

Nonpharmacological Interventions for Preschoolers With ADHD

The Case for Specialized Parent Training

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The past decade witnessed an increased use of stimulants for the treatment of attention-deficit/hyperactivity disorder (ADHD) in preschool children. However, the reluctance of parents of preschoolers to place their young children on stimulants (S. H. Kollins, 2004) coupled with the paucity of information regarding the long-term effects of stimulants in preschoolers makes the development and testing of nonpharmacological treatments for preschoolers with ADHD a major public health priority. This article addresses this issue. First, we highlight issues relating to the existence of ADHD in preschoolers as a clinically significant condition and the need for effective treatment. Second, we examine issues related to the use of pharmacological therapies in this age group in terms of efficacy, side effects, and acceptability. Third, we discuss existing nonpharmacological interventions for preschoolers and highlight the potential value of parent training in particular. Finally, we introduce one candidate intervention, the New Forest Parenting Package, and present initial evidence for its clinical value as well as data on potential barriers and limitations.

Key words: *attention-deficit/hyperactivity disorder, behavior modification, preschoolers, psychosocial treatments*

ATENTION-DEFICIT / HYPERACTIVITY DISORDER (ADHD) is a chronic condition, associated with impairments in multiple domains and long-term educational and vocational disadvantage, social exclusion, delinquency, and substance abuse (Swanson et al., 1998). The ADHD diagnosis is most commonly made when children reach middle childhood (around 7 years), but onset is typically during the preschool years. Recently,

there has been an increase in the diagnosis of ADHD among preschool children (ie, younger than 5 years), as well as a 3-fold increase in prescriptions for psychopharmacological treatment in preschoolers (Zito et al., 2000). This trend has occurred despite uncertainties about efficacy, short- and long-term side effects, and general misgivings about treating very young children with psychotropic medications (Volkow & Insel 2003; Zito et al., 2000). This situation is likely due, in part, to the lack of efficacious nonpharmacological alternatives for use as frontline therapies for ADHD in general, and especially in the preschool period. This article addresses the current state of affairs regarding interventions for treating preschool ADHD by assessing the veracity of 4 basic propositions relating to preschool ADHD and its treatment. These propositions are that (i) preschool

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ADHD is a valid disorder that is associated with significant impairment and burden for the family; (ii) preschool ADHD is a risk factor for later serious psychopathology; (iii) pharmacotherapies commonly used with older children are regarded as unacceptable for young children by parents and clinicians; and (iv) initial evidence supports the efficacy of a nonpharmacological therapy, the New Forest Parenting Package (NFPP), as a candidate frontline treatment for preschool ADHD.

PRESCHOOL ADHD: SYMPTOM STRUCTURE, CLINICAL SIGNIFICANCE, AND DEVELOPMENTAL RISK

ADHD among school-aged children has clinical and scientific utility (Sonuga-Barke et al., 2004). Symptoms of impulsivity, hyperactivity, and inattention cluster together, are associated with significant impairment, and can be distinguished from other conditions (Burns, Walsh, Owen, & Snell, 1997; Hinshaw, 2002; Sonuga-Barke, 1998; Tannock, 1998). A growing literature supports the validity of preschool ADHD as a disorder dimension by suggesting that the symptom structure, patterns of associated deficits, impairment, and neuropsychological characteristics are common to school-aged and preschool-aged children with ADHD (Sonuga-Barke, Dalen, & Ramington, 2003). This view is supported by factor analytic studies of large population-based samples of children (Fantuzzo et al., 2001; Pavuluri & Luk, 1998; Sonuga-Barke, Thompson, Stevenson, & Viney, 1997), and analyses of the internal consistency and clinical validity of preschool ADHD rating scales (Gadow & Nolan, 2002; Miller, Koplewicz, & Klein, 1997). There is evidence that subtypes of ADHD in preschoolers map on to their school-aged equivalents (Lahey et al., 1998). Patterns of comorbidity associated with preschool ADHD (particularly with conduct problems) parallel those observed in older children (Wilens et al., 2002). The clinical significance of preschool ADHD is demonstrated by its association with marked impairment

across a number of domains. First, there is a consistent association with mild intellectual and language impairment, and poor preacademic skills (Gadow & Nolan, 2002; Shelton et al., 1998; Sonuga-Barke, Lamparelli, Stevenson, Thompson, & Henry, 1994). Second, preschool children with ADHD have more motor coordination problems and have more accidents than do their non-ADHD peers (Lahey et al., 1998). Third, young children with ADHD have deficits in social skills, especially in social cooperation (Merrell & Wolfe, 1998) and friendships (Lahey et al., 1998). They also experience problematic interactions with their parents and other relatives (Daley, Sonuga-Barke, & Thompson, 2003; DuPaul, McGoey, Eckert, & VanBrakle, 2001), which contribute to high levels of familial stress, which, in turn, exacerbate mental health problems among family members (DeWolfe, Byrne, & Bawden, 2000). Clinical diagnostic descriptors and thresholds may need to be refined in the future to take account of the context and demands of the preschool period (Brotman & Gouley, in press). However, existing data generally support the use of *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.) (*DSM-IV*) criteria for diagnosis in this age group (Ghuman, 2004; Lahey et al., 1994, 2004).

Longitudinal studies of transition from preschool to school suggest that ADHD is relatively stable (Lavigne et al., 1998; Mathiesen & Sanson, 2000; Sonuga-Barke et al., 1997). In high-risk and clinical samples, persistence is particularly marked (Campbell, Pierce, March, Ewing, & Szumowski, 1994; Lavigne et al., 1998; Marakovitz & Campbell, 1998). The persistence of ADHD in 4-6-year-olds ($N = 255$) who met rigorous diagnostic and impairment criteria has been reported (Lahey et al., 2004). Over the ensuing 3 years, nearly all continued to meet full diagnostic criteria for ADHD and to display cross-situational impairment. As early as age 3, severity of ADHD is the most significant indicator of chronicity into middle childhood. ADHD severity in preschoolers also predicts the emergence of oppositional defiant disorder

(ODD). The combination of ODD and ADHD predicts the persistence of both disorders into middle childhood (Campbell et al., 1994; DuPaul et al., 2001; Keenan & Wakschlag, 2000; Speltz, McClellan, DeKlyen, & Jones, 1999). This most likely reflects an interaction of a genetically based predisposition toward poor regulation of affect and impulses (Arseneault et al., 2003; Caspi, Henry, McGee, Moffitt, & Silva, 1995) and the social environment. Negative parenting (coercive, overstimulating, intrusive, and restrictive) expressed from the first year of life onwards is linked to both homotypic (continuation of ADHD) and heterotypic continuity (emergence of other problems; Jacobvitz & Sroufe, 1987; Morrell & Murray, 2003; Olson, Bates, & Bayles, 1990; Olson, Bates, Sandy, & Schilling, 2002). Such findings are typically interpreted as resulting from reciprocal parent-child effects: toddlers who are negative, poorly regulated, and challenging for parents elicit a negative response from parents. In turn, these negative responses maintain children's early defiant and impulsive behavior. This view is consistent with a growing literature that reports that the combination of child negativity and harsh parenting is associated with increases in externalizing behavior problems in young children (Bates, Dodge, Pettit, & Ridge, 1998; Belsky, 1999; Belsky, Hsieh, & Crnic, 1998; Brook, Tseng, & Cohen, 1996; DeKlyen, Speltz, & Greenberg, 1998; MacKinnon-Lewis, Starnes, Volling, & Johnson, 1997; O'Leary, Slep, & Reid, 1999; Rubin, Burgess, Dwyer, & Hastings, 2003; Smith, Calkins, Keane, Anastopoulos, & Shelton, 2004). This pattern suggests that positive and constructive parenting, in the face of challenging child behavior, has the potential to prevent negative child outcomes. This transactional model underscores the importance of socialization processes in either helping young children overcome their difficulties or exacerbating problems by fuelling anger, noncompliance, and poor impulse control (Bates et al., 1998; Belsky et al., 1998; Campbell, 2002; Kochanska, 1997). *In summary, preschool ADHD causes significant impairment for the child and burden for the family. It repre-*

sents an early manifestation of school-aged ADHD and a significant risk factor for the emergence of other impairing conditions. For these reasons, preschool ADHD represents an important intervention target.

PSYCHOSTIMULANT TREATMENT OF PRESCHOOL ADHD

Efficacy

For school-aged children with ADHD, psychostimulant medication is the treatment of choice. Stimulants effectively control symptoms and reduce associated impairment in 75% to 80% of children (Daley, 2004). In the Multimodal Treatment of ADHD study (MTA), medication was superior in reducing ADHD symptoms when compared to an intensive psychosocial intervention and a community care control group (MTA Cooperative Group, 1999). A small number of studies have reported efficacy of psychostimulants in preschool ADHD; these have varied in design, quality, and size. Few published trials have included children younger than 4. Most placebo-controlled trials report beneficial effects in terms of symptom control as well as reductions in impairment. Barkley (1988) reported that stimulants improve the quality of interactions between preschoolers and their mothers. Monteiro-Musten, Firestone, Pisterman, Bennett, and Mercer (1997) found that stimulants increased preschoolers' attention, decreased impulsiveness, and improved adjustment but not compliance with parental requests. Byrne, Bawden, DeWolfe, and Beattie (1998) reported that stimulants improved behavior and significantly reduced errors of omission on visual and auditory vigilance tests. Short, Manos, Findling, and Schubel (2004) found a clinically significant reduction (≥ 1 SD) in ADHD symptoms in 82% ($N = 28$) of preschoolers treated with stimulants. Initial results from the large-scale multisite Preschool ADHD Treatment Study (PATS; Greenhill, 2004) indicate that methylphenidate is efficacious in reducing ADHD and ODD symptoms (Kollins, 2004). There are currently no data on the longer

term benefits in preschool-aged children. While most recent studies suggest that methylphenidate is relatively well-tolerated by young children, some suggest that side effects might be more marked in preschoolers than in school-aged children (Firestone, Musten, Pisterman, Mercer, & Bennett, 1998). Furthermore, some researchers have argued that there is the potential for negative long-term effects on the developing brains of young children chronically medicated (Moll, Rothenberger, Ruther, & Huther, 2002).

Acceptance by parents and clinicians

While the value of stimulant medication for the treatment of ADHD in school-aged children is well established, there is a substantial minority of parents and clinicians who have reservations about its use (Rushton, Fant, & Clark, 2004). Fifty-five percent of parents whose school-aged children take medication reported initial hesitation due to concerns over side effects and negative press reports (DosReis et al., 2003). In the NY/Montreal multimodal treatment study of 7–9-year-old children with ADHD, 25% of parents who inquired about the study indicated an unwillingness to consider medication treatment for their child. Moreover, an additional 12% who consented to participate did not because of antim medication attitudes (Klein, Abikoff, Hechtman, & Weiss, 2004). No systematic analysis has been published on parent and clinician attitudes toward the use of stimulants for ADHD in preschoolers. Clinical reports, however, suggest that the younger the child the greater the resistance. In the PATS study of methylphenidate, a substantial proportion of potential cases could not be included because of strong antim medication concerns. Reasons included unknown long-term effects of stimulant treatment in preschoolers, and a desire for nonpharmacological treatment.

In summary, available data suggest that preschoolers with ADHD can be successfully treated with psychostimulant medication but the public's concerns over its use mean that many parents and clinicians will not use psychostimulants for preschool ADHD.

Thus, although preschool ADHD is a serious condition that often persists into middle childhood and is a risk for other disorders, use of effective treatments is likely to be limited by concerns about stimulant medication in young children.

NONPHARMACOLOGICAL THERAPIES FOR PRESCHOOL CHILDREN WITH ADHD

In view of the above, the development of effective nonpharmacological therapies for treating preschool ADHD represents a major public health priority. The use of psychosocial approaches for the treatment of ADHD has a long history, and there are some data from controlled trials demonstrating their potential to reduce ADHD symptoms (Pelham, Wheeler, & Chronis, 1998). However, most trials report minimal effects on core symptoms (reviewed in Hinshaw, Klein, & Abikoff, 1998, 2002; McGoey, Eckert, & Dupaul, 2002). Consequently, psychosocial approaches are currently not recommended as stand-alone, front-line treatments for ADHD (American Academy of Child & Adolescent Psychiatry, 1997; American Academy of Pediatrics, 2000). Instead, they are considered as a component in a multimodal strategy that targets the broader range of behavioral and emotional problems that frequently accompany the disorder.

Two characteristics of current standard psychosocial approaches (SPAs) might explain their limited impact on ADHD. First, SPAs use techniques based upon generic theories of behavior management developed out of operant and social learning theory. In these models, parents and teachers are taught ways to manage the overt oppositional behavior associated with ADHD through the setting of rules and the effective management of contingencies (rewards and punishments) (Barkley et al., 2000). Although these types of interventions are highly effective in the treatment and prevention of conduct problems (Kazdin & Wassell, 2000; Wasserman & Miller, 1998), they do not target the putative dysfunctions underlying ADHD. Neither have they addressed the sociodevelopmental

processes (mediated by the quality of parent-child interaction in creating so-called zones of proximal development and scaffolding the development of attentional skills) that play an important role in promoting psychological development in the relevant domains of attention, impulse control, and self-organization during early childhood (Crandell & Hobson, 1999; Puckering, Pickles, Skuse, & Heptinstall, 1995). Second, SPAs for the treatment of ADHD are often introduced relatively late, during middle childhood, after school entry, when the impact of ADHD has almost invariably become complicated and compounded by school failure and behavior problems and associated low self-esteem (Slomkowski, Klein, & Mannuzza, 1995), as well as a hardening of parental and teacher attitudes to children with ADHD. Consequently, ADHD may be intrinsically more difficult to treat using nonpharmacological means in middle childhood than it is in the preschool period.

A number of parenting programs have been shown to reduce conduct problems (not ADHD) in 2-5-year-old children (Parent-Child Interaction Therapy [Eyberg, Boggs, & Algina, 1995]; Incredible Years [Webster-Stratton, Reid, & Hammond, 2004]; Helping the Noncompliant Child [Forehand & McMahon, 1981]). Recently, it has been shown that SPAs are equally effective when used with 4-7-year-old children with conduct problems with or without attentional problems (Hartman, Stage, & Webster-Stratton, 2003). In nonclinical groups of preschoolers with behavior problems, parent training has resulted in significant reductions in oppositional behavior and improvements in parent-rated attention (Bor, Sanders, & Markie-Dadds, 2002; Strayhorn & Weidman, 1989). However, evaluation of changes in school behavior to assess generalization across settings was not done (Bor et al., 2002), or was not significant (Strayhorn & Weidman, 1989). Notably, these studies provide little evidence that SPAs represent an effective treatment for preschool ADHD *per se*. Barkley et al. (2000) evaluated a comprehensive group intervention format

for parents from a community-derived sample of disruptive preschoolers with high levels of hyperactive, impulsive, and inattentive behavior. Parent training did not result in significant treatment effects. Problematically, attendance was limited; fewer than half the families attended at least 50% of sessions, and nearly a third did not attend any session at all. In randomized trials with clinical samples of children with ADHD, tailored combinations of parenting and family intervention for school-aged children (Hoath & Sanders, 2002) or parent training contingency management approaches that target noncompliance and disruptive behaviors in preschoolers with ADHD (Pisterman et al., 1989, 1992) have not reduced ADHD symptoms.

THE NEW FOREST PARENTING PACKAGE

The NFPP is a specialized ADHD psychosocial intervention that builds on the approaches used in preschool SPAs by combining behavior management techniques with a novel therapeutic component targeted directly at those parent-child processes thought to play a mediating role in the development of attentional and self-organizing skills. This model is based on the developmental literature relating to the important role played by constructive and reciprocal parent-child interactions during the preschool years in the psychological development of attention and impulse control. In particular, children of parents who engage in reciprocal, sensitive, and positive interactions, and effectively scaffold and motivate their child's attention and self-organization, display a developmental advantage over children of parents who do not (Connell & Prinz, 2002; Wacharasin, Barnard, & Spieker, 2003). Specifically, parents need to be supportive, aware of the child's developmental level, and set appropriate and challenging goals (Gauvain & Fagot, 1995). Key treatment goals in NFPP include (i) the reduction of parental negative reactions; (ii) the promotion of appropriate limit setting as a basis for authoritative parenting; (iii) an increase in both the quality

and quantity of positive and constructive interaction between the parent and the child; and (iv) tailored motivation and scaffolding of attention and self-organizational competencies. Figure 1 presents a schematic description of the structure of the NFPP as it is currently formulated in terms of its goals and specific treatment targets and the week-by-week setting for training.

We have compared the efficacy of a version of this package when delivered as an 8-week home-based intervention. Seventy-eight 3-year-old children identified from a general population of more than 3000 children who met modified criteria for ADHD entered the study. These children were randomly assigned to 1 of 3 conditions: parent training ($n = 30$), an active parent counselling and support control condition ($n = 28$) or a wait-list control ($n = 20$). Both treatments were delivered over 8 weeks with weekly 1-hour sessions in the family home. Treatment was delivered by skilled specialist nurse-therapists. They had extensive experience of working with families of young children with ADHD. Parent training focused on the management of ADHD symptoms and the promotion of improved attention and self-regulation. The control condition excluded any focus on management or parenting skills, and consisted of nonspecific support. Treatment integrity as rated by independent observers was very high (96% correct designation of treatment sessions). Measures were obtained at baseline, immediately post-treatment, and at 15 weeks follow-up. Objective measures were conducted in the homes by a researcher blind to treatment condition. Based on an intention to treat design, analyses of covariances indicated a main effect of treatment on ADHD symptoms and maternal well-being ($F_s > 10.30$; $P < .001$). The NFPP was superior to the wait-list control ($F_s > 17.00$; $P < .001$) and active attention control condition ($F_s > 8.40$; $P < .01$) on both indices. The effect sizes for NFPP impact on ADHD against wait-list control were 0.87 (parent reports) and 0.43 for direct observations of attention. Fifty-three percent of children receiving the NFPP showed normal-

ized behavior after treatment as compared to 25% of those in the wait-list control group ($P < .05$).

Following the positive results obtained in the first study, the next investigation tested whether similar positive results were obtainable with the NFPP when delivered by non-specialist nurses given brief training (Sonuga-Barke, Thompson, Daley, & Laver-Bradbury, in press). Using a protocol identical to that previously used, 69 children out of 3409 screened participated, with 59 randomized to parent training and 10 to a wait-list control group. Program content of parent training was identical to that used in the first trial, but program delivery and training of interventionists differed. In this trial, the program was delivered by 16 nonspecialist nurses randomly selected from a large pool. Training consisted of a 2^{1/2} day in-service course. Unlike the first trial, there was no significant improvement in ADHD symptoms with the NFPP. A qualitative analysis suggested that children treated by nurses with experience working with preschoolers with ADHD had better outcomes. However, the study was not powered to assess therapist effects. Also, the small n in the control group may have limited power.

Secondary analysis of data from the 2 trials was undertaken to identify parent and child characteristics that might predict effectiveness of the NFPP (Sonuga-Barke, Daley, & Thompson, 2002). On the basis of the clinical observation that adults with ADHD often experience difficulties in parenting, we focused on the status of parental symptoms of ADHD as a potential barrier to treatment (Weiss, Hechtman, & Weiss, 2000). It has been suggested that parental inconsistency and reactivity (perhaps driven by impulsiveness) and organizational and planning difficulties (perhaps driven by inattention) result in an inconsistent and disorganized parenting style, exacerbating children's problems (Sonuga-Barke, Daley, Thompson, Laver-Bradbury, & Weeks, 2001) and presenting a significant barrier to effective management of a child with ADHD (Evans, Vallano, & Pelham, 1994). Mothers' scores on the adult AD/HD Rating Scale

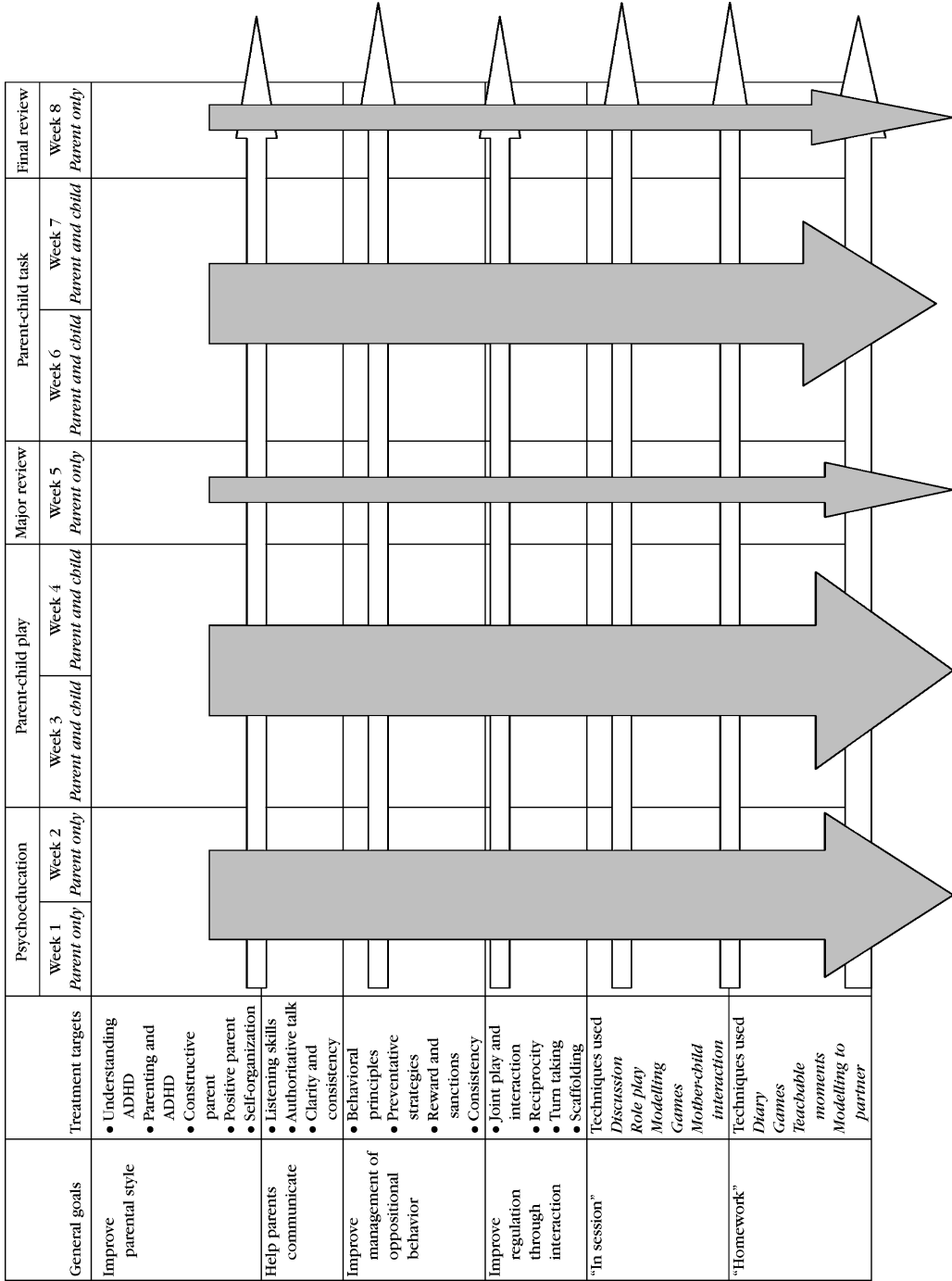


Figure 1. A schematic presentation of the structure of the New Forest Parenting Package. ADHD indicates attention-deficit/hyperactivity disorder.

(AARS; Barkley & Murphy, 1998) in the 2 trials were trichotomized. A comparison of NFPP efficacy across these 3 groups showed that while children in the low maternal ADHD group displayed a marked and statistically significant reduction of ADHD symptoms following the NFPP, those in the high ADHD group showed little or no change (parental ADHD Group by Time interaction term: $F_{4,160} = 3.13$; $P < .05$). These effects remained even when other parent and child factors, such as maternal health, parenting satisfaction, and efficacy, and baseline levels of child behavior problems (other than ADHD) were controlled. Additional support for the influence of maternal ADHD on parent intervention outcomes comes from a recent study indicating that parent training is relatively less effective in children with ADHD with parents with elevated ADHD scale scores (Harvey et al., 2003).

In summary, when delivered by experienced and specialist therapists, the NFPP leads to clinically significant reductions in ADHD symptoms and improvements in maternal well-being. The effects on ADHD were clinically meaningful and in the range of those shown with stimulants in preschoolers. These effects were maintained at 15 weeks follow-up. This study provides the best evi-

dence to date of the potential of parent-based interventions to reduce ADHD symptoms in preschool children with an ADHD equivalent. Parental ADHD symptoms appear to be a significant barrier to the implementation of the package.

IN CONCLUSION

Preschool ADHD presents a major target for clinical intervention. Although pharmacological interventions are potentially efficacious, there is controversy around their use in young children. Effective nonpharmacological interventions are required to provide alternative treatment options for parents and clinicians. The NFPP, which integrates cognitive-behavioral parent management training with parenting skills based on the developmental literature related to attention and regulation, represents one candidate specialist parenting intervention. Initial trial evidence supports the efficacy of the NFPP. Further studies are required to (1) replicate findings, particularly with preschoolers systematically diagnosed with ADHD according to DSM-IV criteria; (2) demonstrate maintenance over time; and (3) show generalization to school and peer group settings.

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