16

Varieties of Psychotherapy for Attention-Deficit Hyperactivity Disorder

An Evidence-Based Evaluation

Anca Dobrean,[1] Costina R. Păsărelu,[1] and Manfred Döpfner[2]

[1] *Department of Clinical Psychology and Psychotherapy, International Institute for the Advanced Studies of Psychotherapy and Applied Mental Health, Babeș-Bolyai University, Cluj-Napoca, Romania*
[2] *Department of Child and Adolescent Psychiatry and Psychotherapy, University of Cologne, Cologne, Germany*

16.1 Description of the Disorder

Attention-deficit hyperactivity disorder (ADHD) is a neurodevelopmental disorder characterized by attention deficits and hyperactive behaviors. According to the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2013), ADHD can be divided into three subtypes based on the inattention and hyperactivity dimensions: a predominantly inattentive type, a predominantly hyperactive–impulsive type, and a combined hyperactive–inattentive type. The worldwide prevalence of ADHD is approximately 3.4% for children and adolescents (Polanczyk, Salum, Sugaya, Caye, & Rohde, 2015) and 5% for adults (Willcutt, 2012). More males tend to be affected than females. ADHD interferes with academic performance (Loe & Feldman, 2007) and is associated with a high risk for comorbid conditions, such as conduct disorders (Waschbusch, 2002), anxiety (Jarrett & Ollendick, 2008), depression (Blackman, Ostrander, & Herman, 2005), accidental injuries (Nigg, 2013), and suicidality (Barbaresi et al., 2013).

ADHD is a major public health concern as the disease is burdensome on both individuals and society (Pelham, Foster, & Robb, 2007; Robb et al., 2011). The annual costs related to education, treatment, and juvenile justice for ADHD children and adolescents are estimated to be around $43 billion. For adults, ADHD results in approximately 121 million missed work days, with $20 billion lost in salary alone (Pelham et al., 2007). Costs associated with ADHD are comparable to those associated with major depression and stroke (Pelham et al., 2007). Therefore, the development of effective treatments for ADHD is important on both the individual and the societal levels.

Guidelines from the National Institute for Health and Care Excellence (previously the National Institute for Health and Clinical Excellence [NICE], 2008) recommend pharmacotherapy as a first-line treatment in adults with ADHD and in children with severe

cases of ADHD. Pharmacotherapy for ADHD, in the form of stimulant and nonstimulant medications, is recommended, either alone or in combination with psychosocial interventions. Pharmacotherapy is effective in only 70% of cases (Spencer et al., 2005) and is associated with several side effects in the short term (e.g., delayed sleep, reduced appetite, headaches, abdominal pain); however, the long-term safety of pharmacotherapy for ADHD is insufficiently investigated (Clavenna & Bonati, 2014). Another important issue related to the use of medications for ADHD is that medication adherence rates decrease throughout adolescence; up to 70% of teenagers stop taking their ADHD medications by the age of 15 (Wolraich et al., 2005). An active debate also remains regarding whether pharmacotherapy improves functional impairments associated with ADHD, as studies have shown that medications are less effective for improving functional deficits (e.g., positive social behaviors, peer rejection) as compared to their effects on core ADHD symptoms (Langberg & Becker, 2012; Nijmeijer et al., 2008).

Another type of treatment for ADHD is dietary interventions. Three main types of dietary interventions that have been investigated in the treatment of ADHD are increased omega-3 fatty acids, few foods diet, and artificial food color elimination. However, according to a recent systematic review, more research needs to be conducted in order to establish the efficacy and mechanisms of change of dietary interventions for ADHD (Pelsser, Frankena, Toorman, & Rodrigues Pereira, 2017).

Regarding psychological treatments recommended for people with ADHD, clinical guidelines have been established that take into account patient age and ADHD severity. For example, for preschool and school-aged children with moderate ADHD severity, the NICE (2008) guidelines recommend parent training programs as the first-line treatment. For adolescents, NICE recommends individual or group CBT and skills training. For adults with ADHD, pharmacotherapy (methylphenidate; e.g., Ritalin) is recommended first, except in cases in which the patient actively requests another form of treatment (e.g., psychotherapy). Still, not all governing bodies and professional associations make the same recommendations. While NICE (2008) recommends medication as the first-line treatment for adults with ADHD, based on strong research support, the American Psychological Association Division 12 recommends CBT.

Overall, there are less-than-consistent efficacy data and inconsistent treatment guidelines for ADHD at this time. This state of affairs could lead to confusion on the part of both clinicians and patients. Therefore, a review of the psychological interventions for ADHD is needed in order to help clarify recommendations for patients. David and Montgomery (2011) have proposed a new evaluative framework for evidence-based psychotherapies. The approach classifies psychotherapies on two dimensions: their underlying theory (mechanisms of change) and the therapeutic package derived from that theory. Each of these two dimensions is further organized by three levels: empirically well supported, moderate support (preliminary, equivocal, or mixed data), and no supportive data or findings indicating the treatment is harmful. This organizational scheme results in nine categories. The scheme considers both absolute efficacy (i.e., therapeutic package fares better than a comparison condition) and relative efficacy (i.e., relative to another evidence-based intervention). Furthermore, the authors state that there should also be a clear relationship between a guiding theoretical base and the empirical data collected.

The focus of this chapter is to review psychological interventions for ADHD based on David and Montgomery's (2011) evaluative framework. Clinical guidelines,

Table 16.1 A graphical representation of the classification of psychotherapies for ADHD using David and Montgomery's (2011) evaluative framework.

Therapeutic Package	Theory		
	Well Supported	**Equivocal: No, Preliminary, or Mixed Data**	**Strong Contradictory Evidence**
Well Supported	Category I: Evidence-based psychotherapies Combined treatment	Category II: Intervention-driven psychotherapies CBT; OST; psychoeducation	Category V: Good-intervention- and bad-theory-driven psychotherapies None
Equivocal: No, Preliminary, or Mixed Data	Category III: Theory-driven psychotherapies BPT	Category IV: Investigational psychotherapies CT; mindfulness; NF; SST	Category VII: Bad-theory-driven psychotherapies None
Strong Contradictory Evidence	Category VI: Good-theory- and bad-intervention-driven psychotherapies None	Category VIII: Bad-intervention-driven psychotherapies None	Category IX: Bad-theory- and bad-intervention-driven psychotherapies None

BPT = behavioral parent training; CBT = cognitive–behavioral therapy; CT = cognitive training; NF = neurofeedback; OST = organizational skills training; SST = social skills training. Lighter backgrounds indicate scientifically oriented psychotherapies (the core of these therapies is represented by Category I), while darker backgrounds indicate pseudoscientifically oriented psychotherapies (the core of this category is represented by Category IX).

meta-analyses, literature reviews, and randomized controlled trials (RCTs) were reviewed in order to evaluate both the underlying theory and the specific psychological intervention packages for treating ADHD. In order to evaluate the underlying psychological theory, we searched for data from component analysis, mediation and moderation analyses from complex controlled trials, and experimental and cross-sectional studies that tested the theory independently. Table 16.1 summarizes our findings.

16.2 Classification of Psychotherapies

16.2.1 Category I: Evidence-Based Psychotherapies

Category I includes psychological interventions for which there is strong supporting evidence for both the therapeutic package and the theory of change underlying the clinical protocol. In our review of psychological interventions for ADHD, combined treatment interventions fit this category.

16.2.1.1 Combined treatment

The assumption behind combining pharmacology with psychotherapy is based on the premise that neither form of treatment alone is sufficient to manage ADHD symptoms and resultant impairment. Recent evidence has shown that combined treatments were associated with better clinical results, even with lower doses of both treatments, compared with each intervention alone (Pelham et al., 2014). ADHD treatment guidelines (American Academy of Pediatrics Subcommittee on Attention-Deficit/Hyperactivity

Disorder et al., 2011; NICE, 2008) recommend combined treatment for adults, based on the assumption that behavioral and pharmacological interventions could have additive effects for the reduction of ADHD symptoms (see Klein, Abikoff, Hechtman, & Weiss, 2004; Klein et al., 1997). According to the NICE guidelines (2008), combined psychological and pharmacological treatment is recommended in adults, as well as in children with severe ADHD (group-based behavior parent training plus pharmacological treatment for children).

In the following sections, we consider types of combined treatments (psychotherapy plus medication) that allow direct comparisons between conditions only, as established by the study protocol.

16.2.1.1.1 Absolute efficacy

We were not able to find any studies comparing combined treatment for ADHD with waitlist control. Therefore, the results concerning relative efficacy (see Section 16.2.1.1.2) should be interpreted cautiously (Temple & Ellenberg, 2000).

16.2.1.1.2 Relative efficacy

In the multimodal treatment study of children with ADHD (MTA study; MTA Cooperative Group, 1999), combined treatment (behavioral management plus pharmacology) for ADHD was superior to medication alone, based on parent ratings of conduct problems following treatment. A second RCT shows that medication (methylphenidate) plus behavioral treatment is superior to medication alone (*better than standard treatment*) in the reduction of ADHD symptoms (So, Leung, & Hung, 2008).

16.2.1.1.3 Specific efficacy

The first criterion, regarding equivalence (*equivalent to standard therapies*) or superiority to standard treatment (*better than standard treatment*), is met. We conclude that there are well-supported data regarding the efficacy of the combined treatment therapeutic package.

The second criterion, regarding the empirical support for the underlying theory for specific mechanisms of change, is met. Regarding the underlying theory of the therapeutic package, we found several analyses or secondary analyses based on the MTA study (MTA Cooperative Group, 1999) regarding possible mediators (e.g., adherence to treatment) and moderators (e.g., comorbidity, socioeconomic status, parental depression) of ADHD treatment. An important mechanism of change in combined treatment is parenting, and evidence comes from several RCTs. Reductions in negative and ineffective discipline significantly mediated the efficacy of combined treatment on child outcomes as reported by teachers in the MTA study (Hinshaw et al., 2000). Other evidence on the mechanisms of change comes from a RCT that compared the efficacy of a multicomponent psychosocial intervention with parent-focused treatment and treatment as usual (TAU) in a sample of children with ADHD–inattentive type. Improvements in positive and negative parenting were found to be significant mediators of treatment efficacy on child outcomes (impairment), even after controlling for child inattention symptoms on both parent and teacher ratings (Haack, Villodas, McBurnett, Hinshaw, & Pfiffner, 2016). Another study comparing a multicomponent psychosocial intervention with a parent support and education program reported that reductions in negative parenting significantly mediated the efficacy of the intervention on child outcomes (homework

performance) according to parent (indirect mediation) and teacher reports (total mediation) (Booster, Mautone, Nissley-Tsiopinis, Van Dyke, & Power, 2016). Therefore, we conclude that there are *well-supported data* on the mechanisms of change for combined treatments for ADHD.

16.2.2 Category II: Intervention-Driven Psychotherapies

Category II includes psychological treatments for which there is strong supporting evidence for the efficacy/effectiveness of the therapeutic package but where the results are equivocal (i.e., missing, preliminary, or mixed) for the underlying theory from which the package is derived. In the following sections, we present the psychological interventions for ADHD that meet Category II criteria, namely CBT, psychoeducation, and organizational skills training (OST).

16.2.2.1 Cognitive–behavioral therapy

According to the CBT model of adult ADHD (Safren et al., 2005; Young & Bramham, 2006), repeated negative life experiences of failure and underachievement, mainly due to neurobiological deficits, influence self-esteem and self-concept, giving rise to negative self-beliefs that, consequently, cause dysfunctional emotions (e.g., depression, anxiety). These negative self-beliefs could also be associated with maladaptive behavioral strategies (e.g., negation, procrastination, avoidance) when an individual is confronted with a difficult or attention-consuming task (Ramsay & Rostain, 2008). Even though the dysfunctional belief system does not contribute to the etiology of primary neurocognitive symptoms of ADHD, it does contribute to secondary comorbid symptoms and emotional maladjustment.

   NICE (2008) recommends individual psychological interventions (i.e., CBT or social skills training) for older adolescents with ADHD and moderate impairment, while individual or group CBT adjunctive to medication is recommended for adults. The APA Division of Clinical Psychology also describes CBT interventions for adults as having strong research support. CBT has typically been tested on adults whose ADHD symptoms persist despite treatment with medication.

   The CBT interventions tested so far were delivered in several formats: cognitive rehabilitation programs, dialectical behavioral training, meta-cognitive therapy, and coaching. However, in most of the RCTs, CBT interventions for ADHD were generally used as an adjunct to stimulant medication. CBT sessions have used the following formats: motivational interview, ADHD psychoeducation, behavioral training in organization and planning skills, behavioral skills training to reduce distractibility, and cognitive restructuring.

   Several RCTs have supported the efficacy of CBT for ADHD.

16.2.2.1.1 Absolute efficacy

An RCT comparing group CBT in medicated adolescents with a waitlist control group showed that CBT reduced ADHD symptoms significantly (Vidal et al., 2015). CBT was superior to waitlist based on self-report (Cohen's $d = 7.50$), parental report ($d = 8.38$), and blind evaluator ($d = 7.71$) ratings. In addition to reduced ADHD symptoms, there were significant decreases in functional impairment (parental report: $d = 2.29$; blinded evaluator report: $d = 7.71$). In a pilot RCT, Virta et al. (2010) found that group CBT in

medicated adult patients was more effective than waitlist based on self-reported ADHD total symptoms, attention, memory, and quality of life. Also, Bramham et al. (2009) provided an intensive 1-day intervention (1 day per month for 3 months) to medicated adult patients and compared it with waitlist controls. While significant effects of CBT were found on psychoeducation, self-efficacy, and self-esteem measures, there was no significant effect of CBT on anxiety and depression. In two RCTs conducted by the same team (Stevenson, Stevenson, & Whitmont, 2003; Stevenson, Whitmont, Bornholt, Livesey, & Stevenson, 2002), which investigated the efficacy of a cognitive remediation program in both medicated and nonmedicated ADHD adults as compared to waitlist, the results favored the intervention group in terms of reduced ADHD symptomatology ($d = 1.4$), improved organizational skills ($d = 1.2$), and reduced levels of anger ($d = 0.5$). There were also significant improvements in ADHD symptoms ($d = 1.4$) and organizational skills ($d = 1.3$) at the 1-year follow-up assessment. Additionally, CBT interventions were effective when they were delivered in different formats. For example, in an RCT (Pettersson, Söderström, Edlund-Söderström, & Nilsson, 2014) involving adult ADHD patients on medication, two types of CBT were compared with waitlist. The first was an internet-delivered self-help CBT (iCBT) intervention, while the second intervention was iCBT plus weekly group sessions. There was a significant difference between the iCBT and waitlist ($d = 1.07$), with no significant difference between the two formats of iCBT. Furthermore, in another RCT, a smartphone-delivered CBT intervention for medicated adult patients was better that waitlist. Participants in the CBT group showed significant improvements in inattention and organizational skills on both self-reported and blind assessor measures, as well as significant decreases in hyperactivity and depression. However, no effect was found on anxiety, stress, or overall functioning (Moëll, Kollberg, Nasri, Lindefors, & Kaldo, 2015). Based on these studies, we conclude that CBT is superior to a waitlist control.

16.2.2.1.2   Relative efficacy

Emilsson et al. (2011) found that a group CBT intervention in medicated adult ADHD patients with persistent symptoms was better than TAU control conditions. CBT had a significant effect on ADHD symptoms, with effect sizes in the medium to large range. Safren et al. (2005) compared individual CBT in medicated adult patients with persistent symptoms with continued pharmacotherapy alone. There were superior results for the CBT group in terms of ADHD symptoms ($d = 1.20$ for self-rated), ADHD global severity ($d = 1.40$ for independent assessor rated), anxiety, and depression. Young et al. (2015) compared CBT (both individual and group sessions) with TAU in a sample of medicated ADHD adults and found that CBT was superior to TAU in terms of ADHD symptoms, with medium effect sizes from both blinded assessors and self-ratings (*better than standard treatment*). Namely, this means that the treatment is better than another evidence-based psychological intervention, and both treatments are better than waitlist control conditions.

16.2.2.1.3   Specific efficacy

Based on our review, we argue that there is strong evidence to support CBT as a well-supported treatment package for ADHD, as the first criterion, involving superiority to placebo or equivalence to other standard therapies, is met.

However, the second criterion, regarding empirical support for the underlying theory and mechanisms of change, does not appear to be met. We were able to find only one independent study investigating the validity of the CBT model of ADHD in adults (Torrente et al., 2014). The research documented that dysfunctional cognitions were strongly associated with emotional symptoms and that ADHD participants presented elevated avoidant coping strategies, but these findings were not clearly associated with dysfunctional cognitions or emotions. Several additional correlational studies show that ADHD is associated with negative patterns of thinking. For example, researchers have found a significant positive association between self-reported cognitive distortions and ADHD, with perfectionism being the most prevalent cognitive distortion found in ADHD adult patients (Strohmeier, Rosenfield, DiTomasso, & Ramsay, 2016). Further evidence sustaining the CBT model in ADHD patients comes from a study comparing adults diagnosed with ADHD (archival chart review) with nonclinical controls (undergraduate students) (Mitchell, Benson, Knouse, Kimbrel, & Anastopoulos, 2013). Results indicated a positive association between inattention and negative automatic thoughts on self-, other- and clinician ratings; however, no significant association was found between hyperactivity and negative automatic thoughts. Moreover, for all three types of raters, the association between ADHD–inattentive symptoms and negative automatic thoughts remained stable even after controlling for depression associated with ADHD. An ongoing RCT aims to examine the mechanisms of change of CBT for ADHD (Dittner, Rimes, Russell, & Chalder, 2014), but the results are not yet available. According to David and Montgomery's (2011) framework, we would view these studies as providing *preliminary data* in support of the underlying theory of CBT. Future RCTs investigating the mediator/moderator role of proposed mechanisms of change (e.g., negative automatic thoughts, worry, cognitive distortions) in the relationship between the efficacy of CBT interventions and ADHD outcomes are needed to establish that the theory on which CBT interventions are based is well supported.

16.2.2.2 Psychoeducation

Psychoeducation that includes offering information about the illness and its treatment, skills development, and patient empowerment is considered a well-established evidence-based practice for some severe psychiatric disorders in adulthood. Psychoeducation sessions can be delivered in several formats, including to parents alone or to both parents and their children. Sessions can also be specifically designed for teachers. These sessions are structured as didactic presentations, discussions, role-playing, homework role-playing, token reinforcement systems, contingency management techniques, and problem-solving plans. European and NICE guidelines on ADHD have suggested that psychoeducation programs might be useful in the management of ADHD (Ferrin & Taylor, 2011; NICE, 2008).

In terms of treatment package, we will refer to several RCTs regarding the efficacy of psychoeducation for ADHD.

16.2.2.2.1 Absolute efficacy

In an RCT, psychoeducation delivered for school teachers was better than waitlist control, with moderate to large effect sizes (*better than waitlist*) on outcomes related to ADHD knowledge, attitudes, and behavioral treatment interventions (Lasisi, Ani, Lasebikan, Sheikh, & Omigbodun, 2017).

16.2.2.2.2 Relative efficacy

In an RCT, a psychoeducational program for families of ADHD children was better than TAU with respect to ADHD symptoms (total symptoms, inattention, and hyperactivity), with medium to large effect sizes on parent ratings, no differences on teacher ratings, and improvements on clinician ratings (Ferrin et al., 2016). In one pilot RCT comparing psychoeducation with a standard intervention, Vidal et al. (2013) found psychoeducation to be as effective as CBT in ADHD-medicated adult patients (*equivalent to standard therapies*), with significant improvements on inattention, hyperactivity, impulsivity, self-esteem, anxiety symptoms, and depression in both groups. Furthermore, improved quality of life and lower global severity of symptoms were reported by both patients and clinicians.

16.2.2.2.3 Specific efficacy

The first criterion, involving superiority to placebo or equivalence to other standard therapies, was met. Based on the data already presented, we conclude that the therapeutic package is *well supported*.

The second criterion, regarding the empirical support for the underlying theory for specific mechanisms of change in the case of the therapeutic package, is not met, as we were not able to find mediation/moderation analyses or component analyses from complex controlled trials investigating mechanisms of change. There is only preliminary evidence on the mechanisms of change of psychoeducation. In a systematic review of the effects of psychoeducation interventions on ADHD and Tourette syndrome, researchers proposed several mechanisms explaining how psychoeducation can influence ADHD outcomes (Nussey, Pistrang, & Murphy, 2013). One mechanism is through parents' knowledge related to ADHD, which presumably influences their attitudes, intentions, and behaviors regarding ADHD treatment, which is congruent with the theory of planned behavior (Ajzen, 1991). One study conducted with a sample of parents of children diagnosed with ADHD referred for treatment found that parental knowledge influences parents' probability to enroll their children in ADHD treatments (both pharmacological and nonpharmacological) (Corkum, Rimer, & Schachar, 1999). Psychoeducation can improve ADHD outcomes via another important mechanism, namely adherence to treatment. In one study, in which parents of children diagnosed with ADHD were randomized to either psychoeducation or clinical counseling, participants in the former condition had greater improvement in ADHD symptoms, increased parental knowledge about ADHD, and better adherence to medication (Bai, Wang, Yang, & Niu, 2015). We conclude that there are *preliminary data* regarding mechanisms of change in the effectiveness of psychoeducation. More evidence from complex controlled trials in which the proposed mechanisms (e.g., ADHD knowledge) mediate the efficacy of psychoeducation interventions in ADHD outcomes is needed to validate theories for this therapeutic package.

16.2.2.3 Organizational skills training

OST helps children develop the ability to organize materials and to plan. Specifically, children learn new tools and routines to record assignments and organize school papers, and they learn to use checklists for materials needed, for time management strategies, and to break tasks into graded steps. Moreover, skills training is combined with rewards to encourage the child to use these skills in the school setting. Parents and teachers are trained to use contingency management appropriately in order to reward children's

planning skills. An example of such an intervention is Homework, Organization, and Planning Skills (Langberg, 2011), which focuses on improving participants' physical organization and homework management.

In terms of treatment package, we will refer to several RCTs and meta-analyses regarding the efficacy of organizational skills interventions for ADHD.

16.2.2.3.1 Absolute efficacy

A recent meta-analysis including 12 studies indicated that OST produces changes associated with large effect sizes on parent-reported organizational skills and medium effect sizes on teacher-reported organizational skills (Bikic, Reichow, McCauley, Ibrahim, & Sukhodolsky, 2017). With regard to inattention symptoms, the same meta-analysis indicated small (teacher) to medium (parent) effect sizes, while for academic performance the effect sizes were small for both teacher and parent ratings. An RCT (Abikoff et al., 2013) comparing an organizational skills intervention, a performance-based intervention, and a waitlist condition in elementary-school-aged children (8–11 years) found that the organizational skills training produced superior outcomes, according to self-, parent, and teacher ratings of organization, academic functioning, homework completion, and family functioning as compared with a waitlist condition; when compared with the performance-based intervention, the only significant difference was on parent-reported child organizational skills. These results were replicated by another RCT (Langberg, Epstein, Becker, Girio-Herrera, & Vaughn, 2012) involving adolescents (11–14 years) who showed significant parent-rated improvements for organized actions, task-planning, and homework completion that were maintained at 3-month follow-up.

16.2.2.3.2 Relative efficacy

An RCT that compared an OST intervention (Child Life and Attention Skills) with parent training and TAU indicated that OST was superior to both conditions via teacher and parent reports on measures of inattention, organizational and social skills, and global functioning (Pfiffner et al., 2014). In another RCT conducted with adolescents, OST, namely the program Supporting Teens' Autonomy Daily combined with motivational interviewing, was better than TAU with respect to parent-reported outcomes (symptom severity, disruptive behavior, organizational problems, homework, home privileges, parent–adolescent contracting, parenting stress) (Sibley et al., 2016). OST in medicated children (ages 8–13) was better than placebo (Abikoff et al., 2009); however, the organizational functioning of the majority of children still remained in the clinical range.

16.2.2.3.3 Specific efficacy

The first criterion, involving superiority to other standard therapies, is met.

The second criterion, regarding the empirical support for the underlying theory for specific mechanisms of change pertinent to the therapeutic package, is not met. Regarding theory, researchers investigated therapeutic alliance and organization skills as mechanisms of change in a cross-sectional study involving children aged 11–14. Changes in organizational skills were significant predictors of parent-reported outcomes (organization, planning, homework problems), even after controlling for the effect of the therapeutic alliance (Langberg, Becker, Epstein, Vaughn, & Girio-Herrera, 2013). Another study conducted by the same team found that the working alliance between therapist and adolescent, parenting stress, and conflict between parent and adolescent are important predictors of OST treatment efficacy (Langberg et al., 2016). We were not able

to find other studies investigating mechanisms of change in OST using component or mediation/moderation analyses based on complex controlled trials. Accordingly, there are *preliminary data* for the theory of change behind OST.

16.2.3   Category III: Theory-Driven Psychotherapies

Category III includes psychological treatments for which there is strong supporting evidence for the underlying theory but where the treatment package is insufficiently supported (equivocal results). In this category we include behavioral parent training (BPT) for ADHD.

16.2.3.1   Behavioral parenting training

BPT is listed as having strong support by NICE (2008). BPT is recommended for children with mild to moderate ADHD. BPT is based on learning theory, and it is grounded in principles of classical conditioning, operant conditioning, cognitive–behavioral theory, and social learning theory. In this approach, parents manipulate the antecedents and consequences of child behaviors in order to increase desired behaviors and decrease undesirable ones. Recent developments in this type of intervention came with an enhancement of traditional interventions: telephone-based BPT (McGrath et al., 2011) and BPT for single mothers (Chacko et al., 2008) or fathers (Fabiano et al., 2009, 2012). The aim of "behavioral classroom management" interventions is to help teachers and students gain control over behavior at school (Miranda, Presentación, & Soriano, 2002). Consequently, behavior modification techniques are applied in the school setting in line with NICE (2008) recommendations, which state that teachers should receive training about ADHD and its management, and teachers should provide behavioral interventions in the classroom in order to help children and young people with ADHD. Examples of such interventions are summer treatment programs (Pelham & Hoza, 1996), which engage children in a controlled camp-like setting, or the use of daily report cards (Volpe & Fabiano, 2013) intended to facilitate parent–teacher communication regarding the assessment of behavior throughout a day. The rationale for "behavioral peer interventions" is that, through staff being trained to manipulate contingencies in several settings where children and peers are present, ADHD children will demonstrate improvements in social functioning across settings. More recently, telephone-assisted self-help interventions for parents of children with ADHD have been developed based on principles of parent management training. Written booklets and additional telephone calls with parents were used to help the parents change their parenting behavior and to reduce the ADHD symptoms of the child. Several studies found effects of these kinds of interventions in preschool children (e.g., Kierfeld, Ise, Hanisch, Görtz-Dorten, & Döpfner, 2013), with effects maintained at a 1-year follow-up (Ise, Kierfeld, & Döpfner, 2015). Moreover, this intervention enhances the effects of methylphenidate treatment in families who complete the intervention (Dose et al., 2016). A meta-analysis also found substantial effects of self-help behavioral interventions (O'Brien & Daley, 2011).

16.2.3.1.1   *Absolute efficacy*

Several meta-analyses have reported weak support for parental training. For example, Sonuga-Barke et al.'s (2013) meta-analysis found that effect sizes for behavioral interventions dropped to nearly zero when data were collected from blinded informants.

Hodgson, Hutchinson, and Denson's (2014) meta-analysis documented that behavior modification, school-based behavior therapy, behaviorally based parent training, and behavioral self-monitoring treatments each had negative effect sizes when compared with comparison conditions. A meta-analysis of RCTs comparing parent training with no treatment, waitlist, or TAU, in children aged 5–18 (Zwi, Jones, Thorgaard, York, & Dennis, 2011), indicated significant changes on parent-related outcomes (e.g., parental stress, parental confidence); however, there were many methodological problems in the studies, which raise questions regarding their quality. Abikoff et al. (2014) investigated specialized and generic programs of parent training compared with waitlist and found that the parent-reported improvements were not corroborated with teacher ratings or objective observations. In a RCT that compared the Incredible Years parent and child training program in preschoolers (ages 4–6) with waitlist, there were significant treatment effects for children's externalizing (on both parent and teacher reports), hyperactivity, inattentive and oppositional behaviors, emotion regulation (on parent report only), social competence (on both parent and peer observations), emotion vocabulary, and problem-solving ability (on parent report only) (Webster-Stratton, Reid, & Beauchaine, 2011). However, for decades, many RCTs have supported behavioral parenting therapies. For example, Sonuga-Barke, Daley, Thompson, Laver-Bradbury, & Weeks, 2001) compared BPT with parental counseling and support, and with waitlist and found that BPT was more effective than waitlist (*better than waitlist*). The effect sizes of the impact of the New Forest Parenting Package on ADHD versus waitlist control were 0.87 (parent reports) and 0.43 for direct observations of attention (Sonuga-Barke, Thompson, Abikoff, Klein, & Brotman, 2006). Another RCT found that, compared with waitlist, BPT was better at reducing ADHD symptoms and associated problems in preschoolers (Herbert, Harvey, Roberts, Wichowski, & Lugo-Candelas, 2013).

16.2.3.1.2   Relative efficacy

In the MTA study (MTA Cooperative Group, 1999), the behavioral training group was inferior to both the methylphenidate intervention group and the combined treatment group in terms of reducing core ADHD symptoms. Thompson et al. (2009) compared BPT with TAU in a small-scale RCT (the Revised New Forest Parenting Program) involving preschoolers with ADHD and reported a large effect size for the BPT group ($d = 1.36$) on ADHD symptoms with significant effects persisting 9 weeks postintervention. A recent study investigating treatment sequencing shows that BPT was superior to medication on outcomes such as observed classroom violation rules and disciplinary events (Pelham et al., 2016).

16.2.3.1.3   Specific efficacy

The first criterion, involving superiority to placebo or equivalence to other standard therapies, is not met (see Section 16.2.3.1.2). Based on the data presented above, we would argue that there are equivocal, *mixed data* regarding the superiority of the intervention over placebo or standard treatment due to different reported outcomes from blinded and unblinded raters.

The second criterion, regarding the empirical support for the underlying theory for specific mechanisms of change in the case of the therapeutic package, is met. Parenting is the active ingredient of BPT interventions, and the RCTs that supported the mediator

role of parenting in the relationship between treatment and outcomes have already been presented in Section 16.2.1.1 (see Booster et al., 2016; Haack et al., 2016). Data that support the theoretical rationale for the treatment package come from a pilot study (Van den Hoofdakker et al., 2012) based on the data from a RCT comparing BPT plus ongoing routine clinical care with routine clinical care alone in children aged 4–12 with ADHD. The study found that genetic differences in the dopamine transporter gene moderate responses to behavioral parent training in children with ADHD. Given the aforementioned evidence, we assume that the theory on which the BPT therapeutic package is based is *well supported.*

16.2.4   Category IV: Investigational Psychotherapies

Category IV includes psychological treatments for which the evidence for both components (treatment package and underlying theory) is insufficiently tested: There is neither strong supporting nor contradictory evidence for the efficacy/effectiveness of the therapeutic package and for the theory of change underlying it. In addition, the evidence for both components is equivocal (i.e., missing, preliminary, or mixed). Next, we present the intervention-driven psychotherapies for ADHD. In this category, we include social skills training (SST), cognitive training interventions, neurofeedback training, and mindfulness-based interventions.

16.2.4.1   Social skills training

SST helps ADHD children learn useful strategies for improved interactions with peers. According to de Boo and Prins (2007), ADHD is not a knowledge deficit as much as it is a performance disorder. In fact, ADHD children's problems in social behaviors appear to stem from their impulsivity or poor emotional regulation, which prevents them from putting what they know into practice. Therefore, new approaches to SST are based on a shift in researchers' perspective: Children with ADHD do not lack social knowledge; rather, they experience difficulties applying that knowledge in real-world situations with peers. In these interventions, parents and teachers provide contingencies, reminders, and reinforcements to children with ADHD in order to help them perform socially skilled behaviors in naturalistic settings with peers. The ultimate goal is to help the children internalize these skills and to be able to implement them in new contexts. Therefore, the main aim of these interventions is not to teach social skills but rather to help children use social skills in everyday settings. SST for children with ADHD includes sharing, making conversation, joining new groups of peers, following rules when playing games, taking turns, calming down when upset, and identifying emotions. Several SST programs exist, and one example is Parental Friendship Coaching (Mikami, Lerner, Griggs, McGrath, & Calhoun, 2010), which trains parents to offer instructions in social skills knowledge in order to provide environmental contingencies and structure needed to facilitate children's generalization of skills to real-world peer situations.

In terms of the treatment package, we refer to several RCTs and meta-analyses regarding the efficacy of social SST interventions for ADHD.

16.2.4.1.1   *Absolute efficacy*

A Cochrane Review (Storebø, Gluud, Winkel, & Simonsen, 2012) on SST for children aged 5–12 versus either no intervention or waitlist control reported that there were no statistically significant treatment effects on social skills competences, teacher-rated

general behavior, or ADHD symptoms. However, these results should be interpreted cautiously as there were only a few RCTs included, and they were associated with a high risk of bias. In an RCT of medicated children (aged 8–12) with inattentive and combined type ADHD, researchers compared SST (8 weeks of SST treatment) with a no-intervention control group. SST produced improvements in cooperation, empathy, and assertion skills, but no improvement was seen in social competence (Antshel & Remer, 2003). Empirical evidence suggests that intensive involvement of parents or teachers in SST may increase the likelihood that children will generalize positive social behaviors to real-world situations with peers. Pfiffner and McBurnett (1997) showed that an intervention combining SST with group treatment for parents, in which parents learned to reinforce their child's display of competent social behaviors outside sessions, is better than SST only involving children or a no-intervention control group. According to teacher reports, improvements generalized to school settings as well. In an RCT conducted by the same team and involving only children with ADHD–inattentive type, a program involving simultaneous child SST and parent groups to encourage the child's generalization of social skills was *better than a no-treatment* control group on both parent and teacher reports of social behaviors (Pfiffner et al., 2007). In a pilot randomized study (Mikami et al., 2010), an intervention to train parents to be social coaches (Parental Friendship Coaching) was *better than no treatment* on both parent and teachers reports on social behaviors and showed more acceptance and less rejection from peers compared with a control.

16.2.4.1.2   Relative efficacy
An RCT comparing a social skills intervention (combined with parent training and standard treatment) with standard treatment found no significant effect of the former intervention (Storebø et al., 2011).

16.2.4.1.3   Specific efficacy
The first criterion, involving superiority to placebo or equivalence to other evidence-based therapy, is not met. Based on the evidence presented, we assume that there are equivocal, *mixed data* regarding the therapeutic package.

The second criterion, regarding the empirical support for the underlying theory for specific mechanisms of change in the case of the therapeutic package, is not met. In an RCT (Mikami et al., 2010), changes in some parenting behaviors during peer interactions, namely parent facilitation of successful behaviors, correction of child behavior, and reductions in criticisms, mediated the effect of training on child peer functioning. A recent meta-analysis investigating the relationship between ADHD and social functioning indicated a significant association between ADHD and peer functioning, social skills, and information-processing (Ros & Graziano, 2017). We would qualify the findings as providing *preliminary data* for the theory behind SST.

16.2.4.2   Cognitive training interventions
As executive function deficits are frequently included in most of the current ADHD models (Barkley, 1997; Rapport et al., 2008; Willcutt, Doyle, Nigg, Faraone, & Pennington, 2005), cognitive training interventions aim to improve ADHD symptoms by targeting deficient neuropsychological functions associated with ADHD pathology. According to a neuropsychological theory, ADHD symptoms are the result of a primary deficit in executive functions (Barkley, 1997). In most of the studies on executive

functioning, the targeted deficits are attention control, working memory, and inhibitory control. Cognitive training interventions consist of repeated and graded exposure to cognitive stimuli (Rabipour & Raz, 2012) in a game format in which difficulty is adjusted for the child on a trial-by-trial basis, becoming more difficult as the training advances. Cogmed training is probably the most investigated cognitive training program, and it has been adapted for both preschoolers and older children (Cogmed JM and RM) as well as for adults (Cogmed QM). The intervention is delivered in a videogame format in which the participant responds to several visuospatial and verbal memory tasks.

In terms of the treatment package, we refer to recent meta-analyses and several RCTs regarding the efficacy of cognitive training interventions for ADHD.

16.2.4.2.1 Absolute efficacy

A meta-analysis (Cortese et al., 2015) based on data from 16 RCTs comparing cognitive training interventions with a control (waitlist, TAU, placebo, or sham) reported significant effects on total ADHD and inattentive symptoms for unblinded raters, proximal to the treatment setting (parents). Working memory interventions implemented alone had no effect on key measures, while multiprocess training approaches produced large effect sizes on total ADHD based on proximal assessments. However, when blinded raters were considered, there were small effect sizes on total ADHD. Finally, when compared with active training, placebo conditions, or sham conditions, which involved other computer or alternative interventions, cognitive training had nonsignificant effects on total ADHD for both blinded and unblinded raters. These results have been supported in other meta-analyses (see Sonuga-Barke et al., 2013; Rapport, Orban, Kofler, & Friedman, 2013). Given the mixed results, we will not consider investigating relative or specific efficiency further. Therefore, regarding the *therapeutic package*, the data are *equivocal and mixed data*. Regarding the *underlying theory*, a longitudinal study (Coghill, Hayward, Rhodes, Grimmer, & Matthews, 2014) found that changes in executive functions are nonsignificant predictors of changes in ADHD symptoms. An RCT investigated predictors and moderators of cognitive training for children with ADHD and indicated that the effect of cognitive training on ADHD is moderated by several variables, such as type of ADHD, comorbid conditions presented, medication, and initial verbal and visual working memory skills (Van der Donk, Hiemstra-Beernink, Tjeenk-Kalff, Van der Leij, & Lindauer, 2016). Therefore, we consider this evidence to be *preliminary data* related to the mechanism of change for cognitive training.

16.2.4.3 Neurofeedback training

The aim of neurofeedback training is to achieve control of particular brain activity patterns using electroencephalographic (EEG) technology. The two most common neurofeedback protocols that have been applied are EEG frequency-band (i.e., theta/beta) training and the training of slow cortical potentials. In theta/beta frequency-band training, children learn to decrease activity in the theta band of the EEG (4–8 Hz) and to increase activity in the beta band (13–20 Hz), whereas in the training of slow cortical potentials the aim is to regulate cortical excitability (Gevensleben, Holl, Albrecht, Schlamp et al., 2009). The intervention is delivered as a computer game in which participants receive visual and auditory rewards each time brain activity patterns change in the desired direction (Gevensleben, Rothenberger, Moll, & Heinrich, 2012).

In terms of treatment package, we refer to several randomized trials and meta-analyses regarding the efficacy of neurofeedback for ADHD.

16.2.4.3.1   Absolute efficacy

In a meta-analytic review (Hodgson et al., 2014) compared various types of interventions to no treatment, waitlist, placebo, or alternative treatment. Neurofeedback training had an average weighted effect size ($d = 0.21$) across 20 outcomes, resulting in statistically significant improvements in inattention symptoms, neuropsychological test performance, and impulsivity behavior (*better than waitlist*).

16.2.4.3.2   Relative efficacy

In a meta-analysis comparing neurofeedback with active interventions and sham (placebo) (Micoulaud-Franchi et al., 2014), results revealed significant reductions in ADHD symptoms using unblinded assessments (parents) but not when teacher assessments were used. When compared with standard pharmacological treatment, neurofeedback interventions for children aged 7–14 (Meisel, Servera, Garcia-Banda, Cardo, & Moreno, 2014) produced similar effects on both ADHD symptoms and functional impairments, with maintained gains at both follow-up assessments. In one RCT on ADHD participants (aged 6–18), neurofeedback alone was as effective as stimulation drug treatment alone or combined treatment (Duric, Assmus, Gundersen, & Elgen, 2012). However, this study used blinded raters. In one RCT, neurofeedback was inferior to pharmacological treatment in children and adolescents aged 7–16 (Ogrim & Hestad, 2013) based on parent and teacher ratings, with no blinded raters.

16.2.4.3.3   Specific efficacy

The first criterion, involving superiority to placebo or equivalence to other standard therapies, is not met (see Section 16.2.4.3.2). Based on the data presented, we conclude that there are equivocal, *mixed data*.

The second criterion, regarding the empirical support for the underlying theory for specific mechanisms of change in the therapeutic package, is not met, as there are only *preliminary data*. An experimental study comparing neurofeedback with waitlist provides evidence regarding neurofeedback mechanisms of change, as the results of this study indicated significant changes in the medial frontal cortices involved in response inhibition in the neurofeedback group only (Bluschke, Broschwitz, Kohl, Roessner, & Beste, 2016). Despite a few studies that found certain normalization of EEG and event-related potential after neurofeedback training (Bakhshayesh, Hänsch, Wyschkon, Rezai, & Esser, 2011; Doehnert, Brandeis, Straub, Steinhausen, & Drechsler, 2008; Monastra, Monastra, & George, 2002) and a reduction of theta activity (Gevensleben, Holl, Albrecht, Vogel et al., 2009), further evidence is needed in order to establish the underlying theory of neurofeedback interventions.

Given the available evidence on neurofeedback, recent technological developments, such as functional magnetic resonance imaging (fMRI), present new, promising interventions for patients with ADHD, such as real-time fMRI neurofeedback (rt-fMRI neurofeedback). In this intervention, participants learn to regulate their brain activity voluntarily by receiving information on how to do so while in the scanner. However, research on such new interventions is still in its infancy, with few proof-of-concept

RCTs conducted on a small number of participants, without comparisons with standard treatments. For example, the efficacy of rt-fMRI neurofeedback in a sample of ADHD adolescents was investigated in an RCT (Alegria et al., 2017). Youth in the experimental group received rt-fMRI neurofeedback of the right inferior prefrontal cortex (one region affected in ADHD), whereas participants in the control group received active placebo (rt-fMRI neurofeedback of the left parahippocampal gyrus). Results indicated that both groups evidenced significant improvements in symptoms; however, only the experimental group proved transfer effects and brain changes that correlated with symptom improvement. Another RCT on rt-fMRI neurofeedback was conducted with a sample of adults with ADHD (Zilverstand et al., 2017). Participants in the experimental group learned to regulate the activation of the dorsal anterior cingulate cortex (dACC) based on the feedback they received regarding their activation level of dACC during a mental calculation task, whereas participants in the control group performed the task without any feedback. Results of this study showed similar activation increases in dACC; however, participants in the rt-fMRI neurofeedback condition had superior performance on cognitive functioning (sustained attention, working memory). In conclusion, additional research is needed in order to establish the evidence-based status of neurofeedback interventions for ADHD.

16.2.4.4 Mindfulness-based interventions

Mindfulness-based interventions are part of a "third wave" or "third generation" of CBT (Hayes, Follette, & Linehan, 2004; Hayes, Luoma, Bond, Masuda, & Lillis, 2006). They often involve meditation training, which is based on Buddhist tradition and Western psychology, in which awareness of the present moment and nonjudgmental observation are increased and automatic responding is reduced (Kabat-Zinn, 2003). The proposed mechanisms of change in mindfulness training are body awareness, the enhancement of attention regulation involving processes relating to executive functions (Hölzel et al., 2011; Keng, Smoski, & Robins, 2011) and emotion regulation (Shapiro, Carlson, Astin, & Freedman, 2006), and change in perspective on the self (for a detailed presentation of the proposed mechanisms, see Hölzel et al., 2011).

In terms of the treatment package, we refer to several randomized trials and meta-analyses regarding the efficacy of mindfulness for ADHD.

16.2.4.4.1 Absolute efficacy

An RCT conducted with college students with ADHD compared the efficacy of a mindfulness-based cognitive therapy with waitlist control. The researchers found that mindfulness was superior in terms of ADHD total symptoms, inattention, and hyperactivity, as well as anxiety and mindful attention and awareness (Gu, Xu, & Zhu, 2016). Schoenberg et al. (2014) compared a mindfulness intervention for ADHD adults (aged 18–65) with waitlist and found that mindfulness was *better than waitlist*, as it was associated with reduced hyperactivity/impulsivity and inattention, as well as improvements in mindfulness and quality of life. In a pilot trial comparing mindfulness with waitlist in adult patients (aged 18–50) with ADHD stratified by medication (Mitchell, McIntyre et al., 2013), ADHD symptoms and executive functions improved on both self- and clinician assessments, whereas emotion dysregulation improved for the treatment group (self-assessment only) over time with a large effect (*better than waitlist*).

16.2.4.4.2   Relative efficiency

An RCT comparing mindfulness with methylphenidate is currently being conducted in the Netherlands; however, results are not yet available (Meppelink, de Bruin, & Bögels, 2016).

16.2.4.4.3   Specific efficiency

The first criterion, involving superiority to placebo or equivalence to other standard therapies, is not met (see Section 16.2.4.4.2). Based on the data presented, we conclude that there are *preliminary data*.

The second criterion, regarding the empirical support for the underlying theory for specific mechanisms of change in the case of the therapeutic package, is not met, as we were not able to find either mediation/moderation analyses from complex controlled trials investigating mechanisms of change or component analyses. Data from an RCT comparing mindfulness with waitlist in a sample of adults with ADHD indicated that a significant partial mediator in the relationship between mindfulness efficacy and outcomes (ADHD symptoms, executive functioning) is mindful awareness (Hepark et al., 2015). Furthermore, correlational studies show that ADHD symptoms are negatively associated with self-reported mindfulness (Keith, Blackwood, Mathew, & Lecci, 2016; Smalley et al., 2009). Changes in parenting behaviors following mindfulness could be another mechanisms of change of mindfulness for ADHD children, as there is evidence from experimental studies reporting that, after mindful parenting (Haydicky, Shecter, Wiener, & Ducharme, 2015), parental mindful awareness (Van der Oord, Bögels, & Peijnenburg, 2012) increased. Additionally, preliminary data exist on the associated neuronal mechanisms of mindfulness (Schoenberg et al., 2014; Tang, Hölzel, & Posner, 2015). We conclude that there are *preliminary data* regarding mechanisms of change associated with mindfulness interventions, and future rigorous studies should clarify the validity of these proposed mechanisms of change.

16.2.5   Categories V, VI, VII, VIII, and IX

Categories V, VI, VII, VIII, and IX are constituted by good-intervention- and bad-theory-driven psychotherapies (Category V), good-theory- and bad-intervention-driven psychotherapies (Category VI), bad-theory-driven psychotherapies (Category VII), bad-intervention-driven psychotherapies (Category VIII), and bad-theory- and bad-intervention-driven psychotherapies (Category IX). The common factor for all of these categories is that each requires data invalidating (*strong contradictory evidence*) either the therapeutic package or the underlying theory based on two rigorous trials conducted by at least two different investigating teams. We were not able to identify any ADHD studies in these categories.

However, in the absence of empirical data, any claims regarding the validity of a psychotherapeutical approach should be stated cautiously. For example, let us consider the case of psychodynamic therapies. There are two main perspectives regarding the psychoanalytic conceptualizations of ADHD diagnosis: ego psychology and object relations. According to the first perspective, ADHD symptoms in children indicate the ego's difficulties in abilities such as synthesizing, organizing, and integrating experiences (Gilmore, 2000). According to the second perspective, ADHD symptoms result from

difficulties in interacting with others. Through the transference occurring in the therapeutic relationship, the therapist may intervene at the level of the child's object relations, which, in turn, leads to therapeutic change (Cione, Coleburn, Fertuck, & Fraenkel, 2011). Self-regulatory capacities develop when the patient applies the experiences learned in therapy to daily experiences and relationships with others (Leuzinger-Bohleber et al., 2011). We were only able to find case studies and one larger prevention and intervention study for ADHD based on this perspective. We identified no RCTs that tested the therapeutic package or the underlying theory. Therefore, in the absence of RCTs investigating the efficacy of both the therapeutic package and the underlying theory, we cannot assume that this type of psychotherapy is either efficacious or not. We can only say that there is no evidence for classifying it into one of the nine categories proposed by David and Montgomery (2011).

16.3 Conclusions and Discussion

16.3.1 Implications for Research

According to David and Montgomery's (2011) evaluative framework, current treatments for ADHD fall into four main categories: Category I (evidence-based psychotherapies), Category II (intervention-driven psychotherapies), Category III (theory-driven psychotherapies), and Category IV (investigational psychotherapies). Importantly, we were not able to identify strong contradictory evidence. Even though we found equivocal data (preliminary or mixed findings) for most of the therapeutic packages, no study investigated possible harmful effects. Consequently, as this chapter did not aim to investigate ADHD interventions exhaustively, pseudoscientific approaches to ADHD treatment could exist, but we might not have identified them as such.

   Our classification of ADHD evidence-based psychotherapies (David & Montgomery, 2011) differs from current guidelines and suggests that far more research is needed in order to establish evidence-based psychotherapies for ADHD. Let us consider the case of behavioral parent training, currently recommended by NICE guidelines as an evidence-based psychotherapy for a child with ADHD. According to David and Montgomery's classification system, this intervention falls in Category III (theory-driven psychotherapies), which means that it has a well-supported theory and an insufficiently tested treatment package. Due to mixed data regarding its equivalence or superiority to standard treatment as a function of unblinded versus blinded assessors' ratings (e.g., parents, teachers, or clinicians), further research is necessary to control for possible biases. By testing these biases in RCTs, ADHD interventions could move from one category to another, either in the direction of scientifically oriented psychotherapies (if there is evidence for a well-supported treatment package or theory) or to pseudoscientifically oriented psychotherapies (if there is strong contradictory evidence showing absence of benefit or evidence of harm). Research should also bring evidence regarding the maintenance of gains after treatment (e.g., consider the scarcity of studies that investigated the long-term effects of neurofeedback interventions) and investigate not only the clinical efficacy of an available treatment option but also its cost-efficiency.

16.3.2 Implications for Practice

ADHD is a prevalent and debilitating condition that calls for more research on evidence-supported treatments. In the past decade, there has been an explosion of cognitive training interventions (e.g., Cogmed, Lumosity, Mindsparke, Jungle Memory) promising evidence-based training associated with outcomes such as intelligence, creativity, academic improvement, and improved attention. Further investigation of their underlying theory and treatment package could prevent the large-scale dissemination of pseudoscientific interventions. In addition to nonclinical implications of psychotherapeutic interventions, the development of interventions that target both core symptoms of ADHD and the functional impairments associated with this condition could have major implications for clinical practice. Given the resources that patients and their families invest in treatment (costs, time), it is highly important to offer in practice the best treatment options according to the existent research, which have also proved to be cost-efficient.

In conclusion, it is highly important to investigate both the therapeutic package and its active ingredients in future RCTs in order to establish the evidence-based status of ADHD psychotherapies. Only after rigorous testing of both components instrumental to psychotherapy should the findings be incorporated into clinical guidelines.

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