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A Pilot Trial of Supporting teens' Academic Needs Daily (STAND): A Parent-Adolescent Collaborative Intervention for ADHD

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Abstract Behavior therapy is one of two evidence-based treatments for ADHD—the other being stimulant medication. However, there are only a handful of studies of behavioral treatment for ADHD in adolescents (Smith et al. Clinical Child and Family Psychology Review 3:243–267, 2000). Supporting Teens' Academic Needs Daily (STAND) is a parent-adolescent collaborative behavioral intervention for adolescents with ADHD that can be delivered in clinic, school, and community settings. This pilot study evaluates the feasibility, acceptability, and preliminary efficacy of STAND. Thirty-six male and female middle school students with ADHD and diverse ethnic backgrounds were randomly assigned to STAND or a Treatment as Usual (TAU) control group. Participants were evaluated at baseline, mid-treatment, and post-treatment assessments. Results suggest that STAND can be implemented by even beginner therapists with high treatment fidelity and is accessible to and popular with families. Relative to the TAU group, participants who received STAND showed greater improvements in parent-rated and observed academic and symptom indices. Treatment effects were not present for teacher ratings. Although the STAND group made significant gains in GPA (compared to TAU), these gains were small in size (d = .25). The future of STAND as an academic intervention for adolescents with ADHD is discussed, as well as general implications for behavioral treatment delivery to ADHD adolescents.

Keywords ADHD · Adolescents · Behavioral treatment · Families

It is well-accepted that ADHD persists into or even worsens in adolescence (Molina et al. 2009; Wolraich et al. 2005). Adolescents with ADHD experience impairment in many domains, including academic impairments, delinquency, substance use, and interpersonal problems (Bagwell et al. 2001; Barkley et al. 1991; Molina et al. 2007; Sibley et al. 2011d). Of these domains, academic problems may be among the most concerning as they are a major risk factor for other serious outcomes (e.g., Substance Use Disorders, delinquency; Bryant et al. 2003). The academic problems of adolescents with ADHD include risk for class failure, poor work completion, lower class placement, and school drop-out (Barkley et al. 1991; Kent et al. 2011). Therefore, intervention strategies for adolescents with ADHD should target these domains to mitigate risk for serious long-term problems.

Middle school may be an especially critical intervention period for adolescents with ADHD, as it marks the secondary school transition. Middle school demands greater independence and executive functioning skills than elementary school. For the first time, students must manage their schedule and school materials, turn in assignments with minimal prompts, remember homework given by multiple teachers, and plan long-term projects (Eccles 2004). Middle school is

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regarded as a challenging environment even for typically developing youth (Eccles 2004), and there is evidence that adolescents with ADHD are especially prone to difficulties in these years (Langberg et al. 2008; Schultz et al. 2009). Therefore, developing mastery of organization and academic skills in middle school may be a key strategy to improve secondary school academic outcomes for adolescents with ADHD.

Despite the poor outcomes highlighted above, almost no empirically supported treatments are available for the academic problems of adolescents with ADHD. Behavior therapy and stimulant medication are the two evidence-based treatments for ADHD in children (Fabiano et al. 2009). Stimulant medication can acutely improve academic functioning in adolescents (Evans et al. 2001) and is the recommended first-line treatment for adolescents with ADHD (AACAP2007; American Academy of Pediatrics 2011). However, most teens eventually refuse use of stimulant medication (Biswas et al. 2009; Molina et al. 2009) and there is almost no evidence that stimulants improve long-term academic outcomes (Langberg and Becker 2013; Loe and Feldman 2007; Molina et al. 2009). Therefore, medication is an insufficient treatment for most ADHD teens.

There are very few studies of behavior therapy for adolescents with ADHD and school-related impairment (Pelham and Fabiano 2008; Smith et al. 2000). Most evaluate interventions that are intensive and designed for students with very severe academic deficits. For example, the Summer Treatment Program-Adolescent (STP-A) is an 8-week intensive behavioral day treatment program that shows evidence of improving academics and classroom behavior in adolescents with ADHD (Evans et al. 1994; Sibley et al. 2011c). Behavior therapy delivered in after-school programs (e.g., Challenging Horizon's Program, Evans et al. 2011) also produces improvements in parent and teacher ratings of academic functioning. The intensity of these approaches (10 to 40 h per week of direct treatment) demands substantial staff and financial resources. As a result, it is not cost-effective to deliver intensive programs to all middle school students with ADHD.

Historically, standard (non-intensive) behavioral interventions for ADHD are delivered by school staff. Elementary school teachers implement interventions for ADHD widely and effectively (i.e., classroom behavior management system, school daily report card; Fabiano et al. 2002; Pelham and Fabiano 2008). However, the culture of secondary schools appears prohibitive of school-based intervention delivery, despite evidence that middle school staff can do so effectively (Langberg et al. 2012). Namely, middle school teachers instruct over 100 students each day (compared to 20 in elementary school) and subsequently, cannot offer as much personal support to students (Eccles 2004). For example, national survey data suggests that less than a third of middle school teachers report using classroom interventions with students who have ADHD (Fabiano et al. 2002). Evans et al. (2007) trained middle school support staff to deliver behavioral interventions to students with ADHD. Overwhelmingly, school employees: (1) were unwilling to implement suggested interventions, (2) did not adjust interventions according to consultant feedback, and (3) failed to abide by treatment manual procedures. These data suggest that standard behavioral interventions are difficult to directly deliver in secondary schools.

When school staff fail to deliver standard behavioral interventions to middle school students with ADHD, it may be particularly detrimental to long-term academic outcomes. Namely, intervention delivery diminishes at a time when adolescents with ADHD are at highest risk for deterioration of functioning (Langberg et al. 2008). Students with ADHD likely need increased behavioral support to successfully transition to secondary school. Therefore, if school staff will not reliably deliver standard intensity behavioral interventions, an alternative method of treatment delivery must be identified.

One unutilized alternative to school-based intervention delivery may be a parent-coordinated behavioral intervention. Parental involvement in schooling can boost academic motivation and achievement (Dearing et al. 2006; DeBaryshe et al. 1993; Hill and Tyson 2009) and enhance behavioral treatment (Barkley et al. 2001; Stormshak et al. 2005). Under this approach, adolescents learn new skills and parents create a structured home environment that rewards skills use. Such an intervention could be briefer and more cost-effective than intensive behavior therapy and relieve the burden of intervention delivery from secondary school staff. Parent coordinated interventions for elementary school children with ADHD— primarily in the form of a school-home daily report card or structured homework intervention— are effective and widely implemented (Fabiano et al. 2009; Jenson et al. 1994; Pelham and Fabiano 2008; Power et al. 2012); yet, there is almost no work documenting that parents can play an effective role in academic interventions for adolescents with ADHD (Raggi et al. 2009).

We believe that treatment development efforts skirted the parent-adolescent collaborative approach in part due to several factors- some of which are associated with secondary schools in general and some of which are associated with ADHD adolescents in particular. First, communication from teachers is difficult to obtain in middle schools (Evans et al. 2007), impeding parents' ability to monitor academics from home. Second, parents of adolescents with ADHD report elevated levels of caregiver strain (Evans et al. 2009b) and parent-adolescent conflict (Barkley et al. 2001; Edwards et al. 2001), which can decrease parent motivation to implement a home-based academic intervention. Accordingly, high treatment drop-out is reported for the two available studies of parent-based interventions for adolescents with ADHD (e.g., 38 % over 16 weeks; Barkley et al. 2001).

Despite these historic barriers, a return to parent-based treatments for adolescents with ADHD may now be appropriate due to two recent therapeutic and technological advances. For one, the advent and increasingly widespread use of web-based electronic grade books (Lacina 2006) increases a parent's ability to monitor academics from home without the need for direct teacher communication. Second, to enhance parent motivation, a successful parent-coordinated intervention for ADHD may require conjunctive engagement building techniques. A new therapeutic style with strong evidence of engaging challenging clients in treatment rose to prominence during the past decade (Motivational Interviewing (MI); Miller and Rollnick 2013). MI enhances family engagement for adolescents with conduct problems (Dishion and Kavanagh 2003), and may be equally effective as part of an academic intervention for adolescents with ADHD.

In sum, available school-based and intensive behavior therapy models fit poorly with the secondary school environment. To investigate the promise of a parent-based approach, this study evaluates the feasibility and preliminary efficacy of Supporting Teens' Academic Needs Daily (STAND). STAND is a parent-adolescent collaborative behavioral intervention for ADHD that targets academic impairment. The purpose of the STAND model is to relieve the burden of intervention delivery from secondary school staff by teaching parents to implement traditionally school-based interventions. STAND: (1) provides families with brief clinic-based training in academic, organizational, and behavioral parenting skills (e.g., Evans et al. 2011; Barkley et al. 2001) and (2) utilizes a MI framework (Miller and Rollnick 2013) to enhance parent engagement in intervention delivery. Middle school students with ADHD ($N=36$) were randomly assigned to receive STAND ($N=18$) or Treatment as Usual (TAU; $N=18$). We hypothesized that STAND would be feasible to implement and acceptable to families as indicated by strong attendance, treatment fidelity, treatment credibility, therapeutic alliance, family engagement, adherence to intervention components, and parent satisfaction. Additionally, we evaluated the preliminary efficacy of STAND by comparing the groups on indicators of academic functioning, disruptive behavior disorder symptoms, and family functioning. We hypothesized that adolescents who received STAND would display gains in each of these domains, relative to the control group.

Method

Participants

Participants were 36 middle school students with ADHD between the ages of 11–15 in urban South Florida. Participants attended 29 different middle schools: 69.4 % attended public school, 13.9 % charter school, and 16.7 % private school. Participants were required to: (a) meet DSM-IV-TR (American Psychiatric Association 2000) diagnostic criteria for ADHD, (b) be enrolled in the sixth, seventh, or eighth grade, (c) have an estimated IQ of 80 or higher, and (d) have no history of an autism spectrum disorder. Placement in a self-contained special education classroom was exclusionary. Participants were randomly assigned to receive STAND or TAU. The groups were matched on medication status and single parent household using a stratified randomization procedure. Demographic and diagnostic characteristics of each group are listed in Table 1. There were no significant group differences on any variables ($p>.20$).

Procedures

Participants were recruited through direct school mailings, word of mouth, and advertisements at local community health fairs. For all potential participants, the parent who primarily is involved with academics was administered a brief phone screen containing the DSM-IV-TR ADHD symptoms and questions about academic functioning. Families were invited to an intake assessment if the parent endorsed on the phone screen: (1) four or more symptoms of either Inattention or Hyperactivity/Impulsivity (APA 2000) and (2) clinically significant academic problems (at least a "3" on a "0 to 6" impairment scale). Eight six families completed a phone screen, with 63 families invited to attend an intake assessment. Forty-three families attended the intake appointment (20 families failed to attend the intake appointment).

At an intake assessment, informed parental consent and youth assent were obtained. The parent who said they were primarily involved with academics participated in the assessment and treatment aspects of the project, but when available, other parents were encouraged to provide supplemental information and participate in treatment. During the assessment, ADHD diagnosis was assessed through a combination of parent structured interview (Computerized-Diagnostic Interview Schedule for Children; Shaffer et al. 2000) and parent and teacher rating scales, as is the standard and recommended practice in the field (Pelham et al. 2005). Additionally, the clinician administered a brief intelligence test (Wechsler Abbreviated Scale of Intelligence; Wechsler 1999), achievement testing (Wechsler Individual Achievement Test-II; Wechsler 2002), and parent and adolescent ratings scales and other instruments to assess demographic information, treatment history, the parent-teen relationship, and academic problems. Parents were given teacher symptom and impairment ratings to obtain from at least two core academic teachers. Dual clinician review was used to determine diagnosis and study eligibility. Where disagreement occurred, a third clinician was consulted. Of the 43 participants who attended an

Table 1 Diagnostic and demographic characteristics of the sample at baseline

	Treatment (N=18)	Control (N=18)
Diagnostic variables at baseline		
WASI estimated full-scale IQ	101.94 (11.13)	104.72 (11.16)
WIAT reading achievement	103.94 (10.73)	101.72 (9.74)
WIAT math achievement	94.71 (14.38)	99.61 (15.00)
ADHD		
ADHD-predominantly inattentive (%)	16.7	27.8
ADHD-combined (%)	83.3	72.2
Inattention symptom count (M, SD)	8.67 (.59)	8.78 (.43)
H/I symptom count (M, SD)	7.56 (1.76)	6.61 (2.66)
Oppositional defiant disorder (%)[a]	77.8	77.8
Symptom count (M, SD)	5.28 (2.32)	4.44 (2.38)
Conduct disorder (%)	5.6	16.7
Symptom count (M, SD)	1.56 (1.92)	1.00 (1.57)
Demographic variables		
Age (M, SD)	12.22 (.94)	12.56 (1.10)
Male (%)	77.8	66.7
Race/Ethnicity (%)		
White non-hispanic	27.8	22.2
Black non-hispanic	5.6	11.1
Hispanic any race	66.7	55.6
Mixed race	0.0	11.1
Highest parent education		
High school grad, GED, or less (%)	16.7	22.2
Part college or specialized training (%)	16.7	16.7
College or university grad (%)	44.4	38.9
Graduate professional training (%)	22.2	22.2
Single parent household (%)	22.2	22.2
Medicated for ADHD (%)	38.9	38.9

There were no significant between group differences on any demographic or diagnostic variables (p>.20). Symptom Count is total number of symptoms reported by either parent or teacher on the DBD rating scale or DISC interview. [a]Does not exclude adolescents who also met criteria for CD

intake, 38 met study criteria and five were excluded. Exclusion at intake occurred for the following reasons: low IQ (N=2), self-contained classroom (N=3), and failure to meet impairment criteria (N=1). Thirty-six participants enrolled.

Participants in both groups were permitted to seek or continue additional psychosocial treatments during the study. Participants were required to keep medication status (medicated vs. not medicated) constant during the study. STAND families received the intervention from January–May to address high levels of academic failure that occur for middle school students with ADHD during the spring (Schultz et al. 2009). TAU families were offered low intensity behavioral treatment (STAND-Group; Sibley and Pelham 2011b) after the study ended. Both groups participated in mid-treatment (March) and post-treatment (June) assessments during which direct product measures, and objective, self, teacher, and parent ratings of academic and psychosocial functioning were obtained. The March assessment occurred immediately after the weekly STAND family sessions ceased. The June assessment occurred after the monthly parent-training groups and optional booster problem-solving sessions ended (discussed below). This assessment schedule was chosen to detect acute effects of STAND (in March) as differentiated from maintenance effects (in June). All families completed the March assessment and one family could not be reached for the June assessment. For this family, March parent and adolescent reports were carried forward to June for analyses. Families received $50 per assessment.

As previously documented (Evans et al. 2005) teacher ratings for middle school students with ADHD are difficult to obtain. Completed teacher ratings were required for study entry. At the March and June assessments, we recontacted teachers, but response rate was only 58.3 % for the March and 66.7 % for June. The June rating was used for all students if available. On two occasions, the June rating was unavailable and using a last observation carried forward approach (Shao and Zhong 2003), we used the March rating instead. This procedure yielded a total of 26 post-treatment teacher ratings (72.2 %).

Treatment Description

The specifics for each component are detailed in a manual available from the authors (STAND; Sibley and Pelham 2011a). Each English-speaking family was randomly assigned to one of three clinicians at a large university-based clinic. Three families indicated that they were most comfortable receiving treatment in Spanish. These participants were assigned to a fourth Spanish-speaking clinician. All clinicians participated in a two-day training and demonstrated mastery of the STAND manual through a score of at least 80 % on a procedural test. Clinicians included a post-doctoral trainee, two advanced clinical psychology doctoral students, and a first-year counseling master's student, supervised by a doctoral level licensed clinical psychologist.

STAND teaches parents to increase accountability for academics at home and school in areas of organization, time management, homework, studying, and note-taking (see Table 2). STAND clinicians teach parents and adolescents to work together to: (1) correct problem behaviors, (2) monitor success, and (3) reward good performance. To monitor academic behaviors that occur at school, STAND teaches parents to actively use available web-based technology (i.e., school grade portal) and involve teachers in treatment by setting up a home-school communication system that is appropriate for the middle school setting.

Weekly Family Sessions From January to March, families (adolescents and parents) participated in eight 60 min weekly family sessions (see Table 2 for content). The purpose of the first two sessions is to build parent motivation for academic involvement and conceptualize the case. Sessions 3–6 remediate parent and student skill deficits with standard and individualized skill-building modules. Sessions 7–8 enact a comprehensive plan for monitoring home skill use, implementing a home privilege contract, and communicating regularly with teachers.

Optional Problem-Solving Family Sessions Families were offered up to three additional family sessions after the completion of the eight weekly family sessions. Clinicians kept bi-weekly contact with families during these months to discuss treatment plan adherence and monitor the need for additional problem-solving sessions. During problem-solving sessions, families adjusted home privilege contracts to optimize treatment response and troubleshoot home-school communication difficulties.

Monthly Group Parent Sessions In addition to weekly family sessions, parents attended four monthly group parent training sessions (January–April). These sessions offered parents supplemental skills to independently implement and adjust STAND interventions (see Table 2).

Teacher Meeting After the weekly family meetings ceased, parents were coached to coordinate a teacher meeting attended by the student, the core academic teachers, and the clinician (if desired). At this meeting, parents solicited teacher support and involvement in home-based academic interventions (e.g., parent asking teacher if he/she may email the teacher weekly to check on the student's progress).

Measures of Feasibility and Acceptability

Treatment Fidelity Clinicians audiotaped each weekly family session. Research assistants were trained to code audio-tape sessions using a standard dichotomously coded treatment fidelity checklist for each session. Twenty percent of sessions were randomly selected for an inter-rater reliability probe. Inter-rater reliability was 85.7 %.

Attendance Attendance for each family and group session was measured from therapist contact notes and sign-in sheets completed by research assistants at parent training meetings.

Treatment Credibility At family sessions 2, 5, 8, and post-treatment, treatment credibility was measured from parents and adolescents using a four-item adaptation of the Client Credibility Questionnaire (Borkovec and Nau 1972; Silverman et al. 1999). Parents rated how logical they found treatment and how confident they were in the treatment. Parents responded on a 9-point scale and adolescents on a 3-point scale. High scores indicated stronger credibility.

Therapeutic Alliance At family sessions 2, 5, 8, and post-treatment, the degree to which parents and adolescents enjoyed working with the STAND clinician was measured using the seven-item Therapist Bond Scale (Shirk and Saiz 1992). The TBS items are rated by children and parents on a 4-point Likert-type scale, ranging from 1 (not at all like you) to 4 (very much like you). Internal consistency and convergent validity are strong for this measure (Shirk and Saiz 1992).

Engagement At the end of the 8-weeks, clinicians provided a rating of the parent and adolescent's overall level of participation in the intervention using a ten-item measure (Family Participation Inventory) created for this study. Five items each measured parent and adolescent adherence (e.g., "Please rate how effectively you believe the parent is implementing the recommended strategies," "Please rate the parent's overall openness toward the recommend strategies.") Responses ranged from 1 to 7 with higher values indicating higher participation.

Table 2 Content of STAND family and group sessions

Family sessions (January–March)	
Family session 1: develop a partnership	• Provide an overview of treatment • Provide feedback on results of intake assessment • Develop a summary of family's current concerns
Family session 2: build a treatment plan	• Create hierarchy of presenting problems • Select individualized components from STAND intervention menu • Complete STAND Goal Sheet (end of school year goals) • Develop a discrepancy between current functioning and STAND Goals
Family session 3: daily planner use and organization of school belongings	• Provide feedback on intake measure of planner use and organization • Create planner use plan • Create binder/backpack organization checklist and monitoring plan
Family session 4: structured homework time	• Complete homework problems assessment • Create structured homework plan • Introduce and create sample homework task-list • Set homework time rules
Family sessions 5 & 6: implement up to 3 individualized components (family-selected)	1) Missing assignment tracking 2) Monitoring homework accuracy 3) Calendar use 4) Morning/evening routine 5) Study skills training 6) Note taking training 7) School daily behavior report
Family session 7: building a home privilege program	• Review academic targets selected in sessions 3–6. • Complete communication training activity • Select daily and weekly home privileges • Complete home privilege program worksheet
Family session 8: preparing for the teacher meeting	• Assess desired level of teacher involvement for each STAND component • Complete home-school communication survey • Create agenda for upcoming teacher meeting • Role-play teacher meeting
Optional problem-solving family sessions (up to 3 allotted through May)	• Introduce problem-solving steps • Complete problem-solving worksheet
Group sessions (January–April)	
Group session 1 (January): basics of behavior management	• Subgroup activity: share current problems and goals • Introduce A-B-C Model • Discuss use of rewards • Short-term and long-term benefits of STAND • Overcoming obstacles to participation
Group session 2 (February): developing teacher partnerships	• Current state of home-school communication • Reasonable v. unreasonable expectations for teachers • Positive and negative strategies for interfacing with teachers • Role-play teacher interactions • Addressing teacher non-participation

Table 2 (continued)

Group session 3 (March): building a positive relationship with your adolescent	• Positive attending • Appropriate commands • Benefits of collaborating with adolescent • Obstacles to adolescent academic engagement • Compromise as an effective strategy
Group session 4 (April): adjusting STAND interventions as needed	• When and how to change daily goals • When and how to modify privileges • Strategies for involving new teachers • Troubleshoot current problems with intervention.

Preferences for STAND Components Clinicians recorded which of the seven individualized program components each family selected. Additionally, in June, parents and adolescents provided ratings of the helpfulness of each standard STAND component (see Table 3) and parent training session using a 1 to 5 scale (1=Not at all Helpful to 5=Very Helpful).

Adherence At the post-treatment evaluation, parents and adolescents reported on adherence to the adolescent's individualized treatment plan using a measure created for this study (Adherence Questionnaire- 16 items). The first three items queried each family member's own level of adherence with the daily STAND privilege program and the remaining items examined barriers to daily implementation. Respondents

Table 3 Academic outcome measures at baseline, March, and June assessments

	Baseline *M* (*SD*)	March *M* (*SD*)	June *M* (*SD*)	*F*	Baseline-June *d*
Academic functioning					
Academic problems (P) group x time				**10.89***	**1.30**
STAND	1.60 (.41)	.98 (.55)	.94 (.52)		1.61
TAU	1.73 (.58)	1.65 (.70)	1.72 (.71)		.02
Academic problems (T)[a] group x time				.05	.00
STAND	1.79 (.60)	–	1.57 (.67)		.37
TAU	1.23 (.87)	–	1.08 (.96)		.17
Planner use group x time				**23.50***	**5.15**
STAND	.14 (.13)	.66 (.28)	.58 (.38)		3.38
TAU	.24 (.26)	.14 (.27)	.09 (.22)		−.58
Organization check group x time				1.56	.64
STAND	.58 (.27)	.71 (.27)	.78 (.17)		.74
TAU	.48 (.28)	.54 (.33)	.50 (.33)		.07
GPA[b] group x time (quadratic)				**5.05***	**.25**
STAND	1.69 (.81)	1.94 (.56)	1.92 (.83)		.28
TAU	2.15 (.87)	2.00 (1.00)	2.17 (1.07)		.02
Academic impairment (P) group x time				2.42	.75
STAND	5.19 (1.52)	4.56 (1.21)	3.69 (1.92)		.99
TAU	4.78 (1.00)	4.22 (1.88)	4.22 (1.31)		.56
Academic impairment (T)[a] group x time				.87	−.49
STAND	5.13 (1.57)	–	4.38 (1.93)		.48
TAU	5.20 (1.48)	–	3.70 (2.06)		1.01

Unless otherwise indicated, *F* represents the omnibus statistic for the linear group x time interaction term. *P* parent report, *T* teacher report, *A* adolescent report. Academic problems measured by AAPC; Academic impairment measured by IRS [a] Represents data for *N*=16 STAND participants and *N*= 10 TAU participants for whom a teacher rating was returned at the March or June assessments. [b] GPA effect represents a quadratic interaction effect. Effect sizes for this test reported in text. *$p<.05$

indicated the average number of days per week during the past month that various components of the privilege program were implemented. The remaining items queried barriers on a 0 to 3 scale (0=Never to 3=Often).

Treatment Satisfaction Parents and adolescents provided ratings of treatment satisfaction at post-treatment using a standard satisfaction questionnaire developed for behavioral treatments (MTA Cooperative Group 1999) that was adapted for adolescents. Respondents in both groups indicated their degree of satisfaction for 15 aspects of treatment using a 7-point Likert Scale (1=Strongly Disagree—7=Strongly Agree). Mean satisfaction was calculated.

Measures of Outcome

Adolescent Academic Problems To assess academic problems, the *Adolescent Academic Problems Checklist* (AAPC; Sibley in preparation) was administered to parents and teachers at each assessment. The AAPC is a 25-item scale that assesses academic problems that are common to adolescents with ADHD. Respondents rate specific difficulties as not at all (0), just a little (1), pretty much (2), or very much (3) present. The scale was developed by compiling a list of presenting problems noted by parents and teachers of adolescents with ADHD that were previously treated at our clinic. Parent and teacher AAPC alphas were .91 and .96 respectively.

Planner Use Photocopies of student planners were obtained at each assessment. Observations of planner use during the past week assessed the degree to which the student actively used a daily planner. Percentage of classes for which homework was recorded (or some indication that there was no homework) was calculated for the past five days the student attended school. A planner use percentage was calculated by taking the mean of daily planner use scores.

Organization of School Materials At each assessment, an index of organization was obtained using an adaptation of the Organization Checklist (Evans et al. 2009a). Trained research assistants assessed dichotomously coded items on the organization checklist such as "Is the adolescent's bookbag free from loose papers?" and "does the adolescent have a folder/binder for each core academic class?" Organization checklist scores are shown to correlate with teacher ratings of academic impairment in middle school students with ADHD (Evans et al. 2009a).

Grade Point Average (GPA) At the end of the school year, report cards were obtained from each family. GPA for each academic quarter was calculated by converting all core academic grades to a 4-point scale (i.e., 4.0=A, 3.7=A-, 3.3=B+, 3.0=B, 2.7=B-, 2.3=C+, 2.0=C, 1.7=C-, 1.3=D+, 1.0=D, 0.0=F). Grades were not weighted for class difficulty. The second quarter grade summarized academic performance from late October through early January (baseline). The third quarter grade summarized academic performance from early January through late March (mid-treatment). The fourth quarter grade summarized performance from late March through the end of the school year (post-treatment). Three students attended a school with a trimester grading system. For these students, a last observation carried forward approach was used such that the second trimester grade was carried forward to the third quarter.

Disruptive Behavior Disorder Symptoms Each participant's level of inattention, hyperactivity/impulsivity, and oppositional defiant disorder (ODD) symptom severity were measured at each assessment using the *Disruptive Behavior Disorder Rating Scale* (DBD; Pelham et al. 1992). The DBD is a DSM-IV symptom rating scale that was completed by parents and teachers. Respondents are asked to rate symptoms of ADHD, ODD, and Conduct Disorder (CD) as not at all present (0), just a little (1), pretty much (2), or very much (3). In order to calculate an index of symptom severity the average level (0–3) of each item on the ADHD, ODD, and CD subscales was calculated for each participant. The psychometric properties of the DBD rating scale are very good, with empirical support for distinct inattention, hyperactivity/impulsivity, ODD, and CD factors, and internally consistent subscales with alphas above .95 (Pelham et al. 1992; Pelham et al. 2005; Pillow et al. 1998). In this study, alphas for parent DBD subscales ranged from .71 to .81. Alphas for teacher DBD subscales ranged from .90 to .91.

Functional Impairment The *Impairment Rating Scale* was administered to parents and teachers at each assessment (IRS: Fabiano et al. 2006). Parents and teachers indicated the adolescent's impairment severity in seven domains by marking an X on a line representing the continuum from "no problem" to "extreme problem." Responses were coded 0 (no impairment) to 6 (extreme impairment). The academic impairment item indexed functional impairment. The IRS demonstrates strong psychometrics and accurately identifies impairment in adolescents with ADHD across settings and informants (Evans et al. under review; Fabiano et al. 2006).

Parent-Adolescent Conflict Behavior The parent and adolescent version of the *Conflict Behavior Questionnaire-20* (CBQ-20; Robin and Foster 1989) assessed the parent-teen relationship at each assessment. Respondents rated statements about the parent-teen relationship on a 1 to 5 Likert scale. The CBQ-20 is a 20-item scale that was adapted from the 73-item CBQ (Prinz et al. 1979). CBQ-20 items are the

CBQ items that best discriminated distressed from non-distressed families. It yields a single score that correlates .96 with the CBQ (Robin and Foster 1989). In this study, alpha for the parent and adolescent CBQ-20s were both .92.

Caregiver Strain Parent strain stemming from the parent-adolescent relationship was measured by the 21 item *Caregiver Strain Questionnaire* (CSQ; Branna et al. 1997). At each assessment, the parent indicated how his/her child's problems affected the parents and family over the past four weeks. Responses were scored on a 5-point scale ranging from not at all to very much a problem. The CSQ shows strong psychometric properties and the measure correlates well with other measures of family functioning. In this study, alpha for the CSQ was .92.

Results

TAU Service Utilization

At post-treatment, TAU activities were assessed. Aside from medication use (see Table 1), during the study, 50 % of control parents reported that their child attended regular academic tutoring (compared to 27.8 % of STAND participants), 44.4 % special education services through the school (compared to 50.0 % of STAND participants), and 22.2 % school and community counseling services (compared to 22.2 % of STAND participants). When behavioral treatment was offered after the study, 61.1 % of the TAU group attended at least 50 % of treatment.

Feasibility and Acceptability

Treatment Fidelity Average treatment fidelity ranged from 93.8 % to 100 % across sessions indicating that clinicians implemented STAND with very strong fidelity.

Attendance All families attended 100 % of the eight family sessions between January and March. Only 33.3 % of families requested and received a problem-solving session for the STAND home-privilege program after the weekly family sessions ceased. Attendance for the group parenting sessions was: 77.8 % for January, 77.8 % for February, 38.9 % for March, and 55.6 % for April. Regarding home-school communication, 88.8 % of parents scheduled and attended a teacher meeting at which a plan for regular home-school communication was created collaboratively with all stakeholders.

Treatment Credibility Average parent and adolescent CCQ ratings were stable from week 2 through post-treatment and ranged from 6.88 to 7.13 for parents (0 to 8 scale) and 1.60 to 1.74 for adolescents (0 to 2 scale) across the four assessment points. These scores indicated very high treatment credibility at the beginning, middle, and end of treatment.

Therapeutic Alliance Average parent and adolescent TBS ratings (1 to 4 scale) remained stable from week 2 through post-treatment and ranged from 3.55 to 3.79 for parents and 3.32 to 3.42 for adolescents across the four assessment points. These scores indicated that families enjoyed the sessions and related well to the therapists.

Engagement Therapist ratings of treatment engagement indicated that both parents (M= 5.81, SD= .75) and adolescents (M= 5.17, SD= .91) appeared engaged in the STAND treatment (1 to 7 scale).

Adherence The majority of parents (64.7 %) reported that they correctly implemented the privilege program at least 3 days during the school week and 53.0 % reported regular home-school communication from teachers during the month of May. According to adolescent report, 76.5 % of parents monitored the student's academic targets at least 3 days a week, 82.4 % of parents offered the adolescent an appropriate privilege or restriction, and 64.7 % of teachers provided regular home communication to the parent (at least three days a week). Agreement (Pearson's r) between adolescents and parents on these items was poor for privilege program adherence (.00 to .17) and moderate for teacher communication (.47). Only two barriers to implementing home STAND components were rated above the midpoint of the scale (between "a little" and "sometimes"): parent report of not having enough time and adolescent report of forgetting to write in their planner.

STAND Components Families selected a variety of optional STAND components: missing assignment tracking (33.3 %), homework accuracy monitoring (38.9 %), daily calendar use (33.3 %), morning/evening routine (22.2 %), study skills training (72.2 %), note-taking training (55.6 %), and home-school daily report card for behavior (44.4 %). Rounded to the nearest anchor, all standard STAND components were rated at least a "4" on the 0 (not at all helpful) to 5 (very helpful) scale. The exception was that adolescents rated the structured homework time plan as somewhat helpful (M= 3.06, SD= 1.14). According to parents, the most helpful components were the daily planner intervention (M= 4.65, SD= .86), the bookbag/binder organization intervention (M= 4.65, SD= .70), and each of the parenting sessions: behavior management (M=4.53, SD= 1.12), teacher partnerships (M= 4.59, SD= 1.06), relating to adolescents (M=4.43, SD= .1.08), and adjusting STAND interventions (M= 4.69, .63). The adolescents rated the daily home privilege

program (M= 4.06, SD= 1.14) and setting long-term academic goals (M= 4.00, SD= .95) as the most helpful intervention components.

Satisfaction Parent and adolescent satisfaction with STAND was compared to TAU satisfaction. Two one-way ANOVAs indicated that parents who received STAND expressed very high treatment satisfaction (M= 6.42, SD= .67), significantly more so than the TAU group [M= 4.46, SD= 1.33, F(1,32)= 29.61, p< .001, d= 1.86]. Adolescents who received STAND were also highly satisfied with treatment (M= 5.73, SD= .99), but not significantly more so than TAU adolescents [M= 5.50, SD= .96, F(1,33)= .49, p= .49, d= .24].

Acute Treatment Effects

Using the General Linear Model (GLM), we conducted a series of mixed design analyses (SPSS 19.0) with each outcome variable as the dependent variable and group (treatment vs. control) as the between-subjects predictor. Time (baseline, March, June) was the within-subjects predictor. For teacher-rated outcomes, time was represented by two data points (baseline, post-treatment). Data was available for all 36 participants on each measure of outcome, with the exception of teacher-rated outcomes (only 26 teacher ratings were returned at post-treatment). Cohen's d effect size was calculated as a measure of change over time for each group and interpreted using standard guidelines (.2=small effect, .5=medium effect, .8=large effect; Cohen 1988). To consider relative change between the groups, we calculated an effect size based on the mean baseline to post-treatment change in the STAND group minus the mean baseline to post-treatment change in the TAU group, divided by the pooled baseline standard deviation (Morris 2008). Prior to analyses, all assumptions of the GLM were tested and were supported with the exception of the sphericity assumption for parent report of caregiver strain and hyperactivity/impulsivity. For these two variables, Huyn-Feldt's F-test was used to evaluate model significance.

Academic Outcome Table 3 displays the results of group x time analyses of all academic indices. Significant linear group x time interaction effects were present for parent-reports of academic problems and direct observation of daily planner use. These findings suggested that compared to TAU participants, participants who received STAND made greater gains over time on each of these two indices. Comparison of between-group change over time reveals that effects for STAND were large (1.30 to 5.15). For parent ratings of academic impairment and backpack organization, linear effects for between-group change were medium in size (.64 to .75), but non-significant. No treatment effects were found for teacher rated academic problems or impairment. Post-hoc follow-up tests of significant linear group x time interactions (see Table 3) revealed that for parent-rated academic problems and observation of planner use, the STAND group showed greater improvements than the TAU group from baseline to March. A significant quadratic effect was found for GPA (see Table 3). For GPA, the STAND group showed greater improvements than the TAU group between baseline and March (.48); however the TAU group showed greater improvements in GPA than the STAND group between March and June (.27). Overall, the magnitude of change from baseline to post-treatment was only slightly larger for the STAND group (d=.25; Table 3).

Symptoms and Family Functioning Table 4 displays the results of group x time analyses of all symptom and family functioning indices. Significant linear group x time interaction effects (see Table 3) were present for parent reports of inattention, H/I, and ODD and adolescent report of parent-teen conflict. These findings suggested that compared to TAU participants, participants who received STAND made greater gains over time on these four indices. Comparison of between-group change over time reveals that effects for STAND were large for symptom severity (.83 to 1.42) and medium for parent-adolescent conflict (.65). For parent ratings of parent-teen conflict, linear effects for between-group change were large in size (.82), but non-significant. No treatment effects were found for teacher symptom ratings or parent report of caregiver strain. For H/I and adolescent reported conflict, the STAND group showed greater improvement than the TAU group from March and June, and for ODD, the STAND group showed greater improvements than the TAU group between baseline and June.

For inattention, significant improvements occurred from baseline to march.

Discussion

This study provides preliminary support for a parent-adolescent collaborative approach to treating academic problems in middle school students with ADHD. STAND was: (1) implemented by even novice clinicians with high fidelity, (2) well received by families as evidenced by high levels of treatment engagement and completion, treatment credibility, therapeutic bond, and satisfaction with the intervention, (3) implemented at home by most parents after regular contact with clinicians ceased, and (4) associated with acute parent-reported and objective improvement in academic and symptom domains compared to the TAU group (see Tables 3 and 4). Findings are discussed below.

STAND is a brief intervention that can be delivered by clinicians in clinic, community, or school settings. Even clinicians with relatively little experience implemented

Table 4 Symptom and family outcome measures at baseline, March, and June assessments

	Baseline *M* (*SD*)	March *M* (*SD*)	June *M* (*SD*)	*F*	Baseline-June *d*
DBD Symptoms					
Inattention severity (P) group x time				**6.36***	**1.42**
STAND	2.24 (.41)	1.20 (.53)	1.09 (.54)		2.80
TAU	2.29 (.44)	1.90 (.72)	1.75 (.71)		1.23
Inattention severity (T)[a] group x time				.48	.23
STAND	2.12 (.65)	–	1.72 (.73)		.62
TAU	1.73 (.97)	–	1.52 (1.15)		.22
H/I severity (P) group x time				**6.61***	**1.20**
STAND	1.84 (.56)	1.08 (.55)	.79 (.43)		1.88
TAU	1.55 (.52)	1.15 (.61)	1.15 (.68)		.77
H/I severity (T)[a] group x time				3.65	−.54
STAND	1.39 (.97)	–	1.32 (.82)		.07
TAU	1.24 (1.15)	–	.60 (.87)		.56
ODD severity (P) group x time				**3.63***	**.83**
STAND	1.37 (.60)	.84 (.49)	.64 (.41)		1.22
TAU	1.18 (.49)	1.02 (.70)	.90 (.58)		.57
ODD severity (T)[a] group x time				.35	−.23
STAND	.94 (.85)	–	.92 (.77)		.02
TAU	.86 (.87)	–	.64 (.95)		.25
Family functioning					
Conflict with child (P) group x time			2.23	.82	
STAND	3.15 (.71)	2.91 (.58)	2.81 (.59)		.48
TAU	2.88 (.60)	3.06 (.74)	2.90 (.91)		−.03
Conflict with parent (A) group x time				**4.36***	**.65**
STAND	2.54 (.80)	2.34 (.75)	2.24 (.80)		.38
TAU	2.03 (.57)	2.00 (.54)	2.18 (.59)		−.26
Caregiver strain (P) group x time				1.07	.39
STAND	49.81 (21.60)	48.94 (13.61)	42.12 (12.09)		.36
TAU	48.39 (15.76)	47.39 (11.83)	48.00 (13.46)		.02

F indicates the omnibus statistic for the group x time interaction term. *P* parent report, *T* teacher report, *A* adolescent report. Conflict with parent and child measured by CBQ; Caregiver strain measured by CSQ. [a] Represents data for $N=16$ STAND participants and $N=10$ TAU participants for whom a teacher rating was returned at the March or June assessments. *$p<.05$

STAND with high fidelity. Parents reported high treatment credibility, perceiving STAND as well-tailored to their needs. In addition, families appeared engaged in treatment and reported enjoying STAND. Parents and adolescents indicated strong treatment satisfaction with both standard and individualized treatment components. For example, parents reported that required components (i.e., daily planner use and organization checklist) were helpful and selected a range of individualized components to address the heterogeneous deficits of their adolescents.

Treatment completion was 100 % for family sessions, but parent training group attendance was variable (38.9–77.8 %), as is typical (Chronis et al. 2004). Despite variable attendance, parents maintained that group sessions were very helpful. Previous uses of a parent-based approach to treat adolescents with ADHD report high drop-out rates (18–38 %; Barkley et al. 2001). Perhaps STAND produced strong retention by addressing known barriers. For example, MI primed parents to engage in treatment and increase monitoring of academic habits. Once families displayed openness to the parent-based approach, they learned a range of relevant tools to promote continued academic success (e.g., organization skills training, study skills, behavior modification strategies). MI shows similar effects on treatment initiation and engagement for families of delinquent adolescents (Dishion and Kavanagh 2003) and single mothers of children with ADHD (Chacko et al. 2009).

Parents and adolescents were taught to modify academic habits, monitor and reward success, and communicate effectively with teachers. Thus, they developed skills to implement interventions independently, without regular clinician support. A month after clinician contact ceased,

approximately two-thirds of parents reported consistent implementation of a daily privilege contract and over 50 % reported regular home-school communication. These data suggest preliminary treatment maintenance effects. However, further research is needed to evaluate whether parents resume home academic interventions the following school year.

Acute treatment effects were present for many symptom and academic variables (see Tables 3 and 4). Significant effects were generally large in size (.65–5.15), which is promising, as most controlled academic treatment studies produce very modest effects for adolescents with ADHD (Evans et al. 2011; Molina et al. 2008) or report effects of uncontrolled trials (e.g., Antshel et al. 2012; Langberg et al. 2011; Sibley et al., 2011). Both parent ratings and objective measurement data suggested that adolescents in the STAND group modified their academic habits during the intervention period (see Table 3), while TAU academic habits declined. *Post-hoc* follow-up analyses of the parent AAPC suggested that the greatest effects were present for note-taking during class, turning in homework assignments, bringing required materials to class, and having organized materials. Despite these effects, the STAND and TAU groups did not demonstrate significant effects on teacher rated outcomes and the STAND group displayed only minor improvements in GPA relative to TAU (see Table 3). We speculate a few explanations for the unexpected patterns in teacher rating and GPA data. First, although STAND improved academic habits relative to the TAU group, it is possible that a longer period is needed for these behavioral changes are noticed by teachers. Second, consistent with previous attempts to use teacher ratings as indices of academic change in middle school (e.g., Evans et al. 2007; Schultz et al. 2009) it is possible that this form of data is insensitive to treatment effects. Finally, perhaps the fourth quarter relative increase in GPA displayed by the TAU group (d=.27) occurred as parents, teachers, and students strived to make last minute improvements to end of year grades, which may lead to consequences such as retention, summer school requirements, and academic program eligibility. However, we note that the TAU group's March to June GPA improvement was not accompanied by improvements in academic habits or ADHD symptom severity, as was the STAND group's January to March GPA improvement (d=.48; see Tables 3 and 4).

STAND also produced significant reductions in parent-reported ODD symptoms and adolescent-reported home conflict as compared to the TAU group (see Table 3). In fact, during these months, the TAU group displayed increased parent-adolescent conflict, whereas parent-adolescent relationships appeared to improve in the STAND group. Therefore, it seems that in addition to treating academic difficulties, the parent-based approach produced a secondary benefit of improving parent-directed defiance and the parent-adolescent relationship. This finding is particularly meaningful as parent-adolescent conflict has been cited as a barrier to implementing parent-based interventions for adolescents with ADHD (Barkley et al. 2001; Edwards et al. 2001). The approaches used in STAND may reduce this barrier and enable academic improvement by forging new opportunities for parents and adolescents to cooperate.

Importantly, one-third of families failed to consistently implement home interventions after treatment terminated. Common barriers cited by non-responders included not having time to implement home interventions and poor student response to the daily planner intervention. Thus, efforts to refine STAND might provide additional MI to parents with low involvement and teach parents to modify home privileges when student progress declines. It is our hope that future research will identify moderators of the parent-based approach to better engage non-responding families. Additionally, our failure to find teacher rated effects and our unexpected GPA trends suggest the need to extend follow-up periods to investigate latent treatment effects, consider an alternative timing for intervention delivery (i.e., the fall semester), and conduct a more thorough investigation of the effect of STAND and TAU services on GPA.

Our study possesses important limitations. First, as a preliminary investigation, our sample size limited our statistical power. Therefore, some large and medium treatment effects were non-significant in statistical models. In addition, as is typical with investigations conducted in middle schools (Evans et al. 2005), we possessed only a 72.2 % return rate on teacher ratings. This prevented a thorough analysis of teacher reported problems. We also did not collect fidelity data on the quality of MI implementation. Finally, the poor agreement between parent and adolescent reports of adherence suggests that some reports may not be valid.

In sum, our findings suggest that a parent-adolescent collaborative approach to treating ADHD-related academic problems is promising. This approach was feasible, acceptable, and caused gains in some indices of academic functioning and ADHD/ODD symptoms. Because adolescents with ADHD are notoriously resistant to treatment (Barkley et al. 2001; Evans et al. 2011, 2007) these effects are particularly meaningful. Variability in treatment response suggests that treatment moderators (e.g., degree of initial academic deficit, parent ADHD) and mediators (e.g., direct observations of planner use and organization, level of parent monitoring) should be explored in future larger investigations. In search of active treatment mechanisms, future larger scale studies should investigate how components of the STAND package may individually contribute to treatment response (e.g., parent training attendance, home-school communication plans, selected individual STAND components). If additional research replicates this pilot, the parent-based approach may dramatically improve access to

standard behavioral interventions for adolescents with ADHD. In addition, if delivered in conjunction with a more intensive intervention such as a behavioral summer or after school program, a parent-coordinated approach might also promote treatment maintenance for adolescents with more severe academic deficits.

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