TPP (Metropolitan Boston Housing Partnership, 2015) interventions provide further evidence for the impact of psychosocial intervention on the home; scores on the Clutter Image Ratings Scale (Frost *et al.*, 2008) reduced from the clinical to the non-clinical range in both studies. Psychosocial interventions appear to produce observable change in the participants' environments, reducing risk to safety and improving access to cooking and washing facilities. In line with Maslow's hierarchy of needs (Maslow, 1943), this may then enable individuals to engage more successfully with psychological interventions such as CBT following a psychosocial intervention.

In studies of CBT for HD, attrition rates are variable. Some studies have reported attrition of approximately 33% (Gillam *et al.*, 2011), with others declaring no participant withdrawal (Ayers *et al.*, 2011). A recent randomised trial found attrition rates for the CBT condition of 26% (Tolin *et al.*, 2019). In this trial, 17% of participants were removed for non-compliance, whereas 9% made the choice to withdraw (Tolin *et al.*, 2019). An investigation of attrition rates in HD (Ayers *et al.*, 2018) found that baseline clutter ratings, combined with denial of hoarding as a problem, predicted attrition. Attrition rates for the studies included in this review ranged from 0 to 22%. Across the studies, where reported, participant withdrawal occurred due to factors including potential pre-contemplative stage of change (limited acceptance of severity, consequences of HD, and harm to self; Metropolitan Boston Housing Partnership, 2015), motivation difficulties (Metropolitan Boston Housing Partnership, 2015; Pittman *et al.*, 2021), engagement difficulties (Kwok *et al.*, 2018; Kysow *et al.*, 2020; Pittman *et al.*, 2021), health issues (Pittman *et al.*, 2021) and emotional impact (Metropolitan Boston Housing Partnership, 2015) of the intervention. Due to the motivational and pre-contemplative stage of change difficulties associated with withdrawal, it may be beneficial to consider augmenting the psychosocial interventions included in this review

with motivational interviewing (Rollnick and Miller, 1995) for those who are more ambivalent about change.

Studies generally presented demographic data for the samples, with comparisons to local population demographics where available (Kwok *et al.*, 2018; Kysow *et al.*, 2020; Metropolitan Boston Housing Partnership, 2015), to consider whether they were meeting the needs of the local population, or if any demographic groups were missed. Such demographic observation led to expansion of the CCP intervention to include Spanish-speaking staff (Pittman *et al.*, 2021). However, there were some inherent limits for studies based on eligibility criteria or service level agreements such as participant economic status (Metropolitan Boston Housing Partnership, 2015; Pittman *et al.*, 2021) and severity of hoarding presentation (Kwok *et al.*, 2018; Kysow *et al.*, 2020). Included participants may have been influenced by the referral methods for the studies, with older adults, for example, being more likely to be involved with social care services.

Participants within these samples were older than is typical for the populations in which they live, therefore age is an important factor to consider in relation to HD and symptom severity. In HD, there is typically an increase in severity of HD presentation as age increases (Ayers *et al.*, 2010), potentially influenced by the available time for clutter to accumulate. Without treatment, HD presentations typically worsen over time, and be exacerbated by difficulties typically associated older adulthood, such as cognitive difficulties (Ayers *et al.*, 2016) and loss of social support (Mackin *et al.*, 2011). Older adults with HD are more likely to have increased difficulties attributable to hoarding, such as an increase in clutter volume (Ayers *et al.*, 2015). It is therefore unsurprising that participants in the included studies were primarily adults from older age groups (60+). More significant difficulties are more likely to be identified and referrals made to specialist services, as supported by the help seeking in HD literature (Eckfield and Wallhagen, 2013; Mackin *et al.*, 2011). As both cognitive difficulties and loss of social support are implicated in ageing HD populations, it makes sense that psychosocial interventions may produce a significant impact. However, it would be useful to investigate whether individuals with reduced social support would self-select for psychosocial interventions if service coordination and access is promoted.

A limitation of many of the psychosocial interventions is that they are not based upon any particular theory. However, the outcomes are understandable when considered in the context of CBT conceptualisations of HD (e.g. Steketee and Frost, 2007). As depicted in Fig. 2, the psychosocial interventions identified enacted change in three areas of the CBT model for HD: vulnerabilities, cognitive processes and difficulties, and saving and acquiring. It is likely that these changes may also have influenced the emotional experiences, beliefs and meanings around hoarding, although these were not directly targeted by the interventions.

In the CBT for hoarding model, vulnerabilities include early life experiences, genetic factors, familial and social influences. All included studies target the familial and social influences component of the vulnerabilities. Three of the five studies included aspects which coordinated or educated families and support networks (Kysow *et al.*, 2020; Millen *et al.*, 2020; Pittman *et al.*, 2021). All of the interventions aimed to support the individual to access services, benefits and support (Kwok *et al.*, 2018; Kysow *et al.*, 2020; Metropolitan Boston Housing Partnership, 2015; Millen *et al.*, 2020; Pittman *et al.*, 2021). All studies provided additional social interaction through involvement in the intervention and meetings with professionals.

Cognitive processes and difficulties associated with HD are incorporated within the CBT for hoarding model. This was not considered within all the included studies. The CCP (Pittman *et al.*, 2021) intervention included seven sessions of compensatory cognitive training, which included memory, planning, problem solving, and cognitive flexibility. HI/TPP specifically identified incorporated developing skills and strategies for organising (Metropolitan Boston Housing Partnership, 2015), with other interventions not specifically including cognitive strategies, unless included within optional self-help groups (Millen *et al.*, 2020).

Saving and acquiring are two of the most visible difficulties in HD, contributing to challenging levels of clutter. All interventions included components aimed to influence this aspect of the

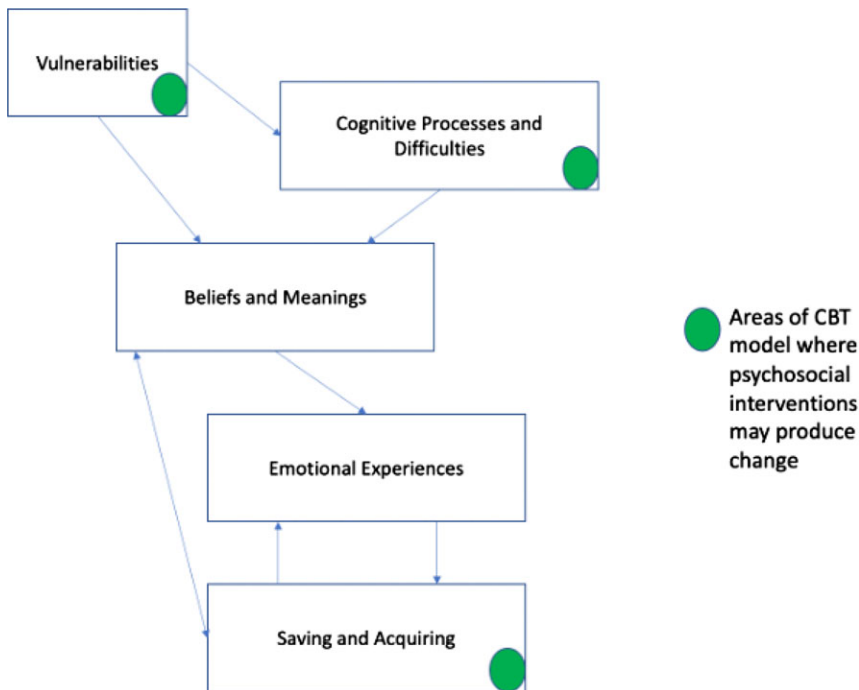


Figure 2. CBT model for hoarding, with additions indicating where psychosocial approaches may intervene and encourage change (adapted from Steketee and Frost, 2007).

hoarding model. Exposure to discard is implicit within interventions for hoarding where an individual needs to reduce the impact of clutter on their lives. Within the included studies, two provided structured support for discard as standard (Metropolitan Boston Housing Partnership, 2015; Pittman *et al.*, 2021) or as an optional component of the intervention (Millen *et al.*, 2020). It was not specified within the HART interventions whether support for discard and clutter reduction was included; however, participants were able to request motivational and problem-solving support related to discard (Kysow *et al.*, 2020), and clean-outs occurred independently for 28.9% of participants (Kysow *et al.*, 2020).

Limitations

Due to the methodological heterogeneity (study design, components of intervention and outcomes assessed), and data reporting deficits, meta-analysis was not possible.

The quality of the studies within this review was generally good with all included studies meeting at least 3/5 quality assessment criteria. However, a particular deficit to note is the inconsistency in data reported, with a lack of applicable effect sizes presented, and some studies not presenting numerical data (Millen *et al.*, 2020), or not providing the data needed to calculate effect sizes (Kwok *et al.*, 2018; Metropolitan Boston Housing Partnership, 2015). Whilst these studies have illustrated the work that is being done by services to support individuals with HD, reporting effectiveness is vital to ensure comprehensive evaluation of interventions.

Implications for future research

Research in the field of HD is limited. Whilst it has begun to develop and expand, there is substantial room for further research that employs rigorous methodologies (Bratiotis *et al.*, 2021)

Whilst location specific programmes like HI/TPP and HART have formalised and clarified their psychosocial intervention processes, HD is a global and cross-cultural problem (Fernández de la Cruz *et al.*, 2016). There is opportunity for exploratory data analysis, or intervention development, in a multitude of regions and areas of expertise.

Additional and longitudinal service evaluations are needed. There has been limited data collected on long-term effectiveness of psychosocial interventions, with studies generally presenting follow-up periods with a maximum of 6 months in duration (Rodgers *et al.*, 2021). To consider effectiveness over time, longer follow up periods (e.g. 1–5 years post intervention) are required. Studies should consider whether any of the original service users re-present in subsequent analysis periods. Similarly, there is an absence of randomised control trials comparing psychosocial interventions against routine care and/or alternative interventions such as CBT.

Most participants identified within this review were older adults, with additional difficulties in relation to their psychosocial functioning and social support associated with age. It would therefore be pertinent to consider the implications of earlier intervention for individuals with HD and trial psychosocial interventions for adults of working age.

This review has highlighted the effectiveness of psychosocial interventions for people with HD. Future research, which considers both psychological and psychosocial interventions, and the order in which these are delivered, may help to produce coherent and integrative practitioner guidance.

Implications for policy and practice

It is important to consider the cost of HD to services, and how the integration of psychosocial interventions may impact this. Whilst analysis of cost aspects of psychosocial interventions was beyond the scope of this review, in the UK, data collected from local housing providers in the North-East region suggests a potential cost of more than £1.5 million over one year, for fewer than 150 identified individuals with HD (Neave *et al.*, 2017). Further costs in the region of £100,000 per year was attributed to HD by local fire and rescue services.

There is limited information regarding cost-effectiveness of the psychosocial interventions. However, the HI/TPP project presented a cost of around \$1800 USD (Metropolitan Boston Housing Partnership, 2015) per client for longer term cases, and planned to expand the service. The CCP (Pittman *et al.*, 2021) and HART (Kysow *et al.*, 2020) interventions were both extended beyond their original term.

When looking at services such as HART and HI/TPP, focused on tenancy preservation, there were high levels of success of avoiding eviction (98%; Metropolitan Boston Housing Partnership, 2015). For these studies, the reduction in other hoarding-related symptoms linking to the CBT model of hoarding was secondary to a reduction in clutter and improvement in living environment.

Conclusion

The efficacy of CBT for HD is modest (Tolin *et al.*, 2015), therefore interventions that go beyond the standard CBT paradigm are important for CBT therapists to know about to guide practice, either in considering different approaches as alternative or adjunctive interventions to CBT. This systematic review indicates preliminary evidence to suggest that psychosocial interventions can support people with HD to enact change to prevent homelessness or eviction. However, substantial further research and evaluation is needed to aid the development of best practice guidelines for HD.

Key practice points

- (1) There is evidence for the effectiveness of psychosocial interventions across a range of outcomes and beyond those typically measured in CBT intervention studies.
- (2) When providing therapy for hoarding difficulties, CBT practitioners should consider working as part of a multi-disciplinary team.
- (3) There are similarities in the targets and methods of psychosocial and CBT interventions for hoarding disorder. However, differences lie in how they are delivered and by whom.
- (4) Further research is needed to develop the evidence base for psychosocial interventions for hoarding disorder and in particular there is a need for randomised control trials comparing this approach with routine care and/or active interventions, such as CBT.

Further reading

Bratiotis, C., Muroff, J., & Lin, N. X. Y. (2021). Hoarding disorder: development in conceptualization, intervention, and evaluation. *Focus*, 19, 392–404. <https://doi.org/10.1176/appi.focus.20210016>

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Supplementary material. To view supplementary material for this article, please visit <https://doi.org/10.1017/S1754470X24000357>

Data availability statement. The authors confirm that the data supporting the findings of this systematic review are available within the article and its Supplementary material.

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*Indicates studies included in the systematic review

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