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Recent developments in the psychosocial treatment of adult ADHD

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Abstract

Adult attention-deficit/hyperactivity disorder (ADHD) is an increasingly recognized Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV psychiatric disorder associated with significant functional impairment in multiple domains. Although stimulant and other pharmacotherapy regimens have the most empirical support as treatments for ADHD in adults, many adults with the disorder continue to experience significant residual symptoms. In the present manuscript, we review the published studies examining group and individual psychosocial treatments for adult ADHD. We include a discussion of coaching interventions and how they differ from cognitive-behavioral therapy. We conclude that the available data support the use of structured, skills-based psychosocial interventions as a viable treatment for adults with residual symptoms of ADHD. Common elements across the various treatment packages include psychoeducation, training in concrete skills (e.g., organization and planning strategies) and emphasis on outside practice and maintenance of these strategies in daily life. These treatments, however, require further study for replication, extension and refinement. Finally, we suggest future directions for the application of psychosocial treatments to the problems of adults with ADHD.

Keywords

adults; attention-deficit/hyperactivity disorder; cognitive-behavioral therapy; psychosocial treatment; psychotherapy

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A growing body of literature demonstrates that attention-deficit/hyperactivity disorder (ADHD) is a valid disorder that continues to affect a substantial proportion of patients into adulthood, and that it is associated with significant and costly functional impairment in multiple domains [1,2]. Although medication treatment can address core neurobiological symptoms of the disorder, many adults continue to have residual symptoms (TABLE 1). For example, adults

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who are considered medication responders typically show a reduction in 50% or less of core symptoms of ADHD [3,4]. Medication treatment also may not fully address the multiple domains of impairment experienced by adults with this disorder. Recommendations in the clinical literature, therefore, have often included psychosocial interventions in combination with medications [3,5–7]. Prior to the last 10 years, however, there was no empirical evidence supporting these recommendations and treatment guidelines were based almost entirely on clinical experience [8–11]. Even more recently, the rate of new investigations in this area appears to have increased, although the volume of literature continues to lag far behind that of other adult disorders and that of ADHD treatment in children.

The goal of this review is to highlight the most recent findings in the area of psychosocial treatments for adults with ADHD and to highlight future directions. The first section of the article reviews the extant empirical research on this topic. We begin with a very brief overview of earlier studies and focus more specifically, in turn, on group and individual interventions that have been tested within the past 5 years. We then discuss coaching and how it can be differentiated from – or, perhaps, integrated with – cognitive-behavioral therapy (CBT). Finally, we provide commentary on these recent developments and future research directions for the field.

Review of prior research on psychosocial treatment for adult ADHD

Earlier studies

The current review focuses on very recent developments in psychosocial treatments for adult ADHD. Studies published in 2003 or earlier are summarized in TABLE 2. Notably, the treatments investigated in these studies all involve some form of psychoeducation with skills training. The first examination of individual treatment involved adapting cognitive therapy to help adults with ADHD reduced avoidance and improved motivation [12]. This study focused on patients who were also receiving medication treatment for ADHD. Wiggins and colleagues conducted the first published group psychosocial intervention for adults with ADHD, providing a four-session psychoeducation and skills-based program associated with self-reported reductions in symptoms [13]. Later, Hesslinger *et al.* tested a group-based modification of dialectical behavior therapy (DBT), which was associated with positive treatment outcomes [14]. More recently, this group has published a multisite trial of their modified DBT, which is described in detail below. The Cognitive Remediation Program developed by Stevenson *et al.* [15,16] is also described in TABLE 2. This group treatment has unique features including the use of a standardized treatment workbook and the use of an ‘individual support person’. Details about the role of this support person are further discussed in the section on ADHD coaching. Stevenson *et al.* also notably tested a self-guided version of their treatment and found evidence to support the efficacy of this potentially cost-effective intervention [16].

The following two sections summarize data on the most recent group and individual psychosocial approaches to adult ADHD. These studies are also displayed in TABLE 3.

Group treatments

Several of the recently developed and tested treatments for adults with ADHD are designed for a group setting. Not only is this method of intervention delivery potentially cost effective, but also group members may provide support for one another and model positive behavior change.

Dialectical behavioral therapy

German investigators [17] recently published a report on their adaptation of DBT [18] for adults with ADHD [19]. As shown in TABLE 2, they previously published a small waitlist control

trial of this group-based treatment and found that the treatment group showed significant reductions on measures of ADHD symptoms, depression and other measures of psychopathology and impairment following the intervention [14]. The recent study was a multisite open trial of this group skills training program with the goal of evaluating the effects, feasibility and acceptability of the treatment across sites.

Dialectical behavior therapy is a cognitive-behavioral treatment developed for patients with borderline personality disorder. It combines change-oriented skills from CBT with acceptance-oriented skills and core mindfulness skills. While ADHD and borderline personality disorder are distinct from one another, both have been associated with emotional dysregulation, impulsivity, low self-esteem and difficulties in interpersonal relationships, leading the authors to consider DBT skills as part of an intervention package for adults with ADHD. Their treatment includes several modules specifically tailored to the needs of adults with ADHD.

Treatment consisted of 13 weekly 2-h groups led by two therapists with training in both CBT and DBT. Modules included psychoeducation, neurobiology of ADHD and mindfulness training, 'Chaos and Control' (organizational strategies), dysfunctional behavior/behavioral analysis, emotion regulation, depression, impulse control, stress management, substance use and relationships/self-respect. Each session involved review and assignment of at-home exercises as well as presentation of the new material for that session.

In total, 72 patients (29 females and 43 males) aged 18–53 years who were diagnosed with Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV and International Classification of Diseases (ICD)-10 ADHD criteria participated [17]. Of the 72 patients, 66 (92%) completed the program. Medication status (48 patients were medicated) did not moderate outcomes. Measurement from pre- to post-treatment showed significant reductions with small effect sizes on the three self-report symptom rating scales collected: ADHD Checklist, Beck Depression Inventory (BDI) and Symptom Checklist-90 (SCL-90) items that have been shown to be related to ADHD (subset of 16 items). Self-reported health status improved significantly. When baseline depression scores were added to the model, these were a significant predictor of change in BDI and SCL-90 scores, but not ADHD symptoms or health status.

The majority of patients rated various aspects of treatment as helpful, including psychoeducation (88%), the group setting (75%) and the therapists (75%), followed by the homework assignments (72%). The three most highly rated treatment modules were (in order) behavioral analysis, mindfulness and emotion regulation. Owing to the low dropout rate and these positive ratings, the authors suggest that their treatment was highly acceptable to patients. The authors are planning a large, multisite placebo-controlled study of this treatment that will compare medication only to group treatment only and their combination.

Group metacognitive therapy

Solanto *et al.* recently reported on the development of a manualized group treatment for adults with ADHD designed to specifically target problems in time management and organization and planning, which they named metacognitive therapy [20]. They describe their treatment as a cognitive-behavioral intervention that is intended to 'enhance the development of an overarching set of executive self-management skills' [20]. As such, they drew upon neuropsychological theories of ADHD to develop their group-formatted intervention and emphasized repeated practice of skills with the goal of making them automatic. During each weekly 2-h session, groups of five-to-eight participants first discussed at-home application of skills, received feedback from group members and were given new skill information from group leaders.

A total of thirty adults who were diagnosed with ADHD by a mental health professional participated in either an eight- or 12-session version of metacognitive therapy. Of the participants, 70% were receiving ongoing medication treatment for their ADHD symptoms. At post-treatment assessment, participants demonstrated significant reductions in inattentive symptoms, as measured by the Conners' Adult ADHD Rating Scale (CAARS) and the Brown ADD Scales (BADDs). Approximately 47% of the sample fell below the clinical cutoff for inattentive symptoms on the CAARS at post-treatment. A self-report measure of time management, organization and planning skills showed significant improvements post-treatment. The authors conclude that this treatment shows promise in addressing metacognitive deficits in adults with ADHD and are continuing to investigate its efficacy in an ongoing randomized controlled trial.

Cognitive-behaviorally oriented group rehabilitation

Virta and colleagues developed and tested a group-based neuro-psychologically informed CBT program with a sample of 29 adults with ADHD in Finland [21]. Treatment modules were designed to target DSM-IV symptoms and symptoms identified as problematic by Brown [22]. Participants were 15 men and 14 women, of which 66% were receiving medication treatment for adult ADHD. They participated in ten or 11 weekly 90–120-min group sessions designed to enhance their knowledge of ADHD, enhance their skills in dealing with the symptoms of the disorder and provide peer support. Sessions covered neurobiology and medication, motivation and initiation of activities, organization, attention, emotion regulation, memory, information for significant others/communication, impulsivity, comorbidity and self-esteem. Session structure consisted of review of previous homework and group theme, introducing of new theme, new homework and finally a self-reflective inquiry regarding that day's session.

The overall mean number of sessions attended was 86%. On the self-report Brown ADD Rating Scale, subscales of activation, affect and total score decreased significantly, as did SCL-90 items related to ADHD. Using the BADDs, 31% of participants showed improvement immediately following treatment. A total of 97% of participants self-reported at least moderate benefit, although there were changes in ratings of each participant's symptoms made by others. This treatment represents another application of structured, skills-based treatment in adults with ADHD.

Group mindfulness meditation training

Zylowska and colleagues recently tested a novel application of mindfulness-based meditation practice to address the symptoms of adults and adolescents with ADHD [23]. Reasoning that practice of the control of attention required during mindfulness exercises would improve attentional control, distractibility awareness and emotion regulation for these patients, the authors conducted an uncontrolled feasibility study of 24 adults and eight adolescents, examining the effects of an 8-week group-formatted training program. Their Mindfulness Awareness Practices (MAPs) for ADHD involved eight weekly 2.5-h sessions and daily at-home mindfulness practice. Sessions relied heavily on experiential practice of mindfulness skills and also included psychoeducation regarding ADHD, shorter assigned practice periods than in traditional MAPs, emphasis on mindfulness in daily living, visual teaching aids to illustrate concepts and use of self-affirming meditations to address self-esteem issues.

In the study, 75% of adults and 87% of adolescents completed the treatment and the post-treatment assessment for an overall adherence rate of 78% with no specific predictors of dropout identified. The average number of sessions attended was seven. Self-reported at-home practice was 90.3 min and 4.9 days per week for the adults and 42.6 min and 4.02 days for adolescents. Both age groups gave the treatment a very high satisfaction rating. Completers

reported a significant decrease in inattentive and hyperactive–impulsive symptoms from pre- to post-treatment via self-report rating scale. A total of 30% of participants showed reductions in symptom scores of 30% or more, which the authors considered clinically significant. Interestingly, subjects also improved in their performance on attention conflict tasks (Attention Network Task, Conflict and Stroop Interference), which require participants to attend and respond to competing aspects of a stimulus. They also improved on measures of set-shifting (trials A and B). However, future investigations will be needed to rule out regression to the mean or practice effects on these tasks. Depression and anxiety symptom scores improved for adults with ADHD, but not for adolescents. The authors of this study conceptualize their treatment as ‘self-regulation training’ and describe how it could be incorporated into a multimodal intervention for adults with ADHD.

This section reviewed recent open trials of four different group treatment approaches for adults with ADHD. The studies demonstrate the feasibility and acceptability of these approaches and begin to provide evidence for treatment efficacy. Although each approach is distinct, they all include a structured format, psychoeducational components and weekly assignments for practice of concrete skills outside of the group. Two of the treatments draw upon neuropsychological models of ADHD and focus on the development of compensatory skills [20,21]. The other two approaches (DBT and mindfulness meditation) draw upon mindfulness concepts and suggest that adults with ADHD may benefit from strategies that help them to actively control attention. Finally, the DBT approach by Hesslinger *et al.* blends mindfulness/acceptance concepts with more traditional skills-based training [19]. All of these treatments were associated with some self-reported reduction in ADHD symptoms from pre- to post-treatment.

Summary of recent group intervention research

Ongoing research on group approaches is needed, including studies that address threats to internal validity. The limitations of drawing conclusions about these treatments for individuals with ADHD include generally small sample sizes, possible atypicality of samples, inability to tease apart effects of group support and psychoeducation from specific effects of content and lack of control groups. Importantly, these studies mostly report changes in self-report of symptoms (although Zylowska *et al.* found effects on neuropsychological tests [23]). More objective ratings (e.g., by raters blinded to treatment status) will need to be incorporated to rule out demand characteristics and placebo effects. For example, Virta *et al.* found effects on self-report measures but not other-report measures [21]. Therefore, additional controlled studies with other- and clinician-reported symptoms will be necessary. Overall, these studies provide preliminary evidence for and highlight the possibilities of the treatment of adults with ADHD in a group format.

Individual treatments

Evaluations of two different individual applications of CBT to adult ADHD have recently been published. Possible advantages of individual treatment include the ability to tailor treatment to the individual patient’s needs and the formation of a strong therapist–client alliance to work together toward change.

Combined medication & CBT

In an open study of 43 adults who had been diagnosed with ADHD, Rostain and Ramsay recently examined the effects of 6 months of combined medication and CBT [24]. CBT focused on teaching individualized coping strategies, and identifying and modifying maladaptive patterns of thinking that could interfere with effective coping. Specifically, sessions included psychoeducation about ADHD, helping the client to conceptualize their difficulties from a CBT

perspective, training coping strategies, working on treatment-interfering behavior both behaviorally and cognitively and building on strengths. Participants received 16 50-min individual CBT sessions over the course of 6 months. Medication treatment consisted of Adderall® titrated to the participant's optimal dose, up to 20 mg twice daily.

Participants completed a diagnostic evaluation and were included in the study if they met DSM-IV criteria for ADHD based on the agreement of two expert clinicians, obtained a sufficiently high score on the Brown ADD scales and showed evidence of symptom onset in childhood. At post-treatment, adults receiving combined medication treatment and CBT showed significant reductions in clinician-rated ADHD symptoms with a large effect size. Clinician-rated clinical global impression scores for ADHD symptoms were reduced from pre- to post-treatment with a very large effect size. Significant reductions in comorbid anxiety and depression symptoms were also observed for both self-report and clinician ratings of symptoms. Owing to the use of a combined treatment approach, it is unclear the extent to which improvements were differentially associated with medication versus CBT. However, the results demonstrate the potential efficacy of a combined treatment package for this population.

CBT for medication-treated adults with ADHD & residual symptoms

Our clinical research group completed a randomized controlled trial of CBT for adult ADHD at Massachusetts General Hospital, in Boston (MA, USA) [25]. Notably, this research program has focused on the treatment of adults who are stabilized on medication but continue to experience significant residual symptoms. Consistent with other current theories of ADHD [26,27], the treatment model begins with neurobiological core symptoms that contribute to distractibility, disorganization, difficulty following through on tasks and impulsivity. These problems cause difficulties and impede acquisition and use of effective compensatory strategies, resulting in symptom maintenance and exacerbation. Multiple failure experiences and underachievement can lead to the development of maladaptive cognitions and beliefs that reinforce this cycle, increasing avoidance and decreasing the likelihood that an adult with ADHD will use strategies that could lead to functional improvement. Thus, our treatment focuses on both training compensatory strategies and addressing dysfunctional cognitions and negative emotions that contribute to avoidance, procrastination and attentional shifts.

The CBT treatment in this trial was organized into six modules: three core modules (organizing and planning, reducing distractibility and cognitive restructuring) and three optional modules (procrastination, anger and frustration management, and communication skills). As with most CBTs, this treatment was quite structured. Each session began with the therapist and patient setting an agenda. Symptom severity from the previous week was reviewed via rating scale, and medication adherence was reviewed and discussed. Prior skills-oriented homework was reviewed with a troubleshooting orientation. New skill material was presented and related homework was assigned. Specific material included psychoeducation regarding ADHD, use of a calendar and task list, prioritizing and problem-solving, modifying the environment to reduce distractibility, cues to maintain attention and increasing awareness of and adaptive response to negative automatic thoughts.

In the randomized controlled trial ($n = 31$), eligible participants were adults between the ages of 18 and 65 years who were stable on their medications for ADHD and had a principal diagnosis of ADHD including childhood onset and moderate severity using the Clinical Global Impression (CGI) Severity Scale Score [28] of 4 or above. The trial demonstrated that CBT was superior to continued medication treatment alone. At the outcome assessment, participants randomized to CBT ($n = 16$) had lower ADHD symptoms and global severity, as rated by an independent assessor blinded to treatment group, as well as lower self-reported ADHD symptoms than those randomized to continued psychopharmacology alone ($n = 15$). The number of treatment responders in each condition was examined, using a conservative outcome

of a CGI score reduction in 2 points or more. Significantly more patients who received CBT were treatment responders (56%) compared with those who did not (13%). Post-treatment, the CBT group also had lower anxiety by independent assessor and self-report ratings, and lower independent assessor-rated depression. Treatment-related reductions in core ADHD symptoms persisted when statistically controlling for baseline levels of depression.

We have modified the treatment protocol subsequent to this study based on our experience and patients' feedback. We chose to eliminate the optional modules on communication skills and anger management because the core modules alone involve a great deal of behavioral change, and adding additional material seemed overwhelming for patients. We did, however, retain the procrastination module as many participants found this relevant and helpful. Finally, we added a session that includes a patient's spouse or significant other to provide psychoeducation on ADHD and rally support for the patient's behavioral changes. The participant workbook and therapist guide of this modified treatment are published [29,30] and our group is currently conducting a larger-scale, randomized controlled trial of the treatment for adults receiving medication treatment for ADHD. In this efficacy study, we are comparing CBT with a treatment control condition, relaxation training. This study will subject our intervention to the most rigorous test of efficacy as yet in the literature and provide data on treatment moderators.

Summary regarding recent individual interventions

These two recent studies demonstrate the potential efficacy of an individual, structured, cognitive-behavioral approach to treatment of adult ADHD. Notably, both of these studies focus on the combination of medication to reduce the impact of core symptoms with CBT to enhance behavioral and cognitive coping strategies. These studies also show effects on both clinician ratings and self-report of symptoms. Next, we turn to a discussion of another type of individual intervention, coaching for adult ADHD. Owing to its prominence in the clinical and popular literature, and its practical focus, it is important to address this treatment approach and to compare and contrast it with cognitive-behavioral treatments.

Coaching interventions for adult ADHD

Coaching (peer coaching and life coaching) is an increasingly popular intervention for adults with ADHD, despite little empirical study of its efficacy for this population. It is a highly individualized intervention that focuses on goal-setting, strategy selection and accountability as the coach guides the client in accomplishing his or her tasks and goals [31]. Advocates of coaching distinguish between it and 'traditional' therapy, describing coaching as more action- and less insight-oriented [32]. However, coaching may have more in common with CBT than it does with more insight-oriented therapies (e.g., psychodynamic therapy) and some have questioned the extent to which coaching differs from CBT [33]. Distinct differences, however, can be identified.

First, while CBT and coaching could both be described as action-oriented, the goal of CBT is to train clients in domain-general coping skills that can be applied in a variety of contexts. Application to particular problems is addressed in-session and through homework, but the client is encouraged to learn to apply skills in novel situations. Coaching, however, appears to be primarily focused on helping the client handle specific problems or reach specific, concrete goals. Second, CBT focuses on the mediational role of thoughts and beliefs in the implementation and maintenance of skills. Coaching, however, has been described as specifically not focusing on the 'why' of a particular behavior or lack thereof [34]. Third, the format of CBT and coaching differs significantly. Coaching sessions may take place in person, via telephone or via email and are generally more flexible, brief and frequent. Likewise, the coach is generally more accessible to the client on an as-needed basis, while the CBT therapist encourages the client to practice skills on his or her own through weekly homework

assignments. Finally, the role of the relationship between professional and client differs significantly. In CBT, the therapeutic relationship (or, in some cases, the group) is a collaborative context in which the patient is guided in making cognitive and behavioral changes and is encouraged to take ownership of those changes. In coaching, it could be argued that the relationship is the intervention and it is unclear whether behavioral changes should be expected to persist after the coaching relationship ends. Thus, while a coach and a CBT therapist may sometimes use similar interventions (e.g., organizational strategies) their relationship with and goals for the client differ significantly. These differences highlight the need for further empirical study of the efficacy of coaching interventions for adults with ADHD (for further arguments for scientific study of coaching see elsewhere [33]).

The few published studies on coaching for adults with ADHD examine this intervention as applied to the academic problems of students in a college setting. Zwart and Kallemeyn reported that a peer coaching intervention for a group of students with ADHD and learning disabilities resulted in improved motivation, time management, test preparation and self-efficacy with decreases in anxiety [35]. However, this study did not report which strategies were more helpful for those whose primary difficulties were a result of ADHD. Pertaining specifically to students with ADHD, Swartz and Proctor reported case study evidence in favor of a highly individualized coaching intervention involving setting of long-term goals and weekly objectives, and the use of rewards and consequences within flexible, personalized client-coach interactions [36]. They argue that the personalized nature of coaching makes empirical evaluation of its efficacy difficult. However, further study is critical to validate the efficacy of coaching interventions and to evaluate their role in the treatment of adults with ADHD.

Preliminary evidence supports the role of coaching in a multimodal treatment package for adults with ADHD. Stevenson *et al.* used a coach-like individual to augment group-based skills training (TABLE 2) [15,16]. These ‘individual support persons’ were trained to serve a ‘cuing or prompting role’ for adults enrolled in the treatment. Specifically, they reminded patients about attending sessions, attended sessions and took notes as needed, and discussed problems with homework assignments with the patients. Each coach was to make at least one telephone contact with the patient between treatment sessions. In a second study, support people were used in conjunction with self-guided workbook-driven treatment with minimal therapist contact. Both studies showed positive effects compared with a waitlist control group and evidence of some maintenance of treatment gains. These studies suggest that a structured psychosocial treatment approach might be augmented by an individual coach who is fully integrated with the treatment, perhaps capitalizing on the strengths of both approaches.

Expert commentary & five-year view

Psychosocial treatments for ADHD in adulthood are receiving increasing empirical support. Of existing successful treatments, common elements include training in concrete skills and a strong emphasis on skills practice outside of the treatment sessions. Some approaches also include cognitive therapy techniques (i.e., cognitive restructuring) to address maladaptive thinking patterns that may have developed in response to past failures and may continue to impede the effective implementation of strategies in the present. As other authors have noted, the structured nature of CBT may provide a particularly good framework for helping adults with ADHD address their functional difficulties [37]. Other group-based treatments are predicated on a model of neuropsychological rehabilitation and, more recently, mindfulness-based approaches have been tested as a treatment approach to improve control of attention. Generally, available psychosocial treatments seem to more fully address inattentive symptoms versus hyperactive-impulsive symptoms. Existing studies are generally uncontrolled or are small, randomized controlled trials. Although clinicians who treat ADHD in adulthood

continually call for psychosocial treatments as an adjunct to medications, the evidence base for doing this is only just emerging.

Compared with psychosocial treatments for other adult disorders, the development and validation of such interventions for adults with ADHD is still in its earliest stages. According to the American Psychological Association [¹⁰¹], for a psychosocial treatment to be considered empirically supported, in addition to having the treatment accessible in a treatment manual, it must show positive treatment outcomes across more than one trial and be demonstrated by more than one investigator team. Currently, the existing trials are small, with the developer of the treatment being the principal investigator. Future trials are needed by additional research groups willing to test such treatments. While significant work remains to be carried out and significant challenges lie ahead, this is also an exciting time for research-oriented clinicians focused on enhancing outcomes for this population. The growing body of basic research on ADHD in adulthood, as well as an understanding of the history of the development of psychosocial treatments for other disorders, must inform future research in this area.

Future trials of CBT for this population must include follow-up data. With the exception of the studies on the cognitive remediation program [15,16], we currently have no data on the persistence of treatment gains following the end of active treatment. Although our CBT treatment package included a module on relapse prevention, the chronic nature of ADHD may necessitate more comprehensive strategies. As with psychosocial treatments for other disorders, maintenance of treatment gains may have to be enhanced with modifications such as booster sessions.

More focused investigations on the efficacy of one form of treatment versus multimodal approaches will be needed to determine the most effective and cost-effective combinations of treatment. Studies differ in their level of attention to the medication status of participants. Will psychosocial interventions meaningfully impact functional impairment in the absence of psychopharmacological reductions in core symptoms? While results from the Multimodal Treatment Study of Children with ADHD (MTA) would suggest that medication is likely to be a critical component in effective treatment of the disorder in adulthood [38], some adults are not willing or able to take medications. More data are needed on the efficacy of cognitive-behavioral treatment as a monotherapy for these adults. Additional data on coaching as a monotherapy and on its integration with more structured approaches are also needed.

Answering the question of, 'What works for whom?' is an ongoing and important challenge for clinicians and clinical researchers alike in the application of manualized treatments to individual clients. This question certainly applies to psychosocial treatments for adults with ADHD. What moderating variables are important in predicting treatment response? Might the characteristics of a particular client at the outset of treatment suggest a particular intervention package? Similar to the MTA, future studies may identify subgroups of adults with ADHD for whom psychosocial treatment alone may be particularly effective [39]. Researchers must carefully collect the data necessary to begin to answer these questions as part of randomized controlled trials. For example, Rostain and Ramsay suggest that, by clinical observation, 'stage of change' appeared to be important in predicting treatment success, supporting the incorporation of motivational interviewing strategies into treatment [24].

Future exploration of mediating and moderating variables will also be important if efficient progress in treatment development is to be made. Pathways in our model and in other cognitive-

¹⁰¹ Website

Chambless DC, Sanderson WC, Shoham V *et al.* An update on empirically validated therapies www.apa.org/divisions/div12/est/newrpt.pdf

behavioral models of ADHD in adults will need to be evaluated empirically. For example, while the role of faulty cognitions in other disorders has been firmly established (e.g., depression), future research must address the processes of therapeutic change unique to adults with ADHD.

Another important trend in the greater body of research on CBT has been component studies, or dismantling approaches designed to identify the ‘active ingredient’ in psychosocial interventions [40]. While this type of analysis is probably further than 5 years away, treatment developers including our own group are collecting data concerning which treatment components appear to be the most useful and efficacious. Moving forward, these data will be essential to further refine our ‘first wave’ of CBT manuals. Researchers could also consider using an additive approach to treatment development, piloting individual parts of an intervention before adding them to a treatment package.

Because both longitudinal and cross-sectional research on ADHD has identified impairment in multiple functional domains [1], it also seems highly likely that clinical researchers will want to address these domains as part of their treatment packages. Research has documented impairments in multiple roles associated with ADHD in adults, including marital functioning [41], parenting [42] and academic domains [43]. Thus, clinical researchers with particular interest and expertise in these domains may begin to develop specialized versions of standard interventions that take the deficits associated with ADHD into account. For example, specialized versions of behavioral parent training and couples therapy may be developed. In this same vein, the integration of various approaches into comprehensive, even family-based treatment packages will be an increasing trend. Already, Goossensen *et al.* have begun to test a multimodal treatment package targeting ADHD in patients receiving substance abuse treatment, including psychoeducation, stimulant treatment and a group-based skills and support intervention [44]. Perhaps most importantly, research on treatment effectiveness must begin to include adults with greater severity of illness that may not often be included in our clinical trials. As research suggests that people with ADHD who present to clinics in adulthood may represent a more functional minority of adults with this disorder, researchers may need to develop procedures to recruit and retain individuals with more severe impairing illness.

Key issues

- Although published guidelines for the treatment of attention-deficit/hyperactivity disorder (ADHD) call for the use of psychotherapy with medications, empirical investigations of psychotherapeutic approaches are still in the earlier stages.
- A growing body of empirical evidence supports structured, skills-based psychosocial treatment for ADHD in adults as a valuable adjunctive treatment to stimulant medications. Both individual and group-based treatments appear to be valuable.
- This conclusion is currently supported by data from six published uncontrolled studies and five published controlled studies employing a variety of treatment packages.
- Cognitive-behavioral approaches may be particularly useful for adults with ADHD because the structured nature of the sessions allow the patient and the therapist to follow a specific agenda relevant to the patients’ goals, and therefore stay on target with the goals of the treatment.
- Critical components of these intervention packages appear to be psychoeducation, training of concrete strategies (e.g., organization and planning) and emphasis on practice and maintenance of strategies in daily life.

- The scientific rigor of studies on psychosocial treatment for adult ADHD is likely to increase as the field develops. Our group is currently conducting a randomized, controlled trial of cognitive-behavioral therapy (CBT) for adults with ADHD treated with medication compared with an alternative psychotherapy. We are collecting a variety of measures to evaluate treatment efficacy and to explore mediators and moderators.
- CBT and coaching differ fundamentally in treatment philosophy. Further empirical investigation of coaching (either alone or as an adjunct to CBT) is needed.
- Future directions for this research area include:
 - Replication of currently completed smaller studies of CBT for adult ADHD with larger samples and by other investigator teams
 - Investigation of treatment effects at long-term follow-up and methods to enhance longevity of treatment gains
 - Specific studies of psychosocial treatment in unmedicated adults
 - Investigation of moderating variables that impact treatment effectiveness (e.g., comorbidity and readiness for change)
 - Exploration of mediating variables in treatment and the processes relevant to client behavior change
 - Refinement of treatment protocols by defining the most effective components of CBT for adult ADHD
 - Development of other modes of treatment (parent training, couples therapy and substance-abuse treatment) specifically targeting adults with ADHD
 - Development of comprehensive, combined treatment packages addressing multiple domains of functional impairment for families coping with ADHD
 - Recruitment, inclusion and retention of samples of adults with ADHD more representative of the population
- The community of researchers and clinicians interested in empirically supported, standardized psychosocial treatments for adult ADHD is growing. This will enhance the quality and dissemination of effective treatments.
- Although ADHD is primarily a neurobiological disorder, emerging evidence suggests that cognitive-behavioral skill-building approaches can have statistically and clinically significant effects for adults with this chronic and impairing disorder.

Finally, one of the most important developments in this research area over the next 5 years may be the formation of a community of researchers focused on the psychosocial treatment of adult ADHD. As information about and interest in this research area becomes more widespread and a cohesive body of literature develops, an interconnected community of researchers will also continue to strengthen. Both collaborative relationships and intellectual debates within this community will play a role in improving the quality of our work. This community must also continue to provide psychoeducation to clients, clinicians, researchers and the public about adult ADHD and the evidence supporting psychosocial interventions. In the next 5–10 years, this should lead to more adults with ADHD receiving more comprehensive and effective treatment than ever before.

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References

Papers of special note have been highlighted as:

• of interest

•• of considerable interest

1. Barkley RA, Murphy KR, Fischer M. *ADHD in Adults: What the Science Says*. 2008. NY, USA: Guilford Press. Comprehensive report of results from two large studies of adults with attention-deficit/hyperactivity disorder (ADHD).
2. Barkley RA, Cook EH, Dulcan M, et al. International consensus statement on ADHD. *Eur. Child Adolesc. Psychiatry* 2002;11:96–98. [PubMed: 12033751]
3. Wilens TE, Biederman J, Spencer TJ. Pharmacotherapy of attention deficit hyperactivity disorder in adults. *CNS Drugs* 1998;9:347–356.
4. Wilens TE, Spencer TJ, Biederman J, et al. A review of the pharmacotherapy of adults with attention-deficit/hyperactivity disorder. *J. Atten. Disord* 2001;5(4):189–202. [PubMed: 11967475]
5. Biederman J.; Wilens, T.; Spencer, T., et al. Diagnosis and treatment of adult attention-deficit/hyperactivity disorder. In: Pollack, M.; Otto, M.; Rosenbaum, J., editors. *Challenges in Clinical Practice*. NY, USA: The Guilford Press; 1996. p. 380–407.
6. Wender PH. Pharmacotherapy of attention-deficit/hyperactivity disorder in adults. *J. Clin. Psychol* 1998;59:76–79.
7. Prince, JB.; Wilens, TE.; Spencer, TJ.; Biederman, J. Pharmacotherapy of ADHD in adults. In: Barkley, R., editor. *Attention Deficit Hyperactivity Disorder (3rd Edition): A Handbook for Diagnosis and Treatment*. NY, USA: Guilford Press; 2006. p. 704–736.
8. McDermott, SP. Cognitive therapy of adults with attention-deficit/hyperactivity disorder. In: Brown, T., editor. *Attention Deficit Disorders and Comorbidity in Children, Adolescents, and Adults*. DC, USA: American Psychiatric Press; 2000.
9. Nadeau, KG. Life management skills for the adult with ADD. In: Nadeau, KG., editor. *A Comprehensive Guide to Attention Deficit Disorder in Adults: Research, Diagnosis, and Treatment*. NY, USA: Brunner/Mazel; 1995. p. 191–217.
10. Murphy, KR. Psychological counseling of adults with ADHD. In: Barkley, R., editor. *Attention Deficit Hyperactivity Disorder (3rd Edition): A Handbook for Diagnosis and Treatment*. NY, USA: Guilford Press; 2006. p. 692–703.
11. Hallowell, EM. Psychotherapy of adult attention deficit disorder. In: Nadeau, KG., editor. *A Comprehensive Guide to Attention Deficit Disorder in Adults: Research, Diagnosis, and Treatment*. New York, USA: Brunner/Mazel; 1995. p. 146–167.
12. Wilens TE, McDermott SP, Biederman J, Abrantes A, Haesly A, Spencer TJ. Cognitive therapy in the treatment of adults with ADHD: a systematic chart review of 26 cases. *J. Cognitive Psychother. Int. Quarterly* 1999;13:215–227.
13. Wiggins D, Singh K, Getz HG, Hutchins DE. Effects of brief group intervention for adults with attention deficit/hyperactivity disorder. *J. Ment. Health Couns* 1999;21(1):82–93.
14. Hesslinger B, Tebartz van Elst L, Nyberg E, et al. Psychotherapy of attention deficit hyperactivity disorder in adults: a pilot study using a structured skills training program. *Eur. Arch. Psychiatry Clin. Neurosci* 2002;252(4):177–184. [PubMed: 12242579]

15. Stevenson CS, Whitmont S, Bornholt L, Livesey D, Stevenson RJ. A cognitive remediation programme for adults with attention deficit hyperactivity disorder. *Aust. NZ J. Psychiatry* 2002;36:610–616. Report of skills-based group incorporating an individual support person/coach.
16. Stevenson CS, Stevenson RJ, Whitmont S. A self-directed psychosocial intervention with minimal therapist contact for adults with attention deficit hyperactivity disorder. *Clin. Psychol. Psychother* 2003;10:93–101.
17. Philipsen A, Richter H, Peters J, et al. Structured group psychotherapy in adults with attention deficit hyperactivity disorder: results of an open multicenter study. *J. Nerv. Ment. Dis* 2007;195(12):1013–1019. [PubMed: 18091195] Report on largest psychosocial treatment study for adults with ADHD to date.
18. Linehan, M. *Cognitive–Behavioral Treatment of Borderline Personality Disorder*. NY, USA: Guilford Press; 1993.
19. Hesslinger, B.; Philipsen, A.; Richter, H. *Psychotherapy in Adult ADHD: A Workbook*. Hogrefe, Germany: Göttingen; 2004.
20. Solanto MV, Marks DJ, Mitchell KJ, Wasserstein J, Kofman MD. Development of a new psychosocial treatment for adult ADHD. *J. Atten. Disord* 2008;11(6):728–736. [PubMed: 17712167] Report on metacognitive therapy for adult ADHD.
21. Virta M, Vedenpaa A, Gronroos N, et al. Adults with ADHD benefit from cognitive behaviorally oriented group rehabilitation: a study of 29 participants. *J. Atten. Disord.* 2008(Epub ahead of print).
22. Brown, TE. *Attention Deficit Disorder: The Unfocused Mind in Children and Adults*. New Haven, CT, USA: Yale University Press; 2005.
23. Zylowska L, Ackerman DL, Tang MH, et al. Mindfulness meditation training in adults and adolescents with ADHD: a feasibility study. *J. Atten. Disord* 2008;11(6):737–746. [PubMed: 18025249]
24. Rostain AL, Ramsay JR. A combined treatment approach for adults with ADHD: results of an open study of 43 patients. *J. Atten. Disord* 2006;10:150–159. [PubMed: 17085625]
25. Safren SA, Otto MW, Sprich S, Winett CL, Wilens TE, Biederman J. Cognitive-behavioral therapy for ADHD in medication-treated adults with continued symptoms. *Behav. Res. Ther* 2005;43:831–842. [PubMed: 15896281] Report on randomized controlled trial at Massachusetts General Hospital.
26. Barkley, R. *ADHD and the Nature of Self-Control*. NY, USA: Guilford Press; 1997.
27. Nigg, J. *What Causes ADHD? Understanding What Goes Wrong and Why*. NY, USA: Guilford Press; 2006.
28. NIMH CGI: Clinical Global Impression Scale NIMH. *Psychopharmacol. Commun* 1985;21:839–844.
29. Safren, SA.; Sprich, S.; Perlman, CA.; Otto, MW. *Mastering Your Adult ADHD: A Cognitive-Behavioral Treatment Program, Client Workbook*. NY, USA: Oxford University Press; 2005.
30. Safren, SA.; Perlman, CA.; Sprich, S.; Otto, MW. *Mastering Your Adult ADHD: A Cognitive Behavioral Treatment Program, Therapist Guide*. NY, USA: Oxford University Press; 2005.
31. Murphy KR. Psychosocial treatments for ADHD in teens and adults: a practice-friendly review. *J. Clin. Psychol* 2005;61:607–619. [PubMed: 15723366]
32. Favorite B. Coaching for adults with ADHD: the missing link between the desire for change and the achievement of success. *ADHD Report* 1995;3:11–12.
33. Goldstein S. Coaching as a treatment for ADHD. *J. Atten. Disord* 2005;9:379–381. [PubMed: 16371659]
34. Ratey, NA. Life coaching for adult ADHD. In: Goldstein, S.; Teeter Ellison, A., editors. *Clinician's Guide to Adult ADHD: Assessment and Intervention*. CA, USA: Academic Press; 2002.
35. Zwart LM, Kallemyn LM. Peer-based coaching for college students with ADHD and learning disabilities. *J. Postsecondary Educ. Disabil* 2001;15:1–15.
36. Swartz SL, Prevatt F, Proctor BE. A coaching intervention for college students with attention deficit/hyperactivity disorder. *Psychol. Sch* 2005;42:647–656.
37. Ramsay JR, Rostain AL. Psychosocial treatments for attention-deficit/hyperactivity disorder in adults: current evidence and future directions. *Prof. Psychol. Res. Pr* 2007;4:338–346. Review of psychosocial treatments including helpful recommendations for work with adults with ADHD.

38. The MTA Cooperative Group. A 14-month randomized clinical trial of treatment strategies for attention-deficit/hyperactivity disorder. *Arch. Gen. Psychiatry* 1999;56:1073–1086. [PubMed: 10591283]
39. The MTA Cooperative Group. Moderators and mediators of treatment response for children with attention-deficit/hyperactivity disorder: the multimodal treatment study of children with attention-deficit/hyperactivity disorder. *Arch. Gen. Psychiatry* 1999;56:1088–1096. [PubMed: 10591284]
40. Longmore RJ, Worrell M. Do we need to challenge thoughts in cognitive behavior therapy? *Clin. Psychol. Rev* 2007;27:173–187. [PubMed: 17157970]
41. Eakin L, Minde K, Hechtman L, et al. The marital and family functioning of adults with ADHD and their spouses. *J. Atten. Disord* 2004;8:1–10. [PubMed: 15669597]
42. Murray C, Johnston C. Parenting in mothers with and without attention deficit/hyperactivity disorder. *J. Abnorm. Psychol* 2006;115:52–61. [PubMed: 16492095]
43. Biederman J, Faraone SV, Spencer TJ, Mick E, Monuteaux MC, Aleardi M. Functional impairments in adults with self-reports of diagnosed ADHD: a controlled study of 1001 adults in the community. *J. Clin. Psychiatry* 2006;67:524–540. [PubMed: 16669717]
44. Goossensen MA, van de Glind G, Carpentier PJ, Wijsen RM, van Duin D, Kooij JJ. An intervention program for ADHD in patients with substance use disorders: preliminary results for a field trial. *J. Subst. Abuse Treat* 2006;30(3):253–259. [PubMed: 16616170]

Table 1

Diagnostic and Statistical Manual of Mental Disorders-IV criterion A symptoms of attention-deficit/hyperactivity disorder and examples of adult clinical presentations.

Diagnostic criteria*	Examples of adult clinical presentations
<i>Inattention</i> Often fails to give close attention to details or makes careless mistakes in schoolwork, work or other activities Often has difficulty sustaining attention in tasks or play activities Often does not seem to listen when spoken to directly Often does not follow through on instructions and fails to finish schoolwork, chores or duties in the workplace Often has difficulty organizing tasks and activities Often avoids, dislikes or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework) Often loses things necessary for tasks or activities Is often easily distracted by extraneous stimuli Is often forgetful in daily activities	Misses important details in tasks at work or important steps in completing tasks. Submits incomplete forms Moves on to another project or task without completing the first task. Becomes 'bored' easily by the task at hand. Complains of a 'short attention span' Appears 'spacey' and distracted to others. Has to be given verbal instructions repeatedly. Spouse/partner complains that individual 'doesn't listen' Chronic difficulty completing the last few steps necessary to finish a project. Has multiple half-completed projects around the house. Low workplace productivity. Difficulty keeping promises or fulfilling obligations for others Often cannot figure out where to start on a project and the appropriate order of steps. Physical space is messy and disorganized. Focuses on less important details of a task. Difficulty seeing the 'big picture' and the steps necessary to get there Low tolerance for even brief boring, nonstimulating tasks. Avoids tedious tasks, resulting in neglecting to take care of important responsibilities (e.g., filing taxes) Constantly misplaces keys, wallet, cell phone or other important objects. Often cannot find important papers or computer files necessary to complete tasks Constantly off-task due to distractions from others, the internet or anything else more interesting than the task at hand. Complains of often being distracted by unrelated, irrelevant thoughts during tasks or conversations Chronically late to appointments because he or she forgets them. Misses time-sensitive obligations to others. Often forgets to complete important tasks later in the day. Poor prospective memory
<i>Hyperactivity-impulsivity</i> Often fidgets with hands or feet or squirms in seat Often leaves seat in classroom or in other situations in which remaining seated is expected Often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness) Often has difficulty playing or engaging in leisure activities quietly Is often 'on the go' or often acts as if 'driven by a motor' Often talks excessively Often blurts out answers before questions have been completed Often has difficulty awaiting turn Often interrupts or intrudes on others (e.g., butts into conversations or games)	Appears more restless than the average adult, especially in nonstimulating situations. Fidgeting persists across several types of situations. Others complain that the person is constantly tapping things, in motion, etc. Finds it difficult to sit through a work meeting, college lecture or religious service without finding an excuse to get up (e.g., going to the bathroom) Complains of almost constant urge to get up and move around. Endorses 'mental restlessness'. Mounting discomfort when physical movement is not possible Others complain about excessive noisiness (e.g., loud talking and 'banging around'). Cannot engage in quiet, solitary activity for extended periods of time (e.g., reading a book) Constantly moving from one activity to another. Can't seem to sit down and 'just relax' Difficulty inhibiting talking when it is inappropriate or in relation to the social context. Others complain they can't 'get a word in edgewise'. The adult notices that others become annoyed and disinterested when they are talking Constantly finishing others' sentences. Answers questions before he or she has fully understood what is being asked Will avoid standing in lines because it is almost painful to have to wait. Low frustration tolerance in situations requiring waiting (e.g., in traffic and standing in line at the bank). Will sometimes leave situations, such as stores, if there is a line Dominates conversations and may appear disinterested in what others have to say, waiting for his or her next turn to talk. Asks socially inappropriate questions. Interrupts others while they are talking or while they are busy with another task. Others complain that he or she seems inconsiderate or pushy. May report that he or she must 'work hard' to resist these urges and show restraint

* Six or more inattentive and/or hyperactive-impulsive symptoms that have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level.

Note: An adult ADHD diagnosis is not based on symptom counts alone. A diagnosis of ADHD also requires onset of symptoms with impairment in childhood, impairment present in two or more settings, clear evidence of clinically significant impairment and that symptoms are not better accounted for by another disorder. For adults, relevant settings can include home, work, educational settings, romantic relationships, social settings, parenting role, driving a motor vehicle and dealing with others in the community. DSM-IV also specifies that, for individuals who have symptoms that no longer meet full criteria (but did in the past), ADHD in partial remission may be diagnosed.

ADHD: Attention-deficit/hyperactivity disorder; DSM: Diagnostic and Statistical Manual of Mental Disorders.

Table 2
Earlier psychosocial treatment studies for attention-deficit/hyperactivity disorder in adults.

Study	Study design	Treatment	Participants	Measures	Outcomes	Comments	Ref.
Wilens <i>et al.</i> (1999)	Chart review of one therapist's clinic patients	Individual cognitive therapy combined with medication treatment; mean number of treatment sessions = 36; treatment objectives: stop, re-evaluate and modify thoughts that led to negative emotional reactions and forms of avoidance	n = 26	Clinician ratings with CGI	Significant decrease in CGI from baseline to medication stabilization, and from medication stabilization to cognitive therapy end point	Limited by challenges to internal validity, long and variable course of treatment	[12]
Wiggins <i>et al.</i> (1999)	Controlled trial: waitlist control; randomization not indicated	Group psychoeducation: 4 sessions; treatment objectives: introduction and basic ADHD characteristics; goal setting and time management; task completion; organizing physical environment and prioritization	n = 17 (9 treatment, 8 control)	Self-report ADHD and organizational skills checklists	Post-treatment: treatment group showed significant reduction in disorganization, inattention and emotional lability compared with controls; also showed reductions in self-confidence	Decrease in self-confidence may be an effect of group members becoming more aware of their impaired functioning	[13]
Hesslinger <i>et al.</i> (2002)	Nonrandomized controlled trial: waitlist control	Group dialectical behavioral therapy: modified; 13 sessions; (see text for details of treatment)	n = 15 (8 treatment, 7 control)	Self-report ADHD symptoms and depression Neuropsychological testing	Post-treatment: treatment group had significant improvements in depression and ADHD symptoms; control group had no improvements on any measures	4 of 7 control participants were lost to follow-up; no treatment group participants dropped out, suggesting the treatment was acceptable to patients	[14]
Stevenson <i>et al.</i> (2002)	Randomized controlled trial: waitlist control; follow-up data collected from treatment group only	Group cognitive remediation program: 8 clinician-led sessions with workbook; Individual support person for each patient; Treatment objectives: retraining cognitive functions, development of internal and external coping strategies, restructuring one's environment	n = 43 (22 treatment, 21 control)	Self-report ADHD symptoms, organizational skills, self-esteem, anger	Post-treatment: treatment group reported significantly greater improvement compared with controls in: ADHD symptoms, organizational skills, self-esteem and state anger. 2-month and 1-year follow-up: treatment group reported significantly lower ADHD symptoms, better organizational skills, better self-esteem and lower trait anger compared with their baseline	Authors note that conclusions are limited by reliance on self-report measures	[15]
Stevenson <i>et al.</i> (2003)	Randomized controlled trial: waitlist control; follow-up data collected from treatment group only	Group cognitive remediation program with minimal therapist contact: self-help workbook, similar to above; 3 clinician-led sessions; individual support person	n = 35 (17 treatment, 18 control)	Self-report ADHD symptoms, organizational skills, self-esteem, anger	Post-treatment: treatment group reported significantly greater improvement compared with controls in: ADHD symptoms, organizational skills, self-esteem and state and trait anger. 2-month follow-up: treatment group reported significantly lower ADHD symptoms, better organizational skills and	Potentially cost-effective method combining self-help with nonprofessional supportive person	[16]

Study	Study design	Treatment	Participants	Measures	Outcomes	Comments	Ref.
ADHD: Attention-deficit/hyperactivity disorder; CGI: Clinical Global Impressions Scale.							
					lower trait anger compared with their baseline		

Table 3
Recent psychosocial treatment studies for adult ADHD.

Study	Study design	Treatment	Participants	Measures	Ref.
Safren <i>et al.</i> (2005)	Randomized controlled trial	Individual CBT for medication-treated adults with ADHD and residual symptoms	n = 31 (16 treatment and 15 continued psychopharmacology only)	Clinician ratings self-report	[25]
Rostain and Ramsay (2006)	Open trial	Individual CBT and medication treatment	n = 43	Clinician ratings	[24]
Philipsen <i>et al.</i> (2007)	Open trial	Group modified dialectical behavior therapy	n = 72	Self-report	[17]
Solanto <i>et al.</i> (2008)	Open trial	Group metacognitive therapy	n = 30	Self-report	[20]
Virta <i>et al.</i> (2008)	Open trial	Group cognitive behaviorally oriented rehabilitation	n = 29	Self-report	[21]
Zylowska <i>et al.</i> (2008)	Open trial	Group mindfulness meditation training	n = 30 (24 adults, 8 adolescents)	Self-report cognitive testing	[23]

ADHD: Attention-deficit/hyperactivity disorder; CBT: Cognitive-behavioral therapy.