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Assessment, treatment and the importance of early intervention of childhood hoarding

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Review Article

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Abstract

Hoarding disorder (HD) is characterised by difficulties in discharging or parting with possessions irrespective of their actual value, urges to save and acquire new items and excessive clutter in living areas. There is an urgent need to advance the understanding of HD in child and adolescent populations. The aim of this paper is to cover the assessment, treatment strategies and tools currently available. In general, data on assessment of paediatric HD are scant. Only one psychometrically sound scale, the Child Savings Inventory, which is a parent-rated scale used to assess the severity of hoarding symptoms, was found. However, this scale is not sufficient to produce a diagnosis of HD. Regarding treatment, there was only a limited number of case studies suggesting the effectiveness of cognitive behavioural therapy that includes exposure to discarding and not collecting new items, using contingency management for exposure and oppositional behaviour, cognitive training and instructing parents to assist with home-based exposures. In conclusion, there is an urgent need for properly validated Diagnostic and Statistical Manual of Mental Disorders assessment tools, and we encourage practitioners and researchers to develop and test a Cognitive behavioral therapy (CBT) protocol for paediatric HD based on the aforementioned components.

Introduction

Diagnosis

Since the release of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), hoarding disorder (HD) has been described as a distinct diagnosis (American Psychiatric Association [APA], 2013) for which the following criteria must be fulfilled: (A) persistent difficulty in discarding or parting with possessions, regardless of their actual value; (B) perceived need to save items and distress associated with discarding them; (C) accumulation of possessions that clutter the active living area, and if these areas are uncluttered, it is because of the intervention of a third party; (D) the hoarding causes significant distress or impairment in one or more areas of functioning; (E) hoarding is not attributable to another medical condition and (F) cannot be explained away by symptoms of another mental disorder, such as obsessive compulsive disorder (OCD). Two specifiers are also defined: excessive acquisition and level of insight (good or fair insight, poor insight or delusional) (American Psychiatric Association [APA], 2013). Excessive acquisition is seen in up to 85% of patients with HD (Frost et al., 2009), and youths with hoarding have been shown to have reduced insight (Storch et al., 2007). Although HD is now seen as a disorder on its own, hoarding can still be seen as a part of another disorder such as OCD, if the hoarding behaviour is driven by obsessions. In that case, an HD diagnosis would not be given.

Before the publication of DSM-5, hoarding was stated as one of the criteria for obsessive compulsive personality disorder (OCPD) in Diagnostic and Statistical Manual of Mental Disorders, fourth edition, text revision and defined as the inability to discard worn out or worthless objects, also when no sentimental value was attached to them (APA, 2013). Hoarding was not directly expressed as a symptom of OCD in this version of DSM; however, in the section about differential diagnosis between OCPD and OCD, it was stated that when hoarding is severe, an OCD diagnosis should be considered. This was particularly problematic for clinicians if patients had symptoms of hoarding but showed no other symptoms of OCD (Mataix-Cols et al., 2010). Although HD first entered the DSM in 2013, it was already hypothesised as an independent disorder in 1996 (Frost & Hartl, 1996; Zaboski et al., 2019).

Prevalence

Limited research is available regarding the prevalence of clinically significant hoarding symptoms in children and adolescents, but so far only one study has evaluated this and found the prevalence to be 2% (95% CI 1.6–2.5%) in a sample of 3,974 15-year-old twins (Ivanov et al., 2013). Results from this study also found the prevalence to be significantly higher in girls compared with boys, and if the clutter criterion from DSM-5 was excluded, the prevalence rate reached 3.7% (95% CI

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3.1–4.3%) (Ivanov et al., 2013). In a large community sample ($N = 16,718$) of youths aged 6–17 years, hoarding symptoms were found in almost 10% of participants (Burton et al., 2016). For younger children the prevalence is uncertain, but a large study questioning parents about their children's hoarding behaviours found that 10% of children were reported to have some form of need to collect or store many or useless objects (Alvarenga et al., 2015). It remains unclear how many of these children displaying hoarding symptoms fulfil the diagnostic criteria for HD.

Hoarding in children and adolescents with OCD has been extensively studied and the prevalence is usually found to be between 20% and 40% (Højgaard et al., 2019; Morris et al., 2016). Even in children with OCD under the age of 10 years, hoarding has been found to affect about 50% (Frank et al., 2014). However, since hoarding assessment in OCD populations is usually performed by using the Children's Yale-Brown Obsessive-Compulsive Scale (CY-BOCS) or other OCD-specific measures, little is known about hoarding outside OCD in these populations.

In adults, the prevalence of HD has been estimated to be 2.5% (CI 1.7–3.6%), but this estimate is based on 11 studies including a total of 53,378 participants, published in a recent meta-analysis (Postlethwaite et al., 2019). A study has also found hoarding prevalence to increase linearly by 20% every five years after the age of 15 with no observed gender differences (Cath et al., 2017).

Age of onset

In a recent meta-analysis, the mean age of onset for HD was found to be 16.7 years of age (Zaboski et al., 2019); however, since hoarding was considered a part of OCD before the DSM-5, it is possible that children and adolescents suffering from HD without meeting the criteria for OCD are unaccounted for in the included studies. The average age of onset may therefore be lower. In a case series, study investigators found that hoarding symptoms started before the age of 8 in all six cases and an unusual attachment to belongings appeared before the age of 3 in one of the cases (Plimpton et al., 2009), but ownership has been established in children as young as 2 years old (Kritikos et al., 2020). This early onset is supported by a study on children with OCD under the age of 10 years in which about 50% were affected by hoarding symptoms (Frank et al., 2014). However, compulsive symptoms are normally seen in young children (Evans et al., 1997), and hoarding symptoms can be seen in up to 60% of normal children at the age of 6 years (Leckman & Bloch, 2008). Also, no severity rating of the hoarding symptoms is normally available in studies based on OCD samples, and therefore it is unclear how many actually suffer from clinically significant hoarding or HD at these young ages. When examined retrospectively, the mean age of onset has been found to be around 13 years of age (Grisham et al., 2006). Studies that utilise properly validated assessment tools for HD in paediatric samples that are capable of distinguishing between HD and age appropriate hoarding in children are therefore needed in order to fully understand the nature of hoarding in this age group and to better ensure a timely and suitable treatment when needed.

Comorbidity in hoarding disorder

Although HD has been classified as a disorder on its own since the DSM-5, it can co-occur with OCD. However, due to the lack of systematic assessment of HD in child and adolescent populations, the rate of OCD in HD is unclear. In adult samples where criteria for HD have been met, the rate of OCD has been found to be between 37.5% and 56.7% (Frost et al., 2004; Grisham et al., 2007; Pertusa et al., 2008). However, the rate of OCD in HD has been found to be lower when samples are recruited directly from the community, or less than 18% (Frost et al., 2011).

Comorbidity with other disorders has mainly been investigated in samples of children and adolescents with OCD. Children and adolescents with OCD who display hoarding symptoms have been found to be at higher risk for comorbidity with tic disorders (Højgaard et al., 2019), autism symptoms (Boerema et al., 2019) and internalising and externalising symptoms (Storch et al., 2007), although results are inconsistent. Attention deficit hyperactivity disorder (ADHD) rates have been found to be elevated in childhood-onset OCD compared to the general population with a strong relationship between hoarding and ADHD (Sheppard et al., 2010). This finding was further supported in a study that found hoarding symptoms to correlate with ADHD and tic symptoms (Torres et al., 2016). Hoarding symptoms have also been found to correlate with inattention in a mixed sample of patients with Gilles de la Tourette Disorder (Huisman-van Dijk et al., 2016) and in a sample of children and adolescents with ADHD (Hacker et al., 2016), where both inattention and hyperactivity/impulsivity were uniquely associated with specific hoarding features.

In a sample of 204 children aged 7–13 with autism spectrum disorder (ASD) and comorbid anxiety or OCD symptoms, around 34% were found to present with moderate levels of hoarding, while 7% had severe to extreme levels of hoarding (Hacker et al., 2016). This rate has previously been found to be 24.3% in a sample of 4–7-year-olds with ASD (Scahill et al., 2014).

Aims

Based on existing literature, we know that symptoms of hoarding often start in childhood with a possible peak around the age of 13 years and have a tendency to exacerbate over time if left untreated. It has also been shown that when left untreated, HD can have serious consequences for the individual in the form of reduced quality of life and functioning for those suffering from the disorders (Tolin et al., 2019) as well as their family members (Tolin et al., 2008). The social burden of HD may also be considerable (Tolin et al., 2008). Therefore, early assessment and intervention of hoarding in children and adolescents are of utmost importance. This paper will cover assessment and treatment strategies that are currently available for children and adolescents with HD as well as treatment options available. A PubMed search was conducted on February 1st, 2020, using the medical subject heading term 'hoarding disorder', 'child' and 'adolescent'. We also searched for 'hoarding symptoms'. Furthermore, recent papers, reviews and expert guidelines were studied to find any relevant additional publications. Results are organised into an assessment and treatment sections with the following subsections for assessment (a) hoarding-specific assessment for children and adolescents, (b) non-specific hoarding assessments for children and adolescents and (c) hoarding-specific assessments for adults. The treatment subsections are (a) treatment for paediatric OCD with hoarding symptoms, (b) treatment for paediatric hoarding disorder and (c) pharmacological treatment.

Assessment

Despite limited knowledge about HD in young populations, there are strong indications that HD can also appear in children and adolescents in the absence of OCD or other psychiatric disorders. However, in order to properly evaluate the prevalence in children

and adolescents and to fully recognise the clinical presentation of HD in these age groups, more studies are needed on large samples of children and adolescents who have been assessed with validated assessments capturing the age appropriate hoarding symptoms in this group. Because collecting and saving behaviours are often seen as age appropriate behaviour in children, it is important that the instrument used for HD assessment takes this into account. Also, children often have limited insight into their symptoms, which further complicates the assessment. Furthermore, children and adolescents usually live with their parents or under the supervision of adults, which limits their ability to accumulate possessions, masking the most obvious symptom of HD and limiting the impact of HD on their daily functioning and quality of life. The DSM-5 criteria does account for this by stating that this criterion need not be fulfilled if the living areas are uncluttered due to a third-party intervention (APA, 2013). When assessing children for HD, it is also of value to evaluate the nature of their attachment to things they find difficult to discharge since the nature of this attachment often causes severe distress as they can feel they are hurting or damaging the items at stake. The behavioural reactions to discharging items also often lead to negative behavioural reactions in children (Plimpton et al., 2009). Based on these deviations in child and adolescent HD compared with adult HD, assessment developed for adults should not be directly used for younger age groups. Rather than focusing on clutter, it has been suggested that assessment of HD in young populations should be shifted towards information processing deficits and the nature of their attachment to items (Plimpton et al., 2009; Storch, Rahman, et al., 2011).

Because of the historical tradition of seeing hoarding as part of OCD, hoarding symptoms have mostly been rated with OCD-specific assessments such as the CY-BOCS. In these instruments, hoarding symptoms are usually rated with very few non-specific questions about hoarding, with no estimate of the severity of the symptoms apart from a few exceptions. Also, although hoarding symptoms are known to also co-occur with other psychiatric disorders in the absence of OCD (Mataix-Cols et al., 2010), they are mostly not assessed in standardised disorder-specific instruments. Very few studies have been published regarding the assessment of HD in children and adolescents in non-OCD samples. The reason might be that to date no clinician-administered diagnostic tool is available for the assessment of HD in children and adolescents, and the DSM-5 version of The Schedule for Affective Disorders and Schizophrenia-Present and Lifetime Version (K-SADS-PL) (Kaufman et al., 1997) does not include a chapter on HD. However, a child version of the Diagnostic Interview for Anxiety, Mood and OCD and Related Neuropsychiatric Disorders that includes a section on HD is under development (Tolin et al., 2018).

Hoarding-specific assessment for children and adolescents

To date, the only instrument available for the assessment of HD severity in child and adolescent samples is the Child Savings Inventory (CSI) (Storch, Muroff, et al., 2011). The CSI is based on the Saving Inventory-Revised for adults (SI-R) (Frost et al., 2004) and includes 23 parent-rated items. Each item is answered on a five-point Likert scale: (none, a little/minimal, some/moderate, most/much, almost all/completely), with a total score based on all 23 items (Storch, Muroff, et al., 2011). The preliminary investigation of the psychometric properties of the CSI found a four-factor structure; Discarding, Clutter, Acquisition and Distress/Impairment with good internal consistency for the factors as well as the total scale score (Storch, Muroff, et al., 2011). The discarding subscale questions are aimed at measuring distress or interference associated with discarding items (e.g., 'To what extent does your child have difficulty throwing things away that s/he does not need?'). Clutter contains items designed to evaluate the clutter in the child's/adolescent's living areas along with the associated distress (e.g., 'How much of your child's room (or where s/he sleeps, plays, etc.) is cluttered with possessions?'). The acquisition subscale covers items related to the urge to purchase or acquire items (e.g., 'How much control does your child have over his/her urges to acquire possessions that s/he does not need?'). The distress/impairment subscale includes multiple distress and interference items (e.g., 'How distressing does your child find the task of throwing things away?').

The factor structure of a shortened 20-item CSI version was later tested on a sample of Canadian youths, aged 8–17 years ($N = 191$) and diagnosed with OCD, but the initial four-factor structure was not confirmed (Soreni et al., 2018). However, after removing all the acquisition items and subjecting the remaining items to an exploratory factor analysis, a strong three-factor solution based on 15 items (CSI-15) was found (difficulty discarding, clutter and distress/impairment) which possessed acceptable convergent, construct and discriminant validity (Soreni et al., 2018). No other studies have evaluated the psychometric properties of the CSI to date. The biggest limitation of the CSI is that its psychometric properties have only been evaluated in samples of children and adolescents diagnosed with OCD. Since HD may present differently in the absence of OCD or any comorbid disorders, or when exhibited with comorbid disorders other than OCD, it is important to evaluate the psychometric properties of the CSI in these types of samples. Another limitation of the CSI is that it cannot be used as a diagnostic utility since no cut-off scores have been identified that could help identify those with and without a clinical HD according to the DSM-IV. Finally, as the CSI is a parent-rated instrument, it is subject to the limitations of such instruments and a clinician-rated instrument that encompasses both the child's *and* parents' answers would be a more accurate tool in the assessment and diagnosis of HD.

Another instrument worth mentioning is the Compulsive Hoarding in Children: Semi-Structured Interview, developed by Plimpton et al. (2009). The interview was developed to assess the range and type of hoarding behaviours in children and includes 27 questions focused on the symptoms of hoarding behaviour, their effects on the child, onset and fluctuations in symptoms, associated problems such as ADHD and perfectionism, the child's own explanations for his/her behaviour and finally about his/her family history of hoarding and OCD. However, it has only been utilised in a paper reporting on six case studies (Plimpton et al., 2009).

Non-specific hoarding assessments for children and adolescents

There are several assessments available that measure hoarding symptoms in combination with symptoms of OCD. The common denominator for most of these assessments is that they are limited in the range of hoarding symptoms and therefore do not assess all the domains central to hoarding and they do not provide a severity rating of hoarding independently of other OCD symptoms.

The golden standard in OCD assessment is the CY-BOCS (Scahill et al., 1997), but it is a clinician-administered, semi-structured interview that includes both a symptom checklist and a severity scale based on ten questions. The symptom checklist includes a host of items divided to several symptom categories, both for obsessions

and compulsions. Hoarding is included as a checklist category, but only includes two items ('Fear of losing things' and 'Difficulty throwing things away, saving bits of paper, string, etc.'), with the added option of registering other symptoms of hoarding in an open text format (Scahill et al., 1997). The severity is based on combined OCD symptoms and therefore it provided limited information about the severity of hoarding symptoms on their own.

Another common instrument in this category is the Obsessive Compulsive Inventory-Child Version (OCI-CV) (Foa et al., 2010). The OCI-CV is, however, a child self-report measure of OCD symptoms and includes hoarding as one of its six subscales. Its advantages over the CY-BOCS is that it includes more hoarding-related items that better capture the different elements of hoarding, unlike the CY-BOCS that merely captures general hoarding obsessions and compulsions. However, due to its low number of items and no hoarding-specific severity estimation, its usefulness is also very limited in assessment and diagnosis of HD.

The Children's Obsessional Compulsive Inventory (Shafran et al., 2003) and the Children's Florida Obsessive–Compulsive Scale (Storch et al., 2009) are also well suited and commonly used self-reports designed to assess OCD symptoms and severity. They also include hoarding-related items, but just like the CY-BOCS and the OCI-CV they are limited in the range of hoarding symptoms and do not evaluate the severity of hoarding symptoms in isolation from other OCD symptoms.

Hoarding-specific assessments for adults

During our search, we found much more data on adult HD scales. For instance, The Hoarding Scale (HS) is a 21-item self-report and was the first instrument designed to assess hoarding symptoms based on the current theoretical model of hoarding (Frost & Gross, 1993). The items included in the HS cover discarding behaviours, emotional reactions to discarding, worries about later having to use discarded items and sentimental attachment to possessions (Frost & Gross, 1993). However, the assessment does not assess excessive acquisition, or a proper rating of distress and impairment related to hoarding (Steketee et al., 2003). The HS was later adapted for use in children and adolescents and named CSI (Storch, Muroff, et al., 2011).

The SI-R was later developed to address some of the limitations of the HS (Frost et al., 2004). The SI-R is a 23-item self-report questionnaire in which items are rated on a 5-point Likert scale (0–4), with a minimum score of 0 and a maximum score of 92. The items were divided into three subscales (a) excessive acquisition of purchased and free items, (b) saving and discarding behaviours and (c) excessive clutter as a result of these behaviours (Frost et al., 2004). The psychometric properties of the SI-R are well established (Frost et al., 2004), and it has also been found to be sensitive to change following cognitive behavioural therapy of hoarding (Steketee et al., 2010).

A short questionnaire named the Hoarding Assessment Scale was developed to quickly assess the severity of the core elements of hoarding (Schneider et al., 2008). It includes four items that measure difficulty discarding, clutter, acquisition and interferences/distress and has been found to have generally positive psychometric properties (Schneider et al., 2008).

In addition to the aforementioned self-rating scales, several interview-based assessments are available that measure hoarding symptoms in adults. Two semi-structured interviews have been developed, the Hoarding Rating Scale-Interview (HRS-I) (Tolin et al., 2010), and the UCLA Hoarding Severity Scale (UHSS) (Saxena et al., 2007). The interviews are similar, but the UHSS includes additional items assessing indecisiveness, procrastination, perfectionism and slowness of task completion in addition to the measures of clutter, difficulty discarding, excessive acquisition and the level of distress and impairment items included in the HRS-I. The HRS-I also has a self-report equivalent version called the Hoarding Rating Scale-Self-Report (HRS-SR) (Tolin et al., 2008). The HRS-SR has been adapted to better suit adolescents by referring only to the adolescent's own bedroom rather than all the rooms of the house/apartment where the adolescent has limited influence and was found to have acceptable internal consistency (Ivanov et al., 2013).

Finally, the Structured Interview for Hoarding Disorder (SIHD) was designed for adults, based on the HRS-I and the DSM-5 diagnostic criteria for HD (Nordsletten et al., 2013). One of the strengths of the SIHD is that it also includes questions to rule out hoarding behaviour due to other medical conditions or disorders (Morris et al., 2016). The SIHD has been used to diagnose HD in a sample of adolescents from 16 years of age (Mataix-Cols et al., 2013), but an adaptation of the interview for use with children and younger adolescents is needed.

In conclusion, all these instruments are based on situations specific to adults with HD and, except for HS that was adapted for use with children and adolescents under the name of CSI, none of them have been adapted or evaluated in child samples although some adaptation for adolescent samples has been made. Thus, they all have none or limited utility in assessing HD symptoms in youths.

Treatment of hoarding disorder

Cognitive behavioral therapy (CBT) protocols for adult HD have been developed (Muroff et al., 2014; Tolin et al., 2017). According to a systematic review and meta-analysis by Tolin and colleagues (Tolin et al., 2015) that combined results from 12 distinct HD samples, treatment is effective with large pre to post effect size for hoarding severity reduction ($g = 0.82$) and moderate effect size for hoarding-related impairment reduction ($g = 0.52$) (Tolin et al., 2015). Only one randomised controlled trial was found, comparing 12 weekly CBT sessions with a similar sized group on a wait-list and showing moderate effect size (Steketee et al., 2010).

The protocol by Tolin and colleagues suggests seven interrelated targets for HD treatment in adults and ways to address them. (1) Decision-making problems (e.g., deciding how to sort and which items to discard) which may be because of high levels of indecisiveness (Frost et al., 2011; Samuels et al., 2002). The protocol suggests a structured plan for regular sorting and discarding (rehabilitate). It also suggests simplifying the decision-making process so patients may decide whether to donate, discard/recycle or keep items, thus minimising and compensating for potential executive functioning deficits. (2) Maladaptive beliefs about different possessions and discarding are frequent in HD. For instance, an overwhelming sense of responsibility for certain items (Frost et al., 1995), or strong fear of losing important information or aversion to wastefulness, thus accumulating items just in case that they are needed in the future or a need to maintain control over certain items. The main strategy to target these maladaptive ideas is cognitive restructuring. For instance, by examining the evidence for and against a certain belief, and if needed, conducting behavioural experiments to test the accuracy of certain thoughts. (3) Difficulties of regulating emotions may also be a problem in HD, thus when

discarding items patients may react very emotionally. For instance, sadness or depression could reveal their emotional attachment when discarding. Certain items may also be related to a certain place, person or past activity (Kellett & Holden, 2014; Steketee et al., 2003). Patients are taught about emotions, how they affect us and about identifying emotions properly. The protocol stresses emotional distress tolerance and includes strategies from acceptance and commitment therapy (Hayes, 2016). In addition, exposure exercises are implemented as the patient gradually confronts these anxiety-provoking triggers. (4) Avoidance behaviour (e.g., avoiding discarding items as it evokes strong emotional reactions such as fear) can be responsible for the maintenance of HD symptoms. Avoidance and noncompliance need to be addressed constantly within and between sessions. (5) Impulsivity can also be responsible for collecting and saving items. It may be enjoyable, and it brings about positive emotions and cognitions (e.g., it is exciting, and I feel that I am economical or thrifty) (Rasmussen et al., 2013). Thus, the protocol included contingency management interventions used in substance abuse and compulsive buying treatments. For instance, focusing on triggers for collecting items. These may include specific situations, moods and specific items. Individuals are also encouraged to avoid these high-risk situations. Stimulus control is an important component in refraining from collecting items (challenging questions about usefulness and refrain temporarily). (6) Poor insight and motivation to change may also attribute to the maintenance of HD (Frost et al., 2010; Tolin et al., 2010). Tolin et al. suggest using motivational interviewing (MI) (Miller & Rollnick, 2013) to create ambivalence which may motivate the HD patient for beneficial behavioural changes. Direct confrontation and argumentation are refrained when applying MI. (7) Poor organisational skills are also frequent in this group (Hartl et al., 2004; Woody et al., 2014). For instance, the HD patients do not necessarily keep their items according to their categories (e.g., clothes in the wardrobe), thus making the initial sorting and discarding work much more difficult. It is thus important to teach organisational strategies as well.

Treatment for paediatric OCD with hoarding symptoms

The main bulk of research on OCD treatment effects for people with OCD and hoarding symptoms has been conducted with adults, showing that CBT outcome is in general poor compared to other symptoms of OCD (Bloch et al., 2014). In this meta-analysis, only two youth studies were included with aligning results. Since then, three additional studies with large sample sizes have been published, all showing that youths with OCD and hoarding symptoms do not fare worse than youths with OCD without hoarding following CBT (Højgaard et al., 2019; Masi et al., 2009; Olino et al., 2011; Rozenman et al., 2019; Storch, Rahman, et al., 2011).

Treatment for paediatric hoarding disorder

No large-scale data have been published on the treatment for paediatric hoarding disorder. However, six case studies were found reporting on treatment for n = 7 individuals (Ale et al., 2014; Andersen & Thomsen, 2017; Gallo et al., 2013; McKay, 2016; Plimpton et al., 2009; Storch, Rahman, et al., 2011).

The extent to which adult HD treatment protocols have been adapted is not clear (Steketee et al., 2010; Tolin et al., 2007). The available case studies suggest that the following CBT components are frequently used: (1) the inclusion and training of parents, (2) E/RP, (3) contingency management (CM) and (4) cognitive training and strategies, which will all be described in detail below. However, before treatment initiation, we would recommend a thorough diagnostic and behavioural assessment.

(1) Including parents in treatment is probably necessary for paediatric HD. Data suggest that the amount of home assistance is associated with successful treatment results in adult HD treatment (Muroff et al., 2012; Tolin et al., 2015). All the available case studies describe a significant role of parents (Ale et al., 2014; Andersen & Thomsen, 2017; Gallo et al., 2013; McKay, 2016; Plimpton et al., 2009; Storch, Rahman et al., 2011). Parents may assist in treatment in a number of ways, such as assist with and facilitate treatment assignments and homework (e.g., discarding and sorting tasks). In addition, they can be taught specific behavioural strategies included in treatment and in turn teach and encourage their youngsters to use these strategies outside of sessions. Parents may also use behavioural strategies when needed to address oppositional defiant behaviour or treatment noncompliance when it occurs.
(2) Exposure to discarding possessions and not collecting new items are considered to be essential in adult HD (Muroff et al., 2014; Steketee et al., 2010; Tolin et al., 2017). This strategy is also described in the paediatric case studies that were found. The adult HD protocols and the available paediatric HD case studies describe the development of a hierarchy of discarding and accumulation of items. The child is instructed to rank these activities according to difficulties. The child then progresses from the current state, in small incremental goals, to the end goal of complete removal of clutter and discarding without significant difficulties.
(3) Using contingency management may also be essential in order to control oppositional and disruptive behaviour (e.g., anger outbursts or violence) and to motivate exposure exercises and appropriate discarding and non-acquiring behaviour (e.g., sorting and discarding). Unacceptable behaviours may result in response cost (loss of token/privileges). On the other hand, children are rewarded when initiating positive behaviours, such as participating in exposure or discarding.

Cognitive training and related strategies are also useful. Cognitive restructuring may be used to re-evaluate and modify thoughts which are responsible for hoarding behaviour. For instance, as described in Storch et al. (2011), when a patient with excessive hoarding of food items because of fear of being hungry and starving was instructed to generate statements about food availability. The patient was also asked about her previous experiences of being hungry, for instance, periods when she was hungry for a short period of time but was given food eventually. She was also instructed to evaluate the likelihood of being left without the opportunity to eat. As a cognitive strategy, children need to be taught problem-solving skills to resolve problems that they might encounter and to identify alternative strategies. A common approach to problem-solving is to use didactic instruction modelling and role playing. For instance, by using the acronym RIBEYE to describe the problem solving steps: (1) relax, (2) identify the problem, (3) brainstorm potential solutions, (4) evaluate solutions, (5) say Yes to the best solution and (6) encourage yourself for completion (Rohde et al., 2005).

Training youths in decision-making may also be an important strategy to reduce and discard clutter. Children are taught to sort items into a small number of categories according to relevance.

In conclusion, we would encourage practitioners and researchers to adapt a CBT adult HD protocol to paediatric HD and to collaborate across sites for feasibility and efficacy evaluation. The limited data suggest that paediatric HD is prevalent. As data on adults with HD suggest that early onset is common, early identification and treatment are necessary.

Pharmacological treatment

Psychopharmacological treatments might also be considered for youths with HD. Only one case study was found that reported on the effective treatment of fluoxetine and risperidone along with exposure treatment that resulted in remission for a 15-year-old girl with OCD and hoarding symptoms (Sockalingam & Zemans, 2007). In adult HD, studies are very scant. Only one meta-analysis exists, showing a mean response of 58% (95% CI 37%–76%) of 92 adult HD patients in seven studies. Treatment consisted of serotonin reuptake inhibitors, venlafaxine, methylphenidate and augmentation of serotonin reuptake inhibitor (SRI) with quetiapine, minocycline and naltrexone (Brakoulias et al., 2015). A more recent review shows that there are currently no future studies aiming at testing drugs in HD (Piacentino et al., 2019).

It is often necessary to consider appropriate pharmacological treatments for comorbid disorders, of which ADHD and OCD are likely the most common in youths. Thus, SRI treatment for OCD and stimulant medication for ADHD might have direct and indirect effects in HD. For instance, when a child with HD and ADHD is given treatment with stimulants, it might also have reduced attention deficits, thus increasing the child's ability to organise and sort different items (Pliszka & AACAP Work Group on Quality Issues, 2007; Rodriguez et al., 2013). It has been reported that adult HD is associated with attentional problems which may have an impact on the treatment of HD (Huisman-van Dijk et al., 2016).

For OCD and HD, SRIs medication might reduce obsessional worries which trigger collecting and acquisition. However, the existing data on adult OCD with hoarding symptoms have shown that they respond worse than OCD with hoarding following selective serotonin reuptake inhibitor (SSRI) treatment (Bloch et al., 2010; Mataix-Cols et al., 1999). However, these studies did not report on specific hoarding symptom outcome.

Conclusion

Hoarding symptoms are seen in child and adolescent populations and the average age of onset seems to be in early adolescence. Due to the influence of parents, hoarding-related clutter may be limited in young populations and little is known about child and adolescent hoarding outside of OCD populations. There is an urgent need for properly validated assessment tools based on the DSM-5 criteria for use in child and adolescent populations in order to advance our knowledge on HD in these populations. Hoarding symptoms may be milder in youth but are known to become more severe with age, therefore early identification and prevention by using proper assessment and treatment when symptoms start to emerge are important. The limited number of case studies suggest a CBT strategy which comprises four interrelated components: (1) using parents as co-therapists, (2) exposure to discarding and not collecting new items, (3) using contingency management for exposure and oppositional/disruptive behaviour and (4) cognitive training. We encourage practitioners and researchers to develop a CBT protocol and collaborate across sites for feasibility and efficacy evaluation of a CBT protocol for paediatric HD.

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