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ORIGINAL ARTICLE

Skills training groups for men with ADHD in compulsory care due to substance use disorder: a feasibility study

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Abstract Dialectical behavior therapy (DBT)-based skills training has been developed and previously evaluated for adults with ADHD in a psychiatric outpatient context. The aim of the present study was to evaluate the feasibility of DBT-based skills training as a voluntary intervention for men with ADHD in compulsory care due to severe substance abuse. Forty sufficiently detoxified men with ADHD in compulsory care due to life-threatening substance use disorder (SUD) were included in DBT-based skills training groups. Self- and staff-rating scales were administered before and after the treatment. The refusal rate was 42.9 %. Of those who started the DBT-based skills training, 70 % completed the treatment (attendance at ≥75 % of the sessions). The treatment acceptability was good. Both ADHD and psychiatric symptoms decreased from pre- to post-intervention in self-ratings, but not in staff ratings. The patients reported improved general well-being. The correlation between self- and staff ratings was poor. Motivation for voluntary nonpharmacological treatment was low in a compulsory care context. However, the results indicate that a DBT-based skills training program for adults with ADHD may be feasible for some patients with ADHD in combination with SUD in compulsory care, provided that considerable resources are allocated with adjustments to the target group and compulsory care context.

Keywords ADHD · Substance use disorder · Behavior therapy · Skills training · Group therapy · Compulsory care · Mandatory care

Introduction

Attention deficit hyperactivity disorder (ADHD) is a childhood onset, heritable neurodevelopmental disorder (Faraone et al. 2005; Larsson et al. 2014) which persists into adulthood in the majority of cases. ADHD is characterized by inattention, distractibility, hyperactivity, and low impulse control. Executive dysfunctions such as problems with planning, organizing, initiating, and completing activities are often associated with ADHD (Fuermaier et al. 2014; Spencer et al. 2007). Furthermore, ADHD is associated with considerable functional impairments in practically all domains of life (Biederman et al. 2006; de Schipper et al. 2015; Torgersen et al. 2006) and high psychiatric comorbidity (Biederman et al. 1993; Torgersen et al. 2006). Substance use disorder (SUD) is one of the most common comorbid conditions in adults with ADHD (Busch et al. 2002; Faraone et al. 2012; Fayyad et al. 2007; Klassen et al. 2010; Masi et al. 2003; Wilens et al. 2009).

The estimated prevalence of ADHD in individuals with SUD (ADHD/SUD) is 20–50 % (Gordon et al. 2004; Sullivan and Rudnik-Levin 2001; van Emmerik-van

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Oortmerssen et al. 2012), compared to 2–4 % in the general population (Fayyad et al. 2007). Conversely, the prevalence of SUD among ADHD patients has been estimated to be approximately 50 % (Sullivan and Rudnik-Levin 2001; Wilens 2011).

In Sweden, there is legislation within the Social Services Act pertaining to compulsory care for individuals with severe substance abuse, i.e., the Care of Substance Abusers Act (Special Provision) (Proposition 1987/88:147). The National Board of Institutional Care (*Swedish abbreviation, SiS*) is the authority responsible for all compulsory care governed by the Social Services Act. Approximately 1000 individuals per year are required to undergo compulsory inpatient care for severe and, in the majority of cases, life-threatening substance abuse (National Board of Institutional Care 2014). There are 11 inpatient SiS institutions throughout the country, and this authority decides on the patient placements. The legislated duration of compulsory care due to substance abuse is 6 months. The purpose of the compulsory care is to discontinue life-threatening substance use and to motivate for voluntary care. Compulsory care is based on multimodal treatment methods. Nonpharmacological treatment can include motivational interviewing, relapse prevention, structured discussion groups, and brief individual psychotherapy, which may be given in various combinations depending on each individual's treatment needs and motivation.

Pharmacological treatment is effective in reducing the core ADHD symptoms in patients with ADHD without SUD (Bitter et al. 2012; Faraone et al. 2004; Koesters et al. 2009; Meszaros et al. 2009). However, discontinuation of and nonadherence to ADHD medication are common outcomes (Adler and Nierenberg 2010; Castells et al. 2013; Gualtieri et al. 1985; Mattes et al. 1984; Zetterqvist et al. 2013), which may indicate insufficient symptom reduction and/or adverse effects of the ADHD medication (Wilens et al. 2002). Furthermore, pharmacological treatment does not fully target the executive and psychosocial dysfunctions (Knouse et al. 2008; Wilens et al. 2002; Young and Gudjonsson 2008). Hence, disorder-specific nonpharmacological interventions may be needed in order to improve strategies to cope with ADHD-related impairments. This may be especially important in ADHD/SUD patients on which pharmacological treatment has an uncertain effect (Castells et al. 2011; Chang et al. 2014; Cunill et al. 2014; Matthys et al. 2013; Wilens et al. 2005). Moreover, we observed in a previous study that accessibility to pharmacological treatment was poor among men with ADHD who had been in compulsory care due to SUD (Bihlar Muld et al. 2015), which is probably attributable to the controversies related to risks found regarding pharmacological treatment in patients with combined ADHD/SUD. The risks of treatment with stimulants that have been discussed are associated with the abuse potential, i.e., misuse of the prescribed stimulants, side-abuse, and diversion (Bukstein 2008; Faraone and Wilens 2007; Klassen et al. 2012; Kollins 2008; Mariani and Levin 2007; de Los Cobos et al. 2012; Sepulveda et al. 2011).

In clinical guidelines (Bolea-Alamanac et al. 2014; Kooij et al. 2010; National Board of Health 2014), multimodal treatment combining pharmacological and nonpharmacological intervention is recommended for individuals with ADHD.

A few randomized controlled studies have shown promising results for different types of behavior therapy for adults with ADHD (Emilsson et al. 2011; Hirvikoski et al. 2011; Safren et al. 2010; Solanto et al. 2010; Stevenson et al. 2002, 2003; Weiss et al. 2012). Psychoeducation may also be beneficial for individuals with ADHD (Vidal et al. 2013), including psychoeducational programs that involve significant others (Hirvikoski et al. 2015). However, in these studies, patients with severe SUD have been excluded. Moreover, current psychotherapeutic programs are not adjusted for the clinical characteristics of the combined ADHD and SUD group. Adult men with ADHD in compulsory care due to SUD are characterized by early antisocial behavior and poor cognitive skills, adverse psychosocial childhood conditions, and severe functional impairments, as well as extensive comorbidity (Bihlar Muld et al. 2013, 2015).

Dialectical behavioral therapy (DBT)-based skills training groups for ADHD have been evaluated in an outpatient psychiatric context and found to be a feasible, well-tolerated and an effective treatment option for adults with ADHD (Hesslinger et al. 2002; Hirvikoski et al. 2011; Morgensterns et al. 2015; Philipsen et al. 2007, 2010, 2014). In the present study, we aimed to evaluate whether or not this treatment, modified for a target population and context, was feasible for men with ADHD in compulsory care due to SUD.

Methods

The clinical part of the study was conducted at the SiS Institution Hornö, one of 11 SiS institutions in Sweden. The target patient population of the institution is males who, in addition to severe substance abuse, have severe psychiatric disorders and/or a history of violent behavior.

The study was approved by the Regional Ethics Committee of Stockholm (42-790-2012). All patients gave their written informed consent.

Participants

All participants were in compulsory care during 2011–2014. They came from different counties in Sweden

and had been placed at the institution of a central unit of SiS. Figure 1 describes the enrollment of the study participants. The mean age of the participants was 27.5 years (SD = 8.01, range = 19–46 years). The patient characteristics, obtained from patient case files (e.g., educational level, employment status, ADHD subtype, Axis I and Axis II diagnoses, full-scale IQ, rates on the Wender Utah Rating Scale [WURS]) are described in Table 1.

The exclusion criteria were an IQ of <70, severe psychiatric comorbidity, such as psychosis, and/or suicidal behavior. Patients with a pronounced aggressive attitude, as well as patients who were not able to attend a small group, were also excluded. Patients meeting these criteria were not informed of the treatment program and were not asked to participate.

Diagnostic assessment

In previously assessed patients with an ADHD diagnosis (23 individuals, i.e., 57.5 %), the medical records were requested by the SiS Institution. These patients had been diagnosed at different ages at child or adult psychiatric services. To validate the ADHD diagnosis, all participants also completed the WURS (Ward et al. 1993) and the Current ADHD Symptom Scale—Self-Report Form (Barkley and Murphy 1998). A structured interview concerning the current life situation (Hirvikoski et al. 2009) was also conducted with all participants, including the previously diagnosed ones.

The patients who did not have a prior ADHD diagnosis were assessed at the institution. The diagnostic assessment was made by clinical psychologists and was based on multiple sources of information. The structured diagnostic interview, DIVA (Kooij and Franken 2010), the standardized self-rating questionnaires, WURS (Ward et al. 1993), and the World Health Organization Adult ADHD Self-Report Scale (ASRS) (Kessler et al. 2005) were included in the ADHD assessments. Whenever possible, collateral information (questionnaires and clinical interviews) was gathered from the participants' significant others. If available, additional information was obtained from case files from child/adolescent and/or adult psychiatry, as well as from institutions for involuntary care during childhood and/or adolescence. Neuropsychological testing was

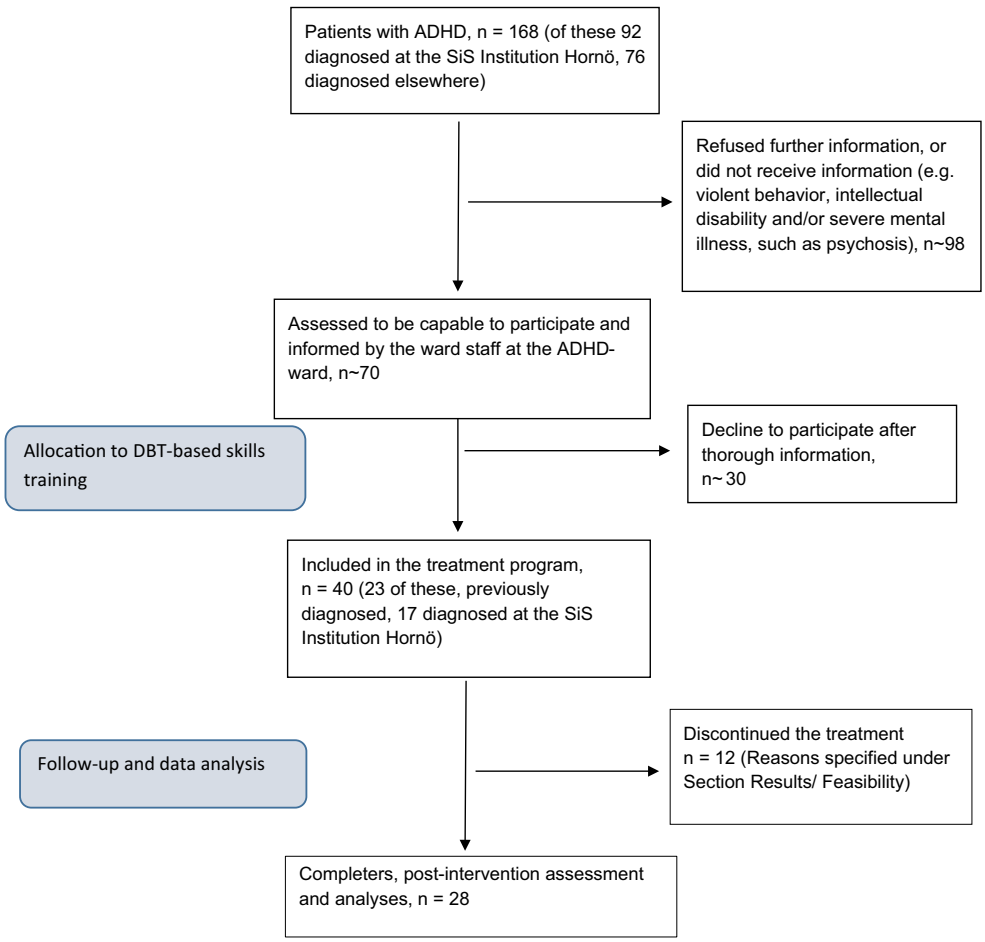

Fig. 1 Flowchart describing enrollment of the participants in the treatment program

Table 1 Characteristics of participants

Characteristics	Study participants ($n = 40$)
Age	M = 27.5, SD = 8.01, range = 19–46
Educational level	Secondary school: 8 (20.0 %)
	Primary school/9 years: 20 (50.0 %)
	Less than 9 year: 12 (30.0 %)
Employment before compulsory care	Employed: 4 (10.0 %)
	Unemployed: 21 (52.5 %)
	Sick leave or disability pension: 10 (25 %)
	Studying: 2 (5.0 %)
	Missing information: 2 (5.0 %)
Accommodation before compulsory care	Independent living: 14 (35.0 %)
	Living with parents: 4 (10.0 %)
	Living with partner and/or children 6 (15.0 %)
	No own accommodation/homeless: 13 (32.5 %)
	Missing: 3 (7.5 %)
Marital status	Married/cohabiting: 2 (5.0 %)
	Unmarried: 34 (85.0 %)
	Divorced: 4 (10.0 %)
Having children under 18 years	Yes: 10 (25.0 %), of whom one (2.5 %) live with wife and joint children
	No: 30 (75.0 %)
Assessment data	
Somatic illness at admission	Yes: 27 (67.5 %)
	No: 11 (27.5 %)
	Missing information: 2 (5.0 %)
Current pharmacological treatment for ADHD	Methylphenidate: 11 (27.5 %)
	Atomoxetine: 2 (5.0 %)
	No current ADHD medication: 27 (67.5 %)
	Previous ADHD medication: 5 (12.5 %)
Other psychoactive medication at the beginning of skills training	Neuroleptics: 12 (30.0 %)
	Anxiolytics: 19 (47.5 %)
	Antidepressive medication: 20 (50.0 %)
	Mood stabilizer: 4 (10.0 %)
	Sleep medicine: 23 (57.5 %)
	Medication for somatic problems: 16 (40.0 %)
ADHD subtype	ADHD combined: 34 (85.0 %)
	ADHD primary inattentive: 6 (15.0 %)
Establishment of the ADHD diagnosis	Diagnosed at the SiS Hornö: 17 (42.5 %)
	Previously diagnosed: 23 (57.5 %)
Years diagnosed with ADHD	Less than 12 months: 18 (45.0 %)
	13–24 month: 3 (7.5 %)
	25–36 month: 7 (17.5 %)
	More than 36 month: 12 (30 %)
Axis I diagnosis:	Depressive disorder (any form): 19 (47.5 %)
	Anxiety disorder (any form): 21 (52.5 %)
	Psychotic disorder: 3 (7.5 %)
	Psychotic episodes or drug-induced psychosis: 5 (12.5 %)

Table 1 continued

Characteristics	Study participants ($n = 40$)
Psychiatric comorbidity, Axis II	Antisocial personality disorder (ASPD): 22 (55.0 %)
	Borderline PD: 4 (10.0 %) (all have an additional ASPD diagnosis)
	Dependent/avoidant PD: 2 (5.0 %)
	Personality disorder–not otherwise specified: 6 (15.0 %) (not in combination with ASPD)
	No PD diagnosis: 7 (17.5 %)
	Missing information: 3 (7.5 %)
Other neurodevelopmental disorders	Asperger syndrome: 3 (7.5 %),
	Autistic traits: 9 (22.5 %)
Preferred abused drug as reported by the patient	Stimulants: 13 (32.5 %)
	Opiates: 13 (32.5 %)
	Cannabis: 3 (7.5 %)
	Benzodiazepines: 3 (7.5 %)
	Alcohol: 3 (7.5 %)
	Other drugs (mixed, internet drugs): 5 (12.5 %)
Positive on drug screening at admission	Benzodiazepines: 34 (85.0 %)
	Cannabis: 7 (17.5 %)
	Stimulants: 5 (12.5 %)
	Opiates/Substitution: 14 (35.0 %)
	Analgesic: 5 (12.5 %)
Full-scale IQ (Intelligence quotient)	M = 87.9, SD = 10.0, range = 70–109
Wender Utah Ratings Scale (WURS)—25	M = 62.81, SD = 15.22

Wender Utah Rating Scale (WURS) measures ADHD symptoms during childhood

included in all assessments. The diagnosis of ADHD was established after reaching a consensus among three clinical psychologists from the SiS Institution. In patients with an extensive comorbidity, the diagnosis was also discussed with a consulting psychiatrist. In the assessments of comorbid disorders, the Structured Clinical Interview for DSM Disorders (SCID-I and II) (First and Herlofson 1998a, b) was used, as well as standardized and validated rating scales and interviews: the Beck Depression Inventory (BDI) (Beck et al. 2005), the Beck Anxiety Inventory (BAI) (Beck and Steer 2005), and the Symptoms Checklist (SCL-90-R) (Degoratis and Melisaratos 1983).

Recruitment and treatment setting

All patients are placed on a detoxification ward when arriving at the SiS Institution. The length of the detoxification phase varies depending on the abused substance and the patient's physical and mental condition. After a satisfactory detoxification (e.g., when the individual no longer needs pharmacological treatment of withdrawal symptoms) and stabilization of his physical and mental state (e.g., substance use-induced hallucinations and/or aggressive behavior have declined), the patient is transferred to one of the three treatment wards at the institution.

A new treatment ward, Uppgård, intended for patients with ADHD, was established at the institution in September, 2011. The ward staff were trained in the principles of DBT-based treatment and coaching during a one-week long course including lectures and workshops (new employees recruited later on received a shorter training).

The goal was to give information on the ongoing project already on the detoxification ward and then transfer patients with a known ADHD diagnosis to the ADHD ward. The information was given by the ward staff, provided that the patient did not decline to receive information and/or was assessed as being capable of participating in a structured group treatment. However, all patients with ADHD could not be identified on the detoxification ward since the majority of them were admitted to the institution due to acute life-threatening substance use and were referred under the Emergency Care Order (National Board of Institutional Care 2014). Therefore, their medical records were requested later in the care process. Furthermore, more than 40 % of the participants did not have a prior ADHD diagnosis, but were assessed for ADHD at the

institution after the detoxification period. Thus, patients with a known ADHD (assessed as being capable of participating in the treatment program) were transferred to the ADHD ward directly from the detoxification ward, while patients assessed later (or having their diagnosis validated later) were often transferred to another ward before they received information about the treatment project and were thereafter transferred to the ADHD ward. However, patients who first agreed, but later declined to participate (after being transferred to the ADHD ward), were not transferred back to another ward.

Every participant in the treatment program was assigned to a coach (ward staffer) for daily support and motivational interventions. In order to encourage efforts with the homework and attendance at the sessions, the participants received modest rewards, mostly a preferred activity with the ward staff, such as lunch at a restaurant. The rewards could either individual or group-based and were not as systematic as in contingency management treatment (Higgins et al. 2008).

Structured skills training groups

The treatment program was based on the Swedish version (Hesslinger et al. 2010) of the original German manual (Hesslinger et al. 2004). In short, the treatment is based on dialectical behavior therapy (DBT), modified for adults with ADHD. The aim of the structured skills training program is to develop and improve skills related to ADHD symptoms and impairments. Important treatment components are psychoeducation, mindfulness training, and functional behavior analysis. The skills training program has been described in more detail in previous studies (Hesslinger et al. 2002; Hirvikoski et al. 2011).

Based on the findings in a previous study on the characteristics of ADHD/SUD patients in compulsory care (Bihlar Muld et al. 2013), as well as the clinical context of compulsory care, the treatment program has been adjusted. The treatment period was 6 weeks, with two skills training sessions per week. One of the coaches was always present at the skills training sessions. The group leaders were licensed psychologists working at SiS Institution Hornö. The contents of the manual were mainly unchanged, but the material was adjusted to facilitate the reading and understanding. The themes and content of the sessions are presented in Table 2.

Measures

Background and demographic data

Data were obtained from the assessments documented in the participants' case files.

Feasibility

The criteria for good *feasibility* were defined as the proportion of completers (attending at ≥75 % of the sessions) of the treatment being 60 % or more of the patients allocated to treatment (Hirvikoski et al. 2011).

Treatment acceptability

The Treatment Credibility Scale (TCS) (Borkovec and Nau 1972) was used to measure expectations for improvement and treatment credibility. The TCS is a visual analog scale rated from "low credibility" (0) to "high credibility" (10), and the total score was calculated as a mean of all items. The TCS was administered before the treatment, after providing thorough information and presentation of the treatment content by the project manager, as well as after completion of the treatment. The item wordings after adjustment to the current study were: (1) How logical does this type of group seem to you? (2) How confident are you that this kind of group will be successful in reducing your ADHD-related problems? (3) How confident would you be in recommending this type of group to a friend with ADHD? (4) How successful do you feel this type of group would be in the treatment of other kinds of problems? (5) How much improved do you expect that you will be from participation in this kind of group?

In completers, treatment acceptability was measured with the patient evaluation form from the manual (Hesslinger et al. 2010). The form is designed to measure the participants' confidence and satisfaction with the treatment (ADHD specificity of the treatment program; increased knowledge of ADHD; increased ability to cope with their ADHD-related impairments; experience of having opportunities to make their own suggestions during the sessions; and willingness to take part in a similar group in the future), all scored on a Likert scale from "I disagree" (1) to "I agree" (5). The evaluation also included the participants' ranking of the elements of treatment they found most helpful: the psychoeducation, the group setting, the exercises or the group leaders. Finally, the participants' summary ratings of the treatment program were measured on a scale ranging from 1 (failed) to 4 (with honor).

Efficacy-related measures

All efficacy-related measures described in this section were administered in conjunction with the start and the completion of the treatment program for all included patients (i.e., also those diagnosed previously).

The Current ADHD Symptom Scale—Self-Report Form (Barkley and Murphy 1998) and a Staff Report Form (modified from the Self-Reported Form for ward staff) both

Table 2 Themes and content of the sessions in the order employed in the study

Session	The themes and the contents
1	*Introduction* Clarification and information about ADHD symptoms. Presentation of the overall goal of the treatment and the group setting. Emphasis on the benefit of setting individual goals. Discussion of attainable and short-term goals. Presentation of the rationale for homework. Homework for the next session: Consideration of a single goal that is achievable during the compulsory care treatment period
2	*Neurobiology and mindfulness* (1) Brief psychoeducation on the neurobiology of ADHD and introduction of "what" and "how" mindfulness skills. Reasons/rationale for mindfulness exercises. Introduction of brief mindfulness exercise in observing and describing what is in the room. Continuation of goal definitions; how to break down goals into daily sub goals and to formulate goals in terms of "more or less" of an experienced problematic behavior. Homework: Similar mindfulness exercises to those in the session, but in the ward context
3	*Mindfulness* (2) *and introduction to behavior analysis* Continuation of the theme "Reasons for and the benefit of mindfulness exercises." Mindfulness exercise: To observe and describe what can be heard in the room and from the outside. Homework: A mindfulness exercise (to observe and describe the surroundings when walking outside the institutional ward)
4	*Acceptance* The dialectic balance between acceptance and change. A joint exercise in behavior analysis of a somewhat common behavior problem. Mindfulness exercise: A brief exercise focusing on breathing. Presentation of the homework: (1) To identify a circumstance, desirable to be changed, but must be accepted. (2) To identify a recently demonstrated behavior leading to negative consequences (3) To observe and describe the food in a meal situation (mindful eating)
5	*Impulsivity and impulse control* Behavioral analysis of an impulsive behavior that any of the participants would like to share with the group. Repetition of "why mindfulness exercises." Mindfulness exercise: "Breathing steps." Homework: (1) To conduct a behavior analysis of an impulsive behavior with support from the coach, (2) Mindfulness exercise "Breathing steps"
6	*Continuation of the theme mindfulness* Presentation of one of the participants' behavior analyses carried out with the coach. Mindfulness exercise: One of the previous ones. Homework: The same mindfulness exercise as in the session
7	*Emotion regulation* Brief theory of innate affective expressions, the importance of emotions as signals and in interpersonal communication, the link between emotions and cognition, and how to identify emotions. Mindfulness exercise: Body scan. Homework: (1) To identify one strong emotion that has been difficult to regulate, (2) Body-scan exercise
8	*Chaos and control* Self-selected examples of the participants' difficulties in organizing and planning their daily life. Behavior analysis on the theme "Chaos and control"; disorganized behavior that has created problems. Mindfulness exercise "Faint smile" (a tool to change emotions and mood through behavior). Homework: To plan how to decrease chaos in their room on the ADHD ward
9	*Stress management* Definition, general triggers, and individual vulnerability, physiological reactions, consequences in the long run and strategies to manage stress. Mindfulness exercise: One of the previous ones. Homework: conduct a behavior analysis of a failure to manage stress with the support of the coach
10	*Depression and anxiety and the association with ADHD* Discussions of the participants' experiences of depression and anxiety. Presentation of symptoms and treatment options (medication and psychotherapy). Presentation of the behavior analysis, carried out with the coach. Mindfulness exercise: Imagination of "thoughts as clouds" (a tool to avoid getting caught in thoughts). Homework: The same mindfulness exercise as in the session
11	*Self-respect and relationships* The impact of ADHD in these respects was discussed. Mindfulness exercise: One of the previous ones. Homework: The same awareness exercise as in the session
12	*Retrospect and outlook* Discussion of the individual goals; achievements and strategies to continue to work toward the goals

include 18 symptom items for ADHD, corresponding to the criteria for ADHD in the DSM-IV, as well as eight symptoms of externalizing behavior (such as irritability and anger outburst). The Current ADHD Symptom Scale is scored from 0 to 3. The ward staff that completed the pre-intervention ratings was the same as the one that completed the post-intervention ratings.

Instead of the long version of SCL-90 (Degoratis and Melisaratos 1983), used in the assessments, a short version of the SCL-90-R, including 16 symptom items (Hesslinger et al. 2002), was used for assessing psychiatric symptoms before and after interventions (each item being scored from 0 to 4). General well-being was measured with a visual analog scale (VAS), ranging from 0 (worst) to 10 (best) (Hesslinger et al. 2002).

Statistical analyses

Descriptive statistics were applied to demographic and background data, as well as to the measures of treatment acceptability. In the comparison between the completers and noncompleters, the Chi-squared test was used for categorical variables and the *t* test for continuous variables. The paired-samples *t* test was used to analyze changes from pre- to post-intervention, and the degrees of freedom were corrected for unequal variance if indicated by Levene's test for the equality of variance. The effect sizes for the *t* tests were expressed as Cohen's *d* (Cohen 1988) and interpreted as follows: approximately 0.30 for a "small" effect, approximately 0.50 for a "medium" effect, and $\geq$0.80 for a "large" effect. Pearson's product moment correlation was

used to study the association between self- and staff ratings. The alpha level was set at $p \leq 0.05$, and the p values ≤ 0.10 were regarded as statistical trends.

Results

Feasibility

Figure 1 describes the enrolled patients with ADHD from September 2011 to October 2014. Out of 168 patients with ADHD, 98 were not informed about the study (e.g., due to violent behavior, intellectual disability, or severe mental illness, such as psychosis) or refused further information. Out of 70 patients who received thorough information, 30 additional patients declined to participate (42.9 %). Thus, 40 patients were included in the treatment program.

Out of the 40 patients who started the DBT-based skills training, 28 (70 %) completed the treatment, all of whom had an attendance of at least 75 % of the sessions. The mean number of attendances in sessions among completers was 11.29 (SD = 1.0) (out of a maximum of 12) and, among noncompleters, 4.17 (SD = 2.0). Out of the 12 noncompleters, one participant was excluded from the treatment program by the group leaders because of severe disruptive behavior. Other reasons for discontinuation were "did not get anything out of the treatment" ($n = 3$), "too restless and/or difficulties to concentrate" ($n = 3$), was transferred to voluntary treatment in their community ($n = 2$), increasing symptoms of depression and/or anxiety ($n = 2$), and absconded from the institution ($n = 1$).

The noncompleters of the treatment program were found to have a lower educational level (completers: <9 years, $n = 4$; 9 years, $n = 16$; secondary school, $n = 8$; noncompleters: <9 years, $n = 8$; 9 years, $n = 4$; secondary school, $n = 0$; $\chi^2 = 14.5$, $p = 0.005$), more severe ADHD symptoms during childhood (WURS 25: completers: M = 58.27, SD = 11.76; noncompleters: M = 74.60, SD = 17.39, $t = -3.26$, $p = 0.003$), and more current impulsive symptoms according to the staff's ratings (the Current ADHD Symptom Scale: completers: M = 8.18, SD = 5.42; noncompleters: M = 15.45, SD = 8.96, $t = -3.11$, $p = 0.004$). No significant differences were found regarding employment status, living accommodation, marital status, somatic illness, current pharmacological treatment for ADHD, other psychoactive medication, ADHD subtype, psychiatric comorbidity [Axis I and Axis II], other neurodevelopment disorders, preferred abused drug, drug screening, or full-scale IQ (all p values >0.10). Furthermore, no significant differences were found between completers and noncompleters regarding ADHD subtypes ($p > 0.10$) or site of diagnostic assessment (the SiS Institution Hornö *versus* previous diagnosis from an outpatient clinic) ($p > 0.10$).

Treatment acceptability

Three of five separate items on the Treatment Credibility Scale (TCS) (Fig. 2) increased significantly from pre-intervention to post-intervention ["How confident are you that this kind of group will be successful in reducing your ADHD-related problems?" ($p = 0.043$, $t = -2.03$), "How confident would you be in recommending this type of group to a friend with ADHD?" ($p = 0.004$, $t = -3.17$), and "How successful do you feel this type of group would be in the treatment of other kinds of problems?" ($p = 0.018$, $t = -2.53$)]. The increase in the scores on the item "How logical does this type of group seem to you?" reached a statistical trend ($p = 0.053$, $t = -2.03$). The scores on the item "How much improved do you expect that you will be from participation in this kind of group?" were unchanged from pre- to post-intervention ($p > 0.10$). The mean sum score on all five items increased significantly from pre-intervention (M = 5.7, SD = 1.87) to post-intervention (M = 6.34, SD = 1.89) ($p = 0.021$, $t = -2.46$).

According to the ratings in the patient evaluation form, the participants perceived the treatment as being ADHD-specific (a mean score of 4.5, SD = 0.51, on a scale of 1–5). The lowest mean score, 3.2 (SD = 1.16), was

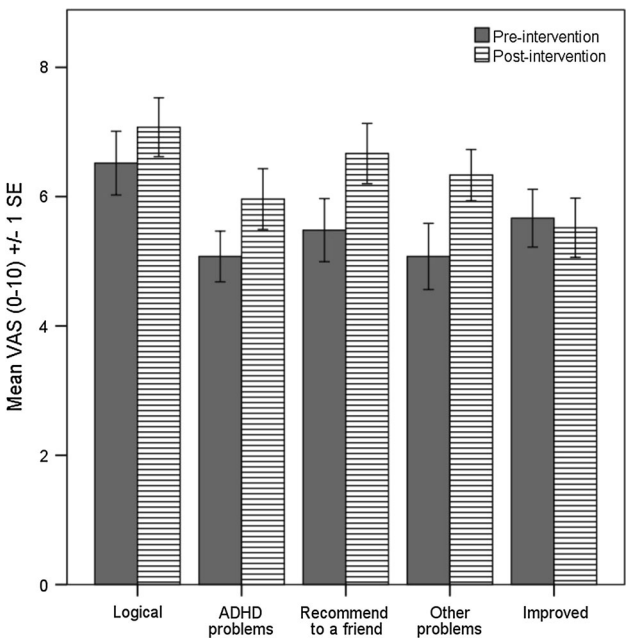

Fig. 2 Participants reported higher treatment credibility on the Treatment Credibility Scale at post-intervention as compared to pre-intervention

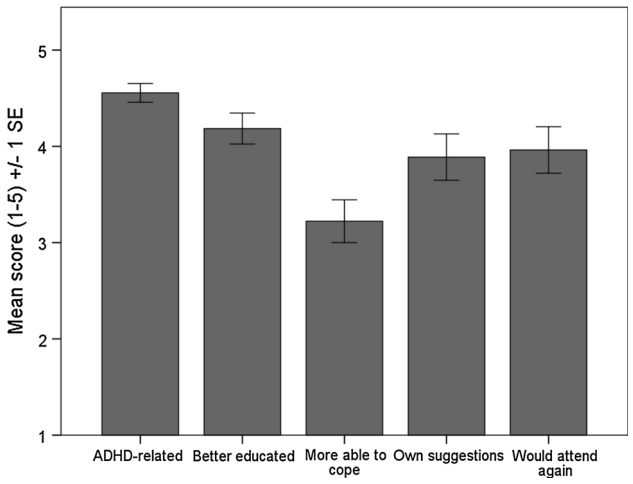

Fig. 3 Overall treatment satisfaction was good

observed for the item "Has achieved better control of the ADHD-related problems." For the other three items, the average mean score ranged between 3.89 and 4.19 (SD 1.14–1.26). The patients rated the psychoeducation as the most helpful element in the treatment and, thereafter, the group leaders, then the group setting, and, lastly, the exercises. The participants' mean summary evaluation of the treatment was 2.9 (SD = 0.85) on a scale from 1 (failed) to 4 (with honors) (Fig. 3).

Efficacy-related measures

As shown in Table 3, ADHD ($p < 0.001$) and psychiatric symptoms ($p = 0.008$) were reduced from pre- to post-intervention in the self-ratings. General well-being increased significantly ($p < 0.001$, $t = -2.87$). Contrarily, the staff reported no significant reduction of ADHD symptoms from pre- to post-intervention.

The self-ratings were significantly correlated with the ward staff ratings only regarding externalizing behavior, in both the pre- ($p = 0.02$, $r = 0.43$) and post-intervention ratings ($p = 0.\ 04$, $r = 0.39$) (Table 4).

Discussion

DBT-based skills training for adults with ADHD has been found to be feasible in a psychiatric outpatient context (Hirvikoski et al. 2011; Philipsen et al. 2014). The present study indicates that the treatment program may be feasible and acceptable for some males with ADHD in compulsory care due to severe SUD. However, considerable resource allocation (such as a separate ADHD ward, staff resources, highly involved and experienced psychologists, and complex care logistics) at the institution was required to obtain these results.

Patient characteristics

Compared to the participants included in previous studies on behavior therapies for ADHD, including DBT-based skills training, the participants in the present study differed in several respects. First of all, only males were included, all of whom were in compulsory care due to SUD, whereas previous studies involved outpatients of both sexes. Furthermore, the participants in the current study displayed more complex and multiple needs, compared to patients included in studies on outpatients focusing on psychotherapy for ADHD; lower cognitive capacity (Emilsson et al. 2011; Hirvikoski et al. 2011; Philipsen et al. 2007; Safren et al. 2005; Solanto et al. 2010; Weiss et al. 2012), and a lower educational and work experience level (Hirvikoski et al. 2011; Philipsen et al. 2014; Safren et al. 2005; Solanto et al. 2008) characterized the present study population. Furthermore, in the present study, patients with personality disorders, including antisocial personality disorder, were not excluded as in most previous studies on psychotherapy for adult ADHD (Philipsen et al. 2010; Philipsen et al. 2007; Safren et al. 2010; Solanto et al. 2010). These broad inclusion criteria were probably only possible, however, because of the institutional treatment context, extensive resource allocation on the ward, and the adjustments of the treatment. Nevertheless, most severely impaired patients (such as those with ongoing psychosis and intellectual disability) were excluded. These groups may need more individualized treatment primarily focusing on the main impairment.

The frequency of Axis I comorbidity (77.5 %, in addition to SUD) is in line with several studies on ADHD showing a comorbidity over the life span of between 65 % and 89 % (Sobanski et al. 2007) and with studies on patients with combined ADHD and SUD showing Axis I comorbidity of more than 70 % (Ginsberg et al. 2010; van Emmerik-van Oortmerssen et al. 2014). Fifty-five percent met the criteria for antisocial personality disorder, which is in line with studies on treatment-seeking patients with ADHD and SUD (51.8 %) (van Emmerik-van Oortmerssen et al. 2014).

Feasibility

The criteria for good *feasibility* were defined as the proportion of completers (attending at $\geq$ 75 % of the sessions) of the treatment being 60 % or more. This threshold was somewhat lower compared to previous studies on DBT-based skills training in a psychiatric outpatient setting (Hirvikoski et al. 2011), due to more disabling clinical characteristics in the present study cohort (Bihlar Muld et al. 2013), as well as the compulsory care setting.

Table 3 Efficacy-related outcomes pre- and post-intervention

	$N = 28$	Pre-intervention mean (SD)	Post-intervention mean (SD)	t (df)	p
Self-ratings					
ADHD symptoms: total	27	32.70 (8.30)	26.26 (8.39)	4.98 (26)	<0.001
ADHD symptoms: attention deficit	27	16.52 (4.92)	13.19 (15.20)	4.07 (26)	<0.001
ADHD symptoms: impulsivity	27	16.19 (4.54)	13.07 (4.35)	4.62 (26)	<0.001
Externalizing behavior	27	9.00 (5.52)	4.63 (4.48)	4.35 (26)	<0.001
Psychiatric symptoms (SCL-90-R)	27	31.07 (10.03)	25.26 (11.40)	2.87 (26)	0.008
General well-being	27	4.11 (2.04)	6.02 (1.60)	−4.42 (26)	<0.001
Missing data	1				
Ward staff ratings					
ADHD symptoms: total	28	17.82 (9.56)	15.57 (8.78)	1.46 (27)	0.157
ADHD symptoms: attention deficit	28	9.64 (5.42)	8.04 (5.90)	1.69 (27)	0.253
ADHD symptoms: impulsivity	28	8.18 (5.48)	7.00 (4.53)	1.50 (27)	0.146
Externalizing behavior	28	2.90 (3.06)	3.43 (3.81)	−.87 (27)	0.394

Paired-samples t test was used as statistical method

Table 4 Patients' self-ratings and ward staff ratings of ADHD symptoms correlations

	n	r	p
Pre-intervention correlations			
Total	39	0.19	0.24
Attention	39	0.04	0.83
Impulsivity	39	0.32	0.06
Externalizing behavior	36	0.43	*0.02*
Post-intervention correlations			
Total	27	0.29	0.25
Attention	27	0.20	0.33
Impulsivity	27	0.28	0.15
Externalizing behavior	27	0.39	*0.04*

Pearson's product moment correlation was used as statistical method

P-values printed in italics indicate a statistically significant difference

The interest in the treatment program among the patients was low. All reasons for refusal were not documented in detail, but our clinical experience is that motivation for voluntary nonpharmacological treatments is often low in the initial period of compulsory care. Moreover, the compulsory care *per se* is an indication of low treatment motivation, since such care is always preceded by attempts to motivate for voluntary treatments in accordance with the Swedish Social Services Act. Furthermore, many patients wanted to be transferred to more open (outpatient) forms of treatments as soon as possible (rehabilitation centers, family homes, or psychiatric outpatient care), whereas the six-week-long skills training program could extend the compulsory care time period.

In the present study, we had an attrition rate of 30 %, which is somewhat higher than that observed in an outpatient psychiatric context (Hirvikoski et al. 2011; Morgensterns et al. 2015). We found that the noncompleters, compared to completers, had a lower educational level, more childhood symptoms of ADHD, and more current symptoms of hyperactivity/impulsivity in the staff ratings. However, current ADHD symptoms were reported as the reason for discontinuation in only 3 out of 12 cases. Other reasons were dissatisfaction with the treatment, an increase in psychiatric symptoms (depression/anxiety), absconding from the institution, or transfer to a voluntary treatment setting.

Treatment acceptability

Compared to individuals with ADHD from a psychiatric outpatient clinic (Hirvikoski et al. 2011), the expectation of improvement/confidence in the treatment was considerably lower in the present patient group in both the pre- and post-ratings. This may not be surprising, given the compulsory care context and the total clinical burden in the current study group. However, the treatment expectancy/credibility increased from pre- to post-intervention, which, hopefully, may indicate an increase in the individuals' propensity to participate in future psychological treatments.

Mindfulness training has been suggested to be beneficial for individuals with ADHD, both as a component of a DBT-based skills training program (Hirvikoski et al. 2011; Philipsen 2012) and as a single treatment component (Zylowska et al. 2008). A review of conducted mindfulness-based treatment for ADHD provides evidence for the feasibility and acceptability of such training for ADHD (Mitchell et al. 2014).

In the present study group, the satisfaction with the mindfulness exercises was lower compared to what we have observed in an outpatient setting (Hirvikoski et al. 2011; Morgensterns et al. 2015), as reflected in both the patient evaluation form and the staff's reports of a low willingness to do the homework in mindfulness exercises. One conclusion may be that the patients may have needed more support between the sessions to carry out the exercises. Furthermore, Mp3 players (smartphones are not allowed at SiS Institutions) with recorded instructions could provide more support for carrying out the mindfulness exercises between the sessions and also increase the experience of independence. More education and training in mindfulness for the group leaders and ward staff could increase their ability to support the patients in carrying out the exercises.

According to the observations of both the group leaders and the coaches, the exercises in the functional behavior analysis were valued more than the mindfulness exercises. The participants reported that they experienced the functional behavior analysis as useful, especially for discovering alternative behavior for previously employed dysfunctional behaviors. At least some participants reported to the ward staff that they perceived mindfulness exercises as "pointless" or "not making sense." Moreover, mindfulness exercises may possibly be perceived as challenging perceptions of masculinity by at least some of the patients, whose most preferred activity at the institution is weight lifting and similar sports activities.

Efficacy-related measures

DBT-based skills training for ADHD has been reported to reduce self-reported ADHD symptoms in an outpatient psychiatric context (Hirvikoski et al. 2011; Philipsen et al. 2007). In the present study, in a compulsory care context, we found significant symptom reduction in all measured parameters in self-ratings. However, it may be assumed that at least part of the symptom reduction may be attributable to general/nonspecific therapeutic factors (Strupp 1986) concerning both the total care that all patients at the institution receive and the nonspecific factors in the skills training program. Moreover, the staff ratings did not confirm the positive results from the self-ratings. Furthermore, the correlation between staff ratings and self-ratings of the ADHD symptoms was not significant. The scores on self-rated ADHD symptoms in the present patient group ($M = 32.70$) were expected, based on comparisons with the scores in psychiatric outpatients ($M = 28.00$ in the total study group) using the same rating scale (Hirvikoski et al. 2011). The relatively low mean score ($M = 17.82$) in the ward staff's ratings could not be explained by the present study design. The lack of a control group complicates the interpretation of the observed results.

There are probably several explanations for the discrepancy in staff- *versus* self-ratings of symptom. One possible explanation for the higher self-ratings can be the difference between perceived and observed symptoms. The patients' perception is likely to be associated with long-standing suffering and experiences of impairments, which may be reflected in the ratings. One possible explanation for the staff's low ratings may be that symptoms such as attention deficits, inner restlessness, difficulties in concentration, and other covert symptoms are difficult to detect, especially when compared to other patients with severe externalizing symptoms.

Limitations

The lack of a control group is the major limitation in the present study. However, the primary aim was to evaluate whether the treatment program was at all feasible, given the compulsory treatment context, the severely impaired patient group, and the resource allocation demands that the treatment program made on the SiS Institution. Furthermore, although we used standardized outcome measures employed in previous studies, these instruments lack Swedish psychometric evaluation. An additional limitation is that the first information about the study was given by ward staff and the exact reasons for exclusion (e.g., violent behavior, intellectual disability, psychosis) at this stage are not known. The uncertain generalizability of the findings is also a limitation. The present study group was characterized by an extensive clinical burden, which may not characterize the total population of individuals with ADHD and SUD. Furthermore, the study context of compulsory care due to SUD has no equivalent in most other countries. However, individuals who exhibit a high symptom severity of both ADHD and SUD, in addition to comorbid psychiatric symptoms, are often found in other compulsory care settings, such as forensic care and institutional youth care, and in voluntary outpatient and inpatient addiction and psychiatric clinics (Klein et al. 1997; Rosler et al. 2004; Torok et al. 2012; Wilens et al. 2008).

Conclusions

A structured group treatment such as DBT-based skills training is feasible for some patients with ADHD in compulsory care due to SUD, provided that the program is adjusted to the patient group and the compulsory care context, and that the required resources can be allocated. The most severely impaired patients (such as individuals

with intellectual disability) may need more individualized interventions focusing on their primary diagnosis. Given the severe clinical impairment in this patient group, together with poor accessibility to pharmacotherapy (Bihlar Muld et al. 2015), alternative or complementary nonpharmacological treatments are needed. Therefore, our results are encouraging although larger studies are needed for more conclusive evidence.

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Compliance with ethical standards

Conflict of interest All authors declare no conflict of interest with regard to the current study.

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References

Adler LD, Nierenberg AA (2010) Review of medication adherence in children and adults with ADHD. Postgrad Med 122(1):184–191

Barkley RA, Murphy KR (1998) Attention-deficit hyperactivity disorder: a clinical workbook, vol 2. Guilford Press, New York

Beck AT, Steer RA (2005) Beck Anxiety Inventory (BAI), Swedish version. Stockholm: Psykologiförlaget AB, licenced by Harcourt Assessments, Inc., USA

Beck AT, Steer RA, Brown GK (2005) Beck Depression Inventory-Second Edition (BDI-II). Swedish version. Stockholm: Psykologiförlaget AB, licenced by Harcourt Assessments, Inc., USA

Biederman J, Faraone SV, Spencer T, Wilens T, Norman D, Lapey KA, Doyle A (1993) Patterns of psychiatric comorbidity, cognition, and psychosocial functioning in adults with attention deficit hyperactivity disorder. Am J Psychiatry 150(12):1792–1798

Biederman JFS, Spencer TJ, Mick E, Monuteaux MC, Aleardi M (2006) Functional impairments in adults with self-reports of diagnosed ADHD. J Clin Psychiatry 67(4):524–540

Bihlar Muld B, Jokinen J, Bolte S, Hirvikoski T (2013) Attention deficit/hyperactivity disorders with co-existing substance use disorder is characterized by early antisocial behaviour and poor cognitive skills. BMC Psychiatry 13(1):336

Bihlar Muld B, Jokinen J, Bölte S, Hirvikoski T (2015) Long-term outcomes of pharmacologically treated versus non-treated adults with ADHD and substance use disorder: a naturalistic study. J Subst Abuse Treat 51:82–90

Bitter I, Angyalosi A, Czobor P (2012) Pharmacological treatment of adult ADHD. Curr Opin Psychiatry 25(6):529–534

Bolea-Alamanac B, Nutt DJ, Adamou M, Asherson P, Bazire S, Coghill D, Consensus G (2014) Evidence-based guidelines for the pharmacological management of attention deficit hyperactivity disorder: update on recommendations from the British association for psychopharmacology. J Psychopharmacol 28(3):179–203

Borkovec TD, Nau SD (1972) Credibility of analogue therapy rationales. J Behav Ther Exp Psychiatry 3(4):257–260

Bukstein O (2008) Substance abuse in patients with attention-deficit/hyperactivity disorder. Medscape J Med 10(1):24

Busch B, Biederman J, Cohen LG, Sayer JM, Monuteaux MC, Mick E, Faraone SV (2002) Correlates of ADHD among children in pediatric and psychiatric clinics. Psychiatr Serv 53(9):1103–1111

Castells X, Ramos-Quiroga JA, Rigau D, Bosch R, Nogueira M, Vidal X, Casas M (2011) Efficacy of methylphenidate for adults with attention-deficit hyperactivity disorder: a meta-regression analysis. CNS Drugs 25(2):157–169

Castells X, Cunill R, Capella D (2013) Treatment discontinuation with methylphenidate in adults with attention deficit hyperactivity disorder: a meta-analysis of randomized clinical trials. Eur J Clin Pharmacol 69(3):347–356

Chang Z, Lichtenstein P, Halldner L, D'Onofrio B, Serlachius E, Fazel S, Larsson H (2014) Stimulant ADHD medication and risk for substance abuse. J Child Psychol Psychiatry 55(8):878–885

Cohen J (1988) Statistical power for the behavioral science, 2nd edn. Psychology Press, New York

Cunill R, Castells X, Tobias A, Capella D (2014) Pharmacological treatment of attention deficit hyperactivity disorder with co-morbid drug dependence. J Psychopharmacol 29:15–23

de Los Cobos JP, Sinol N, Perez V, Trujols J (2012) Pharmacological and clinical dilemmas of prescribing in co-morbid adult attention-deficit/hyperactivity disorder and addiction. Br J Clin Pharmacol 77(2):337–356

de Schipper E, Lundequist A, Wilteus AL, Coghill D, de Vries PJ, Granlund M, Bolte S (2015) A comprehensive scoping review of ability and disability in ADHD using the International Classification of Functioning, Disability and Health-Children and Youth Version (ICF-CY). Eur Child Adolesc Psychiatry 24:859–872

Degoratis LR, Melisaratos N (1983) The brief symptom inventory: an introductory report. Psychol Med 13:595–605

Emilsson B, Gudjonsson G, Sigurdsson JF, Baldursson G, Einarsson E, Olafsdottir H, Young S (2011) Cognitive behaviour therapy in medication-treated adults with ADHD and persistent symptoms: a randomized controlled trial. BMC Psychiatry 11:116

Faraone SV, Wilens TE (2007) Effect of stimulant medications for attention-deficit/hyperactivity disorder on later substance use and the potential for stimulant misuse, abuse, and diversion. J Clin Psychiatry 68(Suppl 11):15–22

Faraone SV, Spencer T, Aleardi M, Pagano C, Biederman J (2004) Meta-analysis of the efficacy of methylphenidate for treating adult attention-deficit/hyperactivity disorder. J Clin Psychopharmacol 24(1):24–29

Faraone SV, Perlis RH, Doyle AE, Smoller JW, Goralnick JJ, Holmgren MA, Sklar P (2005) Molecular genetics of attention-deficit/hyperactivity disorder. Biol Psychiatry 57(11):1313–1323

Faraone SV, Biederman J, Wozniak J (2012) Examining the comorbidity between attention deficit hyperactivity disorder and bipolar I disorder: a meta-analysis of family genetic studies. Am J Psychiatry 169(12):1256–1266

Fayyad J, De Graaf R, Kessler R, Alonso J, Angermeyer M, Demyttenaere K, Jin R (2007) Cross-national prevalence and correlates of adult attention-deficit hyperactivity disorder. Br J Psychiatry 190:402–409

First MB, Herlofson J (1998a) SCID-I: klinisk version. Intervjumanual. Pilgrim Press, Danderyd

First MB, Herlofson J (1998b) SCID-II: klinisk version. Intervjumanual. Pilgrim Press, Danderyd

Fuermaier AB, Tucha L, Koerts J, Aschenbrenner S, Weisbrod M, Lange KW, Tucha O (2014) Cognitive complaints of adults with attention deficit hyperactivity disorder. Clin Neuropsychol 28(7):1104–1122

Ginsberg Y, Hirvikoski T, Lindefors N (2010) Attention Deficit Hyperactivity Disorder (ADHD) among longer-term prison inmates is a prevalent, persistent and disabling disorder. BMC Psychiatry 10:112

Gordon SM, Tulak F, Troncale J (2004) Prevalence and characteristics of adolescents patients with co-occurring ADHD and substance dependence. J Addict Dis 23(4):31–40

Gualtieri CT, Ondrusek MG, Finley C (1985) Attention deficit disorders in adults. Clin Neuropharmacol 8(4):343–356

Hesslinger B, Tebartz van Elst L, Nyberg E, Dykierek P, Richter H, Berner M, Ebert D (2002) Psychotherapy of attention deficit hyperactivity disorder in adults–a pilot study using a structured skills training program. Eur Arch Psychiatry Clin Neurosci 252(4):177–184

Hesslinger B, Philipsen A, Richter H (2004) Psychotherapie der ADHS in Erwachsenalter: Ein Arbeitsbuch. Göttingen; Germany: Hogrefe Verlag GmbH & Co. KG

Hesslinger B, Philipsen A, Richter H (2010) Psychotherapie dwe ADHS im. Waaler, M. Larsson, & J. Alfredsson (eds.). Stockholm: Hogrefe Psykologiförlaget

Higgins ST, Silverman K, Heil SH (2008) Contingency management in the treatment of substance use disorders: a science-based treatment innovation. Guilford Press, New York

Hirvikoski T, Lindholm T, Nordenstrom A, Nordstrom AL, Lajic S (2009) High self-perceived stress and many stressors, but normal diurnal cortisol rhythm, in adults with ADHD (attention-deficit/hyperactivity disorder). Horm Behav 55(3):418–424

Hirvikoski T, Waaler E, Alfredsson J, Pihlgren C, Holmstrom A, Johnson A, Nordstrom AL (2011) Reduced ADHD symptoms in adults with ADHD after structured skills training group: results from a randomized controlled trial. Behav Res Ther 49(3):175–185

Hirvikoski T, Waaler E, Lindstrom T, Bolte S, Jokinen J (2015) Cognitive behavior therapy-based psychoeducational groups for adults with ADHD and their significant others (PEGASUS): an open clinical feasibility trial. Atten Deficit Hyperact Disord 7(1):89–99

Kessler RC, Adler L, Ames M, Demler O, Faraone S, Hiripi E, Walters EE (2005) The World Health Organization Adult ADHD Self-Report Scale (ASRS): a short screening scale for use in the general population. Psychol Med 35(2):245–256

Klassen LJ, Katzman MA, Chokka P (2010) Adult ADHD and its comorbidities, with a focus on bipolar disorder. J Affect Disord 124(1–2):1–8

Klassen LJ, Bilkey TS, Katzman MA, Chokka P (2012) Comorbid attention deficit/hyperactivity disorder and substance use disorder: treatment considerations. Curr Drug Abuse Rev 5(3):190–198

Klein RG, Abikoff H, Klass E, Ganeles D, Seese LM, Pollack S (1997) Clinical efficacy of methylphenidate in conduct disorder with and without attention deficit hyperactivity disorder. Arch Gen Psychiatry 54(12):1073–1080

Knouse LE, Cooper-Vince C, Sprich S, Safren SA (2008) Recent developments in the psychosocial treatment of adult ADHD. Expert Rev Neurother 8(10):1537–1548

Koesters M, Becker T, Kilian R, Fegert JM, Weinmann S (2009) Limits of meta-analysis: methylphenidate in the treatment of adult attention-deficit hyperactivity disorder. J Psychopharmacol 23(7):733–744

Kollins SH (2008) ADHD, substance use disorders, and psychostimulant treatment: current literature and treatment guidelines. J Atten Disord 12(2):115–125

Kooij J, Franken M (2010) DIVA 2.0 Dignostisch Interview Voor ADHD bij volwassenen (Diagnostic Interview for ADHD in Adults). Den Haag: Diva Foundation

Kooij SJ, Bejerot S, Blackwell A, Caci H, Casas-Brugue M, Carpentier PJ, Asherson P (2010) European consensus statement on diagnosis and treatment of adult ADHD: the European network adult ADHD. BMC Psychiatry 10:67

Larsson H, Chang Z, D'Onofrio B, Lichtenstein P (2014) The heritability of clinically diagnosed attention deficit hyperactivity disorder across the lifespan. Psychol Med 44(10):2223–2229

Mariani JJ, Levin FR (2007) Treatment strategies for co-occurring ADHD and substance use disorders. Am J Addict 16(Suppl 1):45–54 **(quiz 55–46)**

Masi G, Toni C, Perugi G, Travierso MC, Millepiedi S, Mucci M, Akiskal HS (2003) Externalizing disorders in consecutively referred children and adolescents with bipolar disorder. Compr Psychiatry 44(3):184–189

Mattes JA, Boswell L, Oliver H (1984) Methylphenidate effects on symptoms of attention deficit disorder in adults. Arch Gen Psychiatry 41(11):1059–1063

Matthys F, Joostens P, Tremmery S, Stes S, Sabbe B (2013) ADHD and addiction; application of the Belgian guideline with particular reference to comorbid affective disorders. Tijdschr Psychiatr 55(9):715–719

Meszaros A, Czobor P, Balint S, Komlosi S, Simon V, Bitter I (2009) Pharmacotherapy of adult attention deficit hyperactivity disorder (ADHD): a meta-analysis. Int J Neuropsychopharmacol 12(8):1137–1147

Mitchell JT, Zylowska L, Kollins SH (2014) Mindfulness meditation training for attention-deficit/hyperactivity disorder in adulthood: current empirical support, treatment overview, and future directions. Cognit Behav Pract 22:172–191

Morgensterns E, Alfredsson J, Hirvikoski T (2015) Structured skills training for adults with ADHD in an outpatient psychiatric context—an open feasibility trial. ADHD Atten Deficit Hyperact Disord 26 [Epub ahead of print]

National Board of Health (2014) Pharmacological treatment of adhd in children and adults. Retrieved from Stockholm

National Board of Institutional Care (2014) Årsrapport [Annual Report]. Retrieved from Stockholm: Statens Institutionsstyrelse: https://www.stat-inst.se

Philipsen A (2012) Psychotherapy in adult attention deficit hyperactivity disorder: implications for treatment and research. Expert Rev Neurother 12(10):1217–1225

Philipsen A, Richter H, Peters J, Alm B, Sobanski E, Colla M, Hesslinger B (2007) Structured group psychotherapy in adults with attention deficit hyperactivity disorder: results of an open multicentre study. J Nerv Ment Dis 195(12):1013–1019

Philipsen A, Graf E, Tebartz van Elst L, Jans T, Warnke A, Hesslinger B, Berger M (2010) Evaluation of the efficacy and effectiveness of a structured disorder tailored psychotherapy in ADHD in adults: study protocol of a

randomized controlled multicentre trial. Atten Deficit Hyperact Disord 2(4):203–212
Philipsen A, Graf E, Jans T, Matthies S, Borel P, Colla M, Berger M (2014) A randomized controlled multicenter trial on the multimodal treatment of adult attention-deficit hyperactivity disorder: enrollment and characteristics of the study sample. Atten Deficit Hyperact Disord 6(1):35–47
Proposition 1987/88:147. Om tvångsvård för vuxna missbrukare [Compulsory Care for substance abusers]
Rosler M, Retz W, Retz-Junginger P, Hengesch G, Schneider M, Supprian T, Thome J (2004) Prevalence of attention deficit-/hyperactivity disorder (ADHD) and comorbid disorders in young male prison inmates. Eur Arch Psychiatry Clin Neurosci 254(6):365–371
Safren SA, Otto MW, Sprich S, Winett CL, Wilens TE, Biederman J (2005) Cognitive-behavioral therapy for ADHD in medication-treated adults with continued symptoms. Behav Res Ther 43(7):831–842
Safren SA, Sprich S, Mimiaga MJ, Surman C, Knouse L, Groves M, Otto MW (2010) Cognitive behavioral therapy versus relaxation with educational support for medication-treated adults with ADHD and persistent symptoms: a randomized controlled trial. JAMA 304(8):875–880
Sepulveda DR, Thomas LM, McCabe SE, Cranford JA, Boyd CJ, Teter CJ (2011) Misuse of prescribed stimulant medication for ADHD and associated patterns of substance use: preliminary analysis among college students. J Pharm Pract 24(6):551–560
Sobanski E, Bruggemann D, Alm B, Kern S, Deschner M, Schubert T, Rietschel M (2007) Psychiatric comorbidity and functional impairment in a clinically referred sample of adults with attention-deficit/hyperactivity disorder (ADHD). Eur Arch Psychiatry Clin Neurosci 257(7):371–377
Solanto MV, Marks DJ, Mitchell KJ, Wasserstein J, Kofman MD (2008) Development of a new psychosocial treatment for adult ADHD. J Atten Disord 11(6):728–736
Solanto MV, Marks DJ, Wasserstein J, Mitchell K, Abikoff H, Alvir JMJ, Kofman MD (2010) Efficacy of meta-cognitive therapy for adult ADHD. Am J Psychiatry 167(8):958–968
Spencer TJ, Biederman J, Mick E (2007) Attention-deficit/hyperactivity disorder: diagnosis, lifespan, comorbidities, and neurobiology. Ambul Pediatr 7(1 Suppl):73–81
Stevenson CS, Whitmont S, Bornholt L, Livesey D, Stevenson RJ (2002) A cognitive remediation program for adults with Attention Deficit Hyperactivity Disorder. Aust New Wealand J Psychiatry 36(610):610–616
Stevenson CS, Stevenson RJ, Whitmont S (2003) A self-directed psychosocial intervention with minimal therapist contact for adults with attention deficit hyperactivity disorder. Clin Psychol Psychother 10(2):93–101
Strupp HH (1986) The nonspecific hypothesis of therapeutic effectiveness: a current assumption. Am J Orthopsychiatry 56(4):513–520
Sullivan MA, Rudnik-Levin F (2001) Attention deficit/hyperactivity disorder and substance abuse. Diagnostic and therapeutic considerations. Ann N Y Acad Sci 931:251–270
Torgersen T, Gjervan B, Rasmussen K (2006) ADHD in adults: a study of clinical characteristics, impairment and comorbidity. Nord J Psychiatry 60(1):38–43
Torok M, Darke S, Kaye S (2012) Attention deficit hyperactivity disorder and severity of substance use: the role of comorbid psychopathology. Psychol Addict Behav 26:974
van Emmerik-van Oortmerssen K, van de Glind G, van den Brink W, Smit F, Crunelle CL, Swets M, Schoevers RA (2012) Prevalence of attention-deficit hyperactivity disorder in substance use disorder patients: a meta-analysis and meta-regression analysis. Drug Alcohol Depend 122(1–2):11–19
van Emmerik-van Oortmerssen K, van de Glind G, Koeter MW, Allsop S, Auriacombe M, Barta C, Schoevers RA (2014) Psychiatric comorbidity in treatment-seeking substance use disorder patients with and without attention deficit hyperactivity disorder: results of the IASP study. Addiction 109(2):262–272
Vidal R, Bosch R, Nogueira M, Gomez-Barros N, Valero S, Palomar G, Ramos-Quiroga JA (2013) Psychoeducation for adults with attention deficit hyperactivity disorder versus cognitive behavioral group therapy: a randomized controlled pilot study. J Nerv Ment Dis 201(10):894–900
Ward MF, Wender PH, Reimherr FW (1993) The Wender Utah Rating Scale: an aid in the retrospective diagnosis of childhood attention deficit hyperactivity disorder. Am J Psychiatry 150(6):885–890
Weiss M, Murray C, Wasdell M, Greenfield B, Giles L, Hechtman L (2012) A randomized controlled trial of CBT therapy for adults with ADHD with and without medication. BMC Psychiatry 12:30
Wilens TE (2011) A sobering fact: ADHD leads to substance abuse. J Am Acad Child Adolesc Psychiatry 50(1):6–8
Wilens TE, Spencer TJ, Biederman J (2002) A review of the pharmacotherapy of adults with attention-deficit/hyperactivity disorder. J Atten Disord 5(4):189–202
Wilens TE, Monuteaux MC, Snyder LE, Moore H, Whitley J, Gignac M (2005) The clinical dilemma of using medications in substance-abusing adolescents and adults with attention-deficit/hyperactivity disorder: what does the literature tell us? J Child Adolesc Psychopharmacol 15(5):787–798
Wilens TE, Adler LA, Adams J, Sgambati S, Rotrosen J, Sawtelle R, Fusillo S (2008) Misuse and diversion of stimulants prescribed for ADHD: a systematic review of the literature. J Am Acad Child Adolesc Psychiatry 47(1):21–31
Wilens TE, Biederman J, Faraone SV, Martelon M, Westerberg D, Spencer TJ (2009) Presenting ADHD symptoms, subtypes, and comorbid disorders in clinically referred adults with ADHD. J Clin Psychiatry 70(11):1557–1562
Young S, Gudjonsson GH (2008) Growing out of ADHD: the relationship between functioning and symptoms. J Atten Disord 12(2):162–169
Zetterqvist J, Asherson P, Halldner L, Langstrom N, Larsson H (2013) Stimulant and non-stimulant attention deficit/hyperactivity disorder drug use: total population study of trends and discontinuation patterns 2006–2009. Acta Psychiatr Scand 128(1):70–77
Zylowska L, Ackerman DL, Yang MH, Futrell JL, Horton NL, Hale TS, Smalley SL (2008) Mindfulness meditation training in adults and adolescents with ADHD: a feasibility study. J Atten Disord 11(6):737–746