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# Evaluation of MBCT for Adolescents with ADHD and Their Parents: Impact on Individual and Family Functioning

**Jillian Haydicky · Carly Shecter · Judith Wiener · Joseph M. Ducharme**

**Abstract** Adolescents with Attention Deficit/Hyperactivity Disorder (ADHD) often experience emotional and behavioural difficulties which contribute to stress and conflict in their family relationships. Mindfulness-based cognitive therapy (MBCT) is a promising intervention for these families. We evaluated the efficacy of an adaptation of a MBCT intervention for 13–18 year olds with ADHD and their parents. Adolescents (n = 18) and parents (n = 17) attended 8 weekly parallel group sessions. Participants completed questionnaires at four time points: 4 weeks before the intervention to control for general time effects, on the first and last days of the intervention, and 6 weeks after the intervention. Participants reported on adolescent ADHD symptoms, internalizing and externalizing problems, functional impairment, family functioning, parenting stress, and mindfulness. There were no significant changes on parent rated variables during the baseline period. Results of repeated measures ANOVA revealed reductions in the adolescents' inattention, conduct problems, and peer relations problems after the intervention, according to parental report. Parents also reported reductions in parenting stress and increases in mindful parenting. Adolescents did not report improvements on any variables during the intervention period. Paired t-tests indicated that improvements in adolescent symptomatology and mindful parenting were maintained 6 weeks after the intervention ended. Parents reported additional reductions in parenting stress at follow-up. Adolescents reported reductions in internalizing problems at follow-up. Overall, our results support and extend the preliminary findings of previous investigations of MBCT showing it to be a promising treatment for adolescents with ADHD and their parents.

**Keywords** Attention-deficit hyperactivity disorder/ADHD · Mindfulness · Mindful parenting · Adolescents · Treatment

## Introduction

Attention Deficit/Hyperactivity Disorder (ADHD) is characterized by a chronic and pervasive pattern of developmentally inappropriate levels of inattentiveness, hyperactivity and impulsivity manifesting in early childhood (American Psychiatric Association 2000). Individuals with ADHD often exhibit deficits in one or more areas of executive functioning (EF), including verbal working memory, emotion regulation, behavioural inhibition, motivation, planning, strategy generation and implementation, and self-monitoring (Barkley 1997, 2005; Clark et al. 2000; Sergeant et al. 2002; Willcutt et al. 2005). Youth with ADHD combined subtype frequently have comorbid oppositional or conduct disorders (Wolraich et al. 2005), depression (Wilens et al. 2002), and anxiety (Barkley 2004). The deficits associated with ADHD contribute to considerable functional impairment, including low academic achievement (Biederman et al. 2004), and challenges with peer relations (Bagwell et al. 2001). Parents of children and adolescents with ADHD experience higher levels of parenting stress than the general population (Biondic 2011; Johnston and Mash 2001; Theule et al. 2013). Parenting stress occurs when the perceived demands of parenting are greater than the resources for coping (Deater-Deckard 1998). Parenting stress is a byproduct of, and contributor to, maladaptive family

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functioning. High parenting stress is associated with high levels of conflict in the home (Johnston and Mash 2001), and more punitive (Webster-Stratton 1990) and controlling (Putnick et al. 2008) parenting practices, which in turn are related to lower self-concept among adolescents (Putnick et al. 2008).

Although a limited amount of parent-adolescent conflict is adaptive (Smetana et al. 2006; Steinberg 2001), high levels of conflict and low levels of relatedness in families are associated with poorer psychological adjustment and physical health in adolescents (Repetti et al. 2002). Adolescents with a genetic predisposition for behavioural or emotional difficulties are particularly vulnerable to the deleterious effects of family conflict (Repetti et al. 2002). Families with an adolescent with ADHD have higher levels of conflict than other families, particularly when the adolescent exhibits oppositional behaviour (Barkley et al. 1992; Edwards et al. 2001; Markel and Wiener 2012). These families report arguing about more issues, feeling more anger, and using more negative communication than families without an adolescent with ADHD (Barkley et al. 1992; Edwards et al. 2001). When interacting with their children, parents of children with ADHD are less responsive, more over-reactive (Barkley et al. 1991), more controlling (Johnston and Mash 2001) and show low levels of parental support (Khamis 2006). Given the reciprocal effects of adolescent and parent behaviours, a treatment program targeting both parents and adolescents is needed.

Medication management is widely accepted as the most effective treatment for core ADHD symptoms in children (The MTA Cooperative Group 1999). Children taking stimulant medication show improvements in sustained attention, impulsivity, compliance, cooperation, academic performance, and executive functions (Barkley 2004). However, adverse effects, child oppositionality, forgetfulness, parental misconceptions about causes of the disorder, negative social pressure, and fear of stigma may account for the low adherence to medication observed among child samples (Charach et al. 2006; Gau et al. 2006). Adherence to medication continues to decrease sharply throughout adolescence, with up to 70 % of teenagers stopping medication by the age of 15 (Wolraich et al. 2005). As such, alternative treatment approaches for adolescents with ADHD are essential.

While behavioural parent management training has been shown to reduce problem behaviour in children with ADHD, this approach has not been validated with adolescents. Furthermore, treatment approaches should be modified to reflect the increasing independence, self-awareness, and cognitive capacity of adolescents, by including them in treatment planning and developing approaches that involve both parents and adolescents (Chronis et al. 2006). Although behaviour management training, structural family therapy, and parent-adolescent problem solving and

communication training, singly and in combination result in reduced conflict, less anger and better communication between parents and their adolescents with ADHD, there are no differences between the approaches and the degree of clinically significant change is small (Barkley et al. 1992b, 2001). The limited success of such programs may be due, in part, to parenting stress. Parents with high levels of parenting stress are less able to implement effective parenting strategies, and are more likely to drop out of treatment (Friars and Mellor 2007; Kazdin 1995, 1997). Reductions in parenting stress are associated with increased treatment efficacy and better child outcomes (Kazdin and Whitley 2003). However, traditional pharmacological and psychosocial interventions for ADHD do not improve parenting stress (Wells et al. 2000). Thus, interventions designed to improve parent-adolescent relations should also include a stress-management component for parents.

Mindfulness-based interventions address many of the shortcomings of traditional treatment approaches for ADHD. The operational definition of mindfulness proposed by Bishop et al. (2004) states that mindfulness consists of two components: self-regulation of attention, and an open and accepting orientation towards experience. Mindfulness practice involves the deliberate focusing and refocusing of attention on sensations, thoughts and feelings as they arise on a moment-by-moment basis (Williams et al. 2007). Mental events are attended to with an attitude of curiosity, acceptance, and non-reactivity. Mindfulness can be conceptualized as a metacognitive or EF skill, as it involves consciously monitoring cognitive processes. As is true of other skills, mindfulness can be cultivated with intention and effort through formal meditative practice and informal mindful activities. As such, mindfulness practice may benefit individuals with attention and EF difficulties, such as those with ADHD.

Mindfulness has been incorporated into several manualized treatment programs, such as Mindfulness Based Cognitive Therapy (MBCT; Ma and Teasdale 2004; Teasdale et al. 2000) for depression relapse prevention; Mindfulness Based Stress Reduction (MBSR; Kabat-Zinn et al. 1992) for chronic pain and stress-related disorders; Dialectical Behavior Therapy (DBT; Koerner and Linehan 2000) for borderline personality disorder; and Acceptance and Commitment Therapy (ACT; Hayes et al. 2006). In selecting a treatment approach, one must consider the type of impairment experienced by the client, the goals or target outcomes of the intervention, and the capacity of the client to participate in the treatment process. Due to the EF difficulties in adolescents with ADHD, they benefit from direct training in metacognitive strategies (Reid et al. 2005). There is limited evidence supporting cognitive therapy alone as an effective treatment for ADHD beyond

the laboratory setting (Chronis et al. 2006; Pelham et al. 1998). However, cognitive approaches that provide explicit training in self-monitoring and focused attention improve attention-related processes in individuals with ADHD (Toplak et al. 2008). MBCT emphasizes self-monitoring, attention training, and repeated practice of metacognitive strategies, making it an appropriate intervention for reducing the core symptoms of ADHD. For these reasons, we elected to implement and evaluate a MBCT intervention for adolescents with ADHD.

Mindfulness has been established as acceptable and feasible for youth, and preliminary evidence suggests that mindfulness-based approaches ameliorate many of the social, emotional and behavioural difficulties that are experienced by youth with ADHD (Burke 2010). To date, research on the effects of mindfulness training with children and youth has been exploratory in nature. Small sample sizes, lack of randomization and control groups, and reliance on self-report measures make it difficult to interpret results (Black et al. 2009; Burke 2010). To our knowledge, there are no randomized control trials of mindfulness for youth with ADHD, and there is only one published study using a waitlist control group (Haydicky et al. 2012). Results will need to be replicated to confirm preliminary findings. Nevertheless, mindfulness-based interventions show promise as alternative treatment options for children and youth with ADHD.

Studies conducted with youth with ADHD indicate that mindfulness-based interventions effectively target ADHD symptoms and co-occurring internalizing and externalizing difficulties. Single-subject multiple baseline evaluations with school-age children with ADHD showed improvements in child compliance to parental request (Singh et al. 2010), increased on-task behaviour in class, improvements in parent and teacher rated executive functions, and reduced parent and teacher rated hyperactivity (Carboni 2012), compared to baseline. A non-controlled pre-post group design with school-age children with ADHD indicated that mindfulness training results in reductions in parent-rated inattention and hyperactivity/impulsivity, irrespective of medication status (Harrison et al. 2004). A non-controlled study with a mixed sample of adults and adolescents with ADHD found improvements in self-reported attention and objective measures of attention and EF, but adolescent results were not analyzed separately, making it difficult to draw conclusions with respect to the population of interest (Zylowska et al. 2008). A waitlist controlled evaluation of a combined mindfulness and martial arts intervention for adolescents revealed that participants with ADHD showed significant improvements in parent-rated externalizing behavior, oppositional defiant problems and conduct problems. Participants with elevated hyperactive/impulsive symptoms improved on parent-rated social problems and monitoring skills, and those with elevated inattentive symptoms improved on parent-rated social problems, compared to the waitlist control group (Haydicky et al. 2012).

The emerging research on mindful parenting programs in terms of reducing parenting stress for parents of children with disabilities is promising. Mindfulness training for parents of children with developmental disabilities has been shown to reduce parenting stress (Blackledge and Hayes 2006; Singh et al. 2007) and increase parenting satisfaction (Singh et al. 2006).

Mindfulness interventions involving both parents and youth appear to have positive impacts on family relationships. A randomized waitlist control study compared The Strengthening Families Program (an evidence-based intervention designed to improve parenting and delay the onset of risky behaviour in youth) with an adapted version infused with mindfulness, and a waitlist control group. Mothers in the mindfulness-based condition reported greater improvements in mindfulness, anger management, interest in and awareness of their children's emotional experience, and affective behaviour towards their children, compared to the other conditions. They also reported increases in their children's positive affect towards them, and greater decreases in their child's negative affect towards them, compared to the other conditions (Coatsworth et al. 2009).

MYmind is a MBCT intervention for youth with ADHD and their parents. There have been three preliminary evaluations of MYmind with different populations. The first was a non-controlled pre-post evaluation of MYmind for adolescents with externalizing disorders (including only four adolescents with ADHD). Results indicated significant improvements in self-report of attention, internalizing and externalizing problems, and objective measures of sustained attention (Bogels et al. 2008). The second study was a non-controlled pre-post evaluation with 8–12 year old children with ADHD. Results revealed improvements in parent-rated inattention and hyperactivity, as well as parenting stress, parent levels of mindfulness, and parental over reactivity (van der Oord et al. 2012). The third evaluation of MYmind, this time with a small sample (n = 10) comprised only of adolescents with ADHD, reported no significant changes on parent or self-report of attention, EF or internalizing symptoms at post-test. Fathers were the only raters to report improvements in adolescent externalizing problems at post-test. However, changes in adolescent and father-rated attention, and father-rated EF, reached significance at 8-week follow-up. Fathers reported significant reductions in parenting stress at post-test and 8-week follow-up. Results on objective measures of attention and parental report of parenting practices were mixed. Mothers of adolescents with ADHD reported decreases in over reactivity, whereas fathers reported

increases in over reactivity (van de Weijer-Bergsma et al. 2012). Despite the promising results emerging, further research is required to substantiate the efficacy of mindfulness-based cognitive therapy for adolescents with ADHD.

Given the need for further research on the effects of mindfulness meditation for adolescents with ADHD and their families, we conducted an independent investigation of MYmind. The first objective of the study was to support and extend the preliminary findings previously reported with respect to improved attention, internalizing and externalizing problems, and parenting stress, in a Canadian sample of 13–18 year olds with ADHD and their parents. The second objective was to investigate the impact of MYmind on other areas of adolescent and family functioning not previously measured, including functional impairment associated with ADHD, comorbid depression and anxiety, mindful parenting, parent-adolescent conflict, and overall family functioning. We hypothesize that adolescents participating in MYmind will exhibit reductions in ADHD symptomatology, externalizing behaviour (i.e., oppositional-defiant and conduct problems), internalizing problems (i.e., depression and anxiety), and functional impairment (i.e. learning problems, EF problems, and relational problems) at post-test, compared to their functioning at pretest. We predict that parents participating in MYmind will experience less stress in relation to their parenting role at post-test, compared to their parenting stress at pretest. We expect families to report less conflict and improved relationship quality at post-test, compared to their family functioning at pretest. We also predict that adolescents and parents will demonstrate greater levels of mindfulness at post-test, compared to their levels of mindfulness at pretest. We do not expect to find any differences between baseline and pretest functioning. Finally, we hypothesize that treatment gains will be maintained for 6 weeks after completion of the intervention.

## Method

### Participants

Participants were adolescents between the ages of 13–18 with a previous diagnosis of ADHD from a qualified health professional (e.g., physician, psychologist, or psychiatrist). Current ADHD status was confirmed by clinically elevated inattentive and/or hyperactive-impulsive symptoms, as indicated by a $T$-score of 65 or greater on at least one of the DSM ADHD subscales of the Conners' 3 Parent Report at baseline. Although attempts were made to collect corroborating information from schools, teacher reports were not used to confirm ADHD status. Many teacher reports were

returned during or after the intervention, precluding their use as baseline measures. All adolescents were required to have average cognitive abilities, indicated by an IQ estimate of at least 85 on the wechsler abbreviated scale of intelligence (WASI). Participants with autism spectrum disorders, youth with severe behavioural problems constituting a safety risk, or those who were living outside of the home (e.g., residential treatment services) were not eligible to participate. At least one parent was required to participate in the intervention with their child. Six families elected to enroll both parents. One family enrolled one parent for two adolescent siblings.

Twenty adolescents, 18 mothers, and six fathers initially enrolled in the program. Intervention completers were defined as individuals who attended at least 6 of 8 sessions, or those who attended fewer than six sessions and demonstrated a high level of commitment to the program. Commitment was established by attending individual make-up sessions, responding to email questionnaires several times per week, and meditating at home several times per week. Participants were asked to track home meditation practice via daily email questionnaires. One parent and two adolescents attended fewer than six sessions but were categorized as intervention completers because they demonstrated high levels of commitment and adherence to the program. On average, adolescents attended 6.78 sessions (SD = 1.11) and parents attended 6.94 sessions (SD = 0.9). Two adolescents (one male), two fathers, and one mother did not complete the intervention due to personal health or scheduling issues. Of the adult intervention completers, seven parents had a (male) spouse who chose not to participate in the intervention for reasons unknown. Six had spouses who participated to some degree in the intervention. Of those spouses, three attended between 4 and 6 sessions but were not considered intervention completers and did not complete post-test questionnaires; the other three spouses completed the intervention. The identified primary caregiver was included in analyses; the remaining three eligible caregivers were excluded to prevent double-counting of adolescents (i.e., if some adolescents were rated twice, undue weighting would be placed on their particular pattern of symptoms, and the group means would be skewed). The results reported herein are based on maternal report, with the exception of one father who was the primary caregiver/attendee of the family. There were not enough fathers to be included in a separate analysis. The final sample for data analyses consisted of 18 adolescents (5 females, 13 males) and 17 parents.

The mean age of adolescent participants was 15.5 (SD = 1.58). The mean IQ score was 108.28 (SD = 10.87). Approximately 67 % (n = 12) of the adolescents presented with both inattentive and hyperactive symptoms. Approximately 28 % (n = 5) displayed primarily inattentive

symptoms, while only 6 % (n = 1) displayed primarily hyperactive/impulsive symptoms. More than half of the sample (n = 11; 61 %) was taking medication for their ADHD when they enrolled in treatment. Over three quarters (n = 14; 78 %) of the sample disclosed a comorbid diagnosis: 67 % (n = 12) reported a previous diagnosis of Learning Disability; 22 % (n = 4) a previous diagnosis of a depressive disorder; and 6 % (n = 1) a previous diagnosis of anxiety disorder. Twenty-two percent (n = 4) were taking medication to treat comorbid disorders. Prior to enrolling in mindfulness training, 50 % (n = 9) of the families had attempted another behavioural intervention and 61 % (n = 11) had attempted family therapy. Approximately one quarter of the adolescents had a parent with a self-disclosed diagnosis of ADHD (n = 4 or 22 % fathers; n = 1 or 6 % mothers).

Demographic information pertaining to family composition is based on 17 families. Most families were intact at the time of the intervention, with 77 % (n = 13) of parents either married or cohabitating. Approximately 24 % (n = 4) of parents were single, separated or divorced. The number of children living in the home varied: 88 % (n = 15) of families had three or fewer children at home and 12 % (n = 2) had more than three children at home. All of the mothers and all but one of the fathers completed secondary school. With respect to mothers' highest level of education, 35 % (n = 6) reported completing a college program, 35 % (n = 6) reported earning a Bachelor's degree, and 18 % (n = 3) reported earning a Master's degree. With respect to fathers' highest level of education, 12 % (n = 2) completed a college program, 47 % (n = 8) earned a Bachelor's degree, 12 % (n = 2) earned a Master's degree, and 12 % (n = 2) earned a Doctoral degree. Sixty-five percent (n = 11) of mothers were employed full-time, 18 % (n = 3) were employed part-time, and 18 % (n = 3) were unemployed. More than three quarters (n = 13; 77 %) of fathers were employed full time, 6 % (n = 1) were employed part-time, and 18 % (n = 3) were unemployed. Slightly more than half of the parents were born in North America (n = 10 or 59 % of mothers and fathers each). Twelve percent (n = 2) of mothers and 6 % (n = 1) of fathers were of European origins. Eighteen percent (n = 3) of mothers and 24 % (n = 4) of fathers immigrated to Canada from Asian countries. Twelve percent (n = 2) of mothers and 6 % (n = 1) of fathers were from Caribbean countries.

MYmind Program Description

MYmind, based on the empirically validated mindfulness-based cognitive therapy developed by Segal, Williams and Teasedale (MBCT; 2002), is an 8 week manualized group treatment program for adolescents with ADHD and their parents. The purpose of MYmind is to foster mindfulness through training in formal meditation practices, and to integrate this awareness and attitude into the context of daily life as a means to cope with ADHD symptoms, stress, family relations and difficult emotions. It was originally developed and piloted in the Netherlands (Bogels et al. 2008). For the purposes of the current study, the manual and participant handouts were translated from Dutch into English, with review by the original authors for accuracy. We modified the Canadian version of the manual to reflect the goals of the current study and to meet the needs of the population under investigation. For example, psycho education about the history, meaning and applications of mindfulness was added because many participants were novices to mindfulness. To enhance treatment adherence, we sent participants daily text messages reminding them to practice mindfulness at home. Reflection sheets were incorporated into the 4 and 8th sessions in order to gauge treatment impact, enhance motivation for change, and maintain therapeutic rapport.

Families were enrolled in the program after an intake interview to assess readiness and suitability for the program. Parents and adolescents attended parallel groups. For both groups, each 1.5 h session consisted of activities and discussions related to major themes, and included elements of mindfulness, cognitive behavioural therapy (CBT), and psycho education. The core mindfulness concepts emphasized throughout the program were awareness, non-judging, acceptance, letting go, beginner's mind, and presence in the moment. Mindfulness exercises included the body scan, 3 min breathing space, sitting meditation, and mindfulness in everyday activities such as eating. These exercises were modified for the needs of the participants. For example, adolescents began with very brief meditations (e.g., 5 min), and gradually increased the length of meditation each week. The groups discussed the application of mindfulness practices to their everyday struggles (e.g., breathing space before a test or during an argument). The CBT component of the program consisted of identifying thoughts, feelings and sensations; exploring the ways thoughts and feelings influence actions; recognizing cognitive distortions; and noticing automatic thoughts and patterns of behaviour. In keeping with the philosophy of mindfulness, emphasis was placed on awareness and acceptance of internal and external experiences. Psycho education about mindfulness, attention, and ADHD was delivered in the initial sessions through videos, didactic presentations and discussions, and reviewed in subsequent sessions as needed. For a summary of the main themes and exercises, see Table 1.

Home exercises were a required component of the program. Each family was given a CD with guided meditations to support their home practice. Parents and adolescents also received workbooks containing summaries of key concepts, assignments, and space to record their experiences during the week. Home assignments were taken up with the facilitators

in session. Participants were asked to track the number of minutes of meditation they engaged in at home via daily email questionnaires. In order to increase levels of engagement and reduce the risk of dropout, adolescents earned points for participation in mindfulness exercises in session and at home. These points were exchanged for rewards from parents (e.g., computer time) and from facilitators (e.g., movie passes). A joint parent-adolescent booster session was held approximately 6 weeks after the completion of the intervention. The purpose of the booster session was to review progress toward goals, trouble-shoot with families who were having difficulty maintaining their mindfulness practice, and provide individualized feedback about improvements to each family.

Groups were facilitated by doctoral students with Masters degrees in clinical child psychology who had therapeutic experience with children and families. Both facilitators were Caucasian, female, and in their mid-twenties. Facilitators attended a 12 week mindfulness course for mental health professionals and practiced mindfulness meditation regularly. Supervision was provided in vivo during sessions and in weekly debriefing meetings with two registered clinical child psychologists. One facilitator ran all five parent groups and the other facilitator ran all five adolescent groups to ensure treatment consistency and to control for therapist effects. Facilitators followed the manual closely to ensure treatment fidelity.

Design

Five phases of data were collected over a period of 1 year to garner a sufficient sample size. Each phase consisted of

**Table 1** Brief overview of the content of adolescent and parent sessions

| Theme | Activities |
| --- | --- |
| Adolescent sessions | |
| 1. Attention | Welcome, sitting meditation, psycho education about ADHD, group contract, review points system, mindful eating activity |
| 2. At home in your body | Sitting meditation, psycho education about mindfulness, body scan, yoga with emphasis on body |
| 3. Breath | Sitting meditation, breath for daily activities, 3-min breathing space, yoga with emphasis on breath |
| 4. Distraction and the wandering mind | Bubble meditation, fixation exercise (stationary point vs. moving object), attention to detail game, meditation with sounds, yoga, half-way reflection |
| 5. Thoughts are not facts/doing homework mindfully | Movie theatre meditation; moods, thoughts and alternative viewpoints exercise; detective thinking to challenge automatic thoughts; impulse control activity with candy bar; applying mindfulness skills to homework; yoga |
| 6. Automatic reactions | Sitting meditation, automatic pilot (expressway vs. pathway), role-play, yoga, breathing space with coping and choices |
| 7. Mindful communication | Sitting meditation with stressful event and empathy; thoughts, feelings and sensations related to automatic pilot; being present in communication; mindful listening role play; yoga |
| 8. On your own | Sitting meditation, adolescent-led mindfulness exercises, reflection activity, action plan for continuing mindful practice, Metta meditation |
| Parent sessions | |
| 1. Awareness | Welcome and introductions, sitting meditation, rationale of training, raisin exercise, introduction to mindfulness, explanation of homework assignments and adolescents' reward system |
| 2. At home in your body | Sitting meditation with emphasis on body, discussion of obstacles to home practice, psycho education about ADHD, psycho education about mindfulness and its connection to parenting, body scan |
| 3. Breath | Sitting meditation with emphasis on the breath, pleasant events calendar and triangle of awareness, poem and awareness activity, introduction to 3-min breathing space |
| 4. Responding with awareness | Sitting meditation, unpleasant events calendar, psychoeducation about stress and automatic responding, responding with awareness activity, 3-min breathing space, half-way reflection |
| 5. Automatic reactions and patterns | Sitting meditation, psychoeducation and discussion about automatic behaviour patterns/parenting practices, sitting meditation with stressful event and empathy |
| 6. Communication and empathy | Sitting meditation, role-play on communication with child, mindful listening activity, breathing space with coping and choices |
| 7. Acceptance and boundaries | Sitting meditation, perception poem and reflection, breathing space with feeling boundaries, changing versus accepting action plan, mountain meditation |
| 8. On your own | Sitting meditation, written inquiry, presentation of symbol or experience, reflection activity, action plan for continuing mindful practice, Metta meditation, discussion of booster session |

an adolescent group comprised of 3–5 individuals, and a parent group comprised of 3–8 individuals. Participants who met the inclusion criteria were assigned to treatment groups on a first come, first served basis. Due to ethical and practical considerations, a randomized control design was not implemented. Participants served as their own controls during a baseline period of 4 weeks prior to the onset of the intervention. Data were collected at four time points: baseline, pre-test (Session 1 of the intervention), post-test (Session 8 of the intervention), and follow-up (approximately 6 weeks after Session 8). For all analyses, the within subjects factor, or independent variable, was time (baseline, pre, and post-test) and the dependent variable was the parent or youth report of the construct under investigation. Specifically, the dependent variables were ADHD symptoms, externalizing behaviour, and functional impairment of youth as measured by Conners 3 parent and youth report; adolescent internalizing symptoms as measured by the Revised Child Anxiety and Depression Scale parent and youth report; parenting stress as measured by the Stress Index for Parents of Adolescents; family functioning as measured by the Family Assessment Device; parent-adolescent conflict as measured by the Issues Checklist; mindful parenting as measured by the Interpersonal Mindfulness in Parenting Scale; and parent and youth acceptance as measured by the Acceptance and Action Questionnaire. We hypothesize that no change will occur during the baseline (no treatment) phase. We expect changes in dependent variables to occur between pre and post-test (treatment phase). We anticipate that there will be no change in the dependent variables between post-test and follow-up (no treatment).

## Procedures

The research was approved by the University of Toronto's Research Ethics Board. Families who had previously given consent to be contacted for research purposes were contacted by telephone and invited to participate in the current study. Participants were also recruited from the community via flyers in schools, community centres, and physician's offices, internet advertisements, and ADHD websites. Interested families participated in a telephone intake process to determine eligibility for the study. The intake included a demographics questionnaire and diagnostic screening. In families with multiple children, siblings who met inclusion criteria were also invited to participate. The telephone intake was conducted by trained undergraduate research assistants. Prior to beginning the intervention, adolescents and their parents attended an intake interview and/or an information session conducted by the primary investigators. The program goals, expectations, potential risks and benefits, and confidentiality were explained in detail. Informed consent and assent were obtained at this time. Data were collected from adolescents and parents in separate group testing sessions overseen by the primary investigators. Participants were also asked to complete short daily email questionnaires tracking their meditation, conflict, stress, and ADHD symptoms throughout the intervention. This data was collected for another research study, and results are reported elsewhere.

## Measures

### Descriptive Variables

*Wechsler Abbreviated Scale of Intelligence (WASI;* Wechsler 1999). The WASI is a standardized abbreviated intelligence test which provides an estimate of general cognitive ability. Vocabulary and matrix reasoning subtests were administered to obtain an IQ estimate. The IQ score derived from two subtests has an average reliability coefficient of .96.

### Outcome Variables

*Conners—3rd Edition (*Conners 2008) The Conners 3 is often used to screen for ADHD in children and adolescents. The parent (Conners 3-P) and adolescent self-report (Conners 3-SR) scales were used in the current study. This measure evaluates inattention and hyperactivity/impulsivity as well as learning problems, aggression, oppositionality, and relationships with others. Internal consistency coefficients range from .77 to .97.

*Revised Child Anxiety and Depression Scale—Youth and Parent Report (RCADS;* Chorpita et al. 2000) The RCADS is a screen for depression and anxiety disorders in youth ages 6–18. The questionnaire consists of 47 Likert-scale items and yields six subscales corresponding to the DSM-IV categories of Separation Anxiety Disorder, Social Phobia, Generalized Anxiety Disorder, Panic Disorder, Obsessive–Compulsive Disorder, and Major Depressive Disorder. Both parent and youth self-report versions demonstrated good internal consistency and discriminant validity among youth in clinic-referred samples (Chorpita et al. 2005; Ebesutani et al. 2010).

*The Stress Index for Parents of Adolescents (SIPA;* Sheras et al. 1998) This measure is used to identify areas of stress for parents of adolescents ages 11–19 years. The SIPA is a 112-item measure that assesses parenting stress across three domains: an adolescent domain, a parent domain, and an adolescent-parent relationship domain. The adolescent domain measures parenting stress as a function of the characteristics of the adolescent (e.g., mood, social isolation, delinquency, motivation). The parent domain measures parenting stress as a function of the effect of parenting on the

parent's other life roles (e.g., their relationship with their friends and their spouse, their level of confidence and feelings of competence). The adolescent-parent relationship domain measures the perceived quality of the relationship the parent has with the adolescent (e.g., degree of communication, amount of affection). In addition, the SIPA provides a measure of life stressors experienced by the parent in the past year (e.g., death in the family, financial problems) and an index of total parenting stress (i.e., a composite of all SIPA items across all domains). This measure has very good internal consistency (subscales range from .80 to .90 and the domain indices exceed .90).

*Family Assessment Device (FAD;* Epstein et al. 1983*)* The FAD is based on the McMaster Model of Family Functioning, which describes the structure, organization, and relational patterns characteristic of healthy families. This is a self-report measure that describes emotional relationships and functioning within the family. Each family member rates 60 statements on a scale from 1 ("Strongly Agree") to 4 ("Strongly Disagree"). The FAD yields seven subscale scores: problem solving (the ability to resolve problems that threaten the functioning of the family), communication (the ability to exchange information in a clear and direct manner), roles (the ability to assign and carry out tasks essential for family functioning), affective responsiveness (the extent to which family members experience an appropriate range of affective responses), affective involvement (the extent to which family members are interested in one another's activities and feelings), behaviour control (the way family upholds standards of behaviour), and general functioning (overall health of the family unit). Acceptable reliability (alphas ranging from .72 to .92) and validity have been demonstrated.

*Issues Checklist (IC;* Robin 1975; Prinz et al. 1979*)* Essential issues that might lead to arguments between parents and adolescents were assessed using the Issues Checklist. The IC is a 44-item list of issues that may be areas of disagreement between parents and adolescents. For the purposes of the current study, the vocabulary of the questionnaire was modified to reflect current linguistic and cultural trends (e.g., stereo was changed to music) and an item on Internet/computer use was added. Participants identified issues that had been discussed in the last month, and rated the intensity of the discussion on a Likert scale ranging from 1 ("calm") to 5 ("very angry"). Acceptable test–retest reliability and discriminant validity have been established (Edwards et al. 2001). Both parent and adolescent reports were administered.

*Acceptance and Action Questionnaire (AAQ;* Hayes et al. 2004*)* The AAQ is a 9-item scale designed to assess experiential avoidance (tendency to avoid unwanted internal experiences), experiential control, psychological acceptance, and ability to take action despite aversive internal stimuli. Participants rated statements on a Likert scale with responses ranging from 1 ("never true") to 7 ("always true"). High scores on the AAQ are reflective of greater experiential avoidance and immobility, while low scores reflect greater acceptance and action. The AAQ has adequate internal consistency for use in research as well as convergent and construct validity.

*Interpersonal Mindfulness in Parenting Scale (IM-P;* Duncan 2007*)* The IM-P is a 10-item questionnaire assessing four domains of mindful parenting: (1) awareness and present-centered attention of self and child during parenting interactions; (2) present-centered emotional awareness of self and child; (3) non-reactivity or low reactivity to child behaviour (i.e. self-regulation; (4) non-judgmental acceptance of self and child. The IM-P demonstrates adequate reliability (alpha = .72), and preliminary convergent and discriminant validity in relation to mindfulness and other parenting constructs.

Data Analysis

To investigate treatment effects, we conducted one-way repeated-measures analyses of variance (ANOVA) on all variables. The effect size reported for the overall model is partial eta$^2$. Values less than 0.06 are considered small effect sizes, values between 0.06 and 0.14 are medium effect sizes, and values greater than 0.14 represent large effect sizes (Green and Salkind 2008). When ANOVA results indicated significant time effects, we conducted post hoc pairwise comparisons. The familywise error rate across pairwise comparisons was controlled using the Bonferroni procedure within the statistical analyses software SPSS, and the adjusted p-values were judged against the threshold of $p = .05$. We conducted paired t-tests to determine whether significant changes occurred in the follow-up period (between post-test and follow-up). The effect size statistic for this test is Cohen's *d*, where values around 0.2 are considered small, values around 0.5 are considered medium, and values around 0.8 are considered large (Green and Salkind 2008). Means and standard deviations for all dependent variables were computed to determine the direction of change; they are displayed in Tables 2, 3, and 4. The percentage of participants scoring in the Clinical range on the Conners 3 and SIPA at each time point are shown in Tables 2 and 3. A cross-lagged panel correlation was computed post hoc to investigate the relationship between mindful parenting and parenting stress.

## Results

### Adolescent Symptoms: ADHD, Externalizing and Internalizing Problems, and Functional Impairment

We hypothesized that adolescents would demonstrate reductions in ADHD symptoms, comorbid externalizing and internalizing problems, and functional impairment at

post-test, compared to pretest ratings. As shown in Table 5, results of the repeated measures ANOVA on the Conners' 3 revealed a significant time effect on the DSM-IV Inattentive, Learning Problems, Executive Function and Peer Relations scales, and a nearly significant effect on the Conduct Disorder scale, as rated by parents. Adolescents reported significant time effects on the Family Relations Scale and nearly significant effects on the Oppositional Defiant Disorder scale of the Conners' 3. They also reported significant time effects on the Depression, Anxiety, and Total Internalizing problems scales of the RCADS.

Post-hoc pairwise comparisons indicated that there were no significant changes on parent rated variables during baseline. There were significant reductions in parent-rated conduct problems and peer relational problems, as well as nearly significant reductions in inattention, between pre- and post-test (see Fig. 1). The pretest/post-test comparisons were not significant for any other variables. Adolescents reported

reductions in oppositional problems and family relational problems during the baseline period only; no further changes were evident during the intervention period.

## Parenting Stress

We predicted that parents would experience less stress in relation to their parenting role at post-test, compared to their parenting stress at pretest. Results of the repeated measures ANOVA for parenting stress on the SIPA indicated significant changes in select areas of stress (Table 6). Significant time effects were found in Social Isolation/ Withdrawal and Failure to Achieve in the adolescent domain, and Life Restrictions in the parent domain. Post-hoc comparisons revealed no changes during baseline on any variables. There were significant reductions in stress related to social isolation/withdrawal and life restrictions between pretest and post-test (see Fig. 2).

**Table 2** Means, standard deviations, and clinical levels of adolescent symptomatology

| Dependent variable | Baseline | | | | Pre-test | | | | Post-test | | | | Follow-up (n = 14) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | M | SD | Clinical | n | M | SD | Clinical | n | M | SD | Clinical | M | SD | Clinical |
| ADHD symptoms | | | | | | | | | | | | | | | |
| P: Inattentive | 18 | 81.17 | 8.68 | 94.4 | 17 | 79.94 | 11.22 | 88.2 | 17 | 71.76 | 9.22 | 76.5 | 70.64 | 11.26 | 64.3 |
| P: H/I | 18 | 78.17 | 13.35 | 72.2 | 17 | 77.06 | 14.58 | 76.5 | 17 | 71.35 | 11.78 | 70.6 | 67.93 | 13.93 | 57.1 |
| A: Inattentive | 18 | 64.28 | 10.69 | 38.9 | 18 | 58.61 | 10.26 | 27.8 | 18 | 60.22 | 10.32 | 38.9 | 58.79 | 11.69 | 21.4 |
| A: H/I | 18 | 61.06 | 10.45 | 22.2 | 18 | 57.72 | 10.49 | 22.2 | 18 | 56.44 | 11.50 | 22.2 | 57.29 | 9.63 | 28.6 |
| Externalizing symptoms | | | | | | | | | | | | | | | |
| P: CD | 18 | 61.89 | 14.42 | 33.3 | 17 | 64.76 | 14.45 | 35.3 | 17 | 56.00 | 10.31 | 17.6 | 52.00 | 6.04 | 0.00 |
| P: ODD | 18 | 70.22 | 14.03 | 61.1 | 17 | 71.41 | 13.92 | 70.6 | 17 | 64.94 | 12.35 | 47.1 | 59.64 | 7.62 | 14.3 |
| A: CD | 18 | 59.50 | 13.26 | 33.3 | 18 | 54.33 | 15.65 | 22.2 | 18 | 55.39 | 13.49 | 33.3 | 49.57 | 13.83 | 7.1 |
| A: ODD | 18 | 55.28 | 10.16 | 22.2 | 18 | 49.22 | 10.70 | 5.6 | 18 | 52.50 | 10.29 | 11.1 | 50.21 | 8.52 | 0.00 |
| Internalizing symptoms | | | | | | | | | | | | | | | |
| P: Depression | 17 | 65.29 | 11.25 | 47.1 | 17 | 68.00 | 12.51 | 64.7 | 16 | 64.19 | 11.32 | 62.5 | 61.29 | 11.41 | 42.9 |
| P: Anxiety | 17 | 52.47 | 10.52 | 17.6 | 17 | 55.18 | 13.43 | 23.5 | 16 | 53.31 | 10.02 | 12.5 | 49.14 | 8.51 | 7.1 |
| P: Internalizing | 17 | 55.94 | 10.24 | 17.6 | 17 | 58.82 | 12.25 | 29.4 | 16 | 57.56 | 11.05 | 25.0 | 52.29 | 9.08 | 7.1 |
| A: Depression | 18 | 57.72 | 10.54 | 33.3 | 18 | 53.83 | 12.85 | 27.8 | 18 | 51.5 | 12.19 | 16.7 | 48.36 | 11.15 | 7.1 |
| A: Anxiety | 18 | 50.06 | 14.55 | 16.7 | 18 | 46.56 | 12.89 | 11.1 | 18 | 45.11 | 12.49 | 5.6 | 41.07 | 10.78 | 0.00 |
| A: Internalizing | 18 | 51.89 | 13.95 | 16.7 | 18 | 48.22 | 13.38 | 16.7 | 18 | 46.72 | 13.07 | 16.7 | 42.29 | 11.05 | 7.1 |
| Functional impairment | | | | | | | | | | | | | | | |
| P: Learning | 18 | 74.22 | 11.95 | 83.3 | 17 | 72.12 | 10.14 | 82.4 | 17 | 66.53 | 9.98 | 47.1 | 63.43 | 12.20 | 42.9 |
| P: Executive function | 18 | 75.00 | 11.46 | 83.3 | 17 | 71.76 | 12.44 | 76.5 | 17 | 67.59 | 11.31 | 52.9 | 64.86 | 12.28 | 50.0 |
| P: Peer relations | 18 | 70.22 | 18.16 | 66.7 | 17 | 69.53 | 17.54 | 58.8 | 18 | 60.82 | 17.66 | 35.3 | 61.57 | 17.54 | 35.7 |
| A: Learning | 18 | 60.94 | 8.95 | 44.4 | 17 | 57.18 | 8.66 | 23.5 | 18 | 59.83 | 9.33 | 38.9 | 60.29 | 12.77 | 50.5 |
| A: Family relations | 18 | 52.94 | 10.77 | 16.7 | 18 | 49.06 | 11.05 | 5.6 | 18 | 50.78 | 11.83 | 5.6 | 46.64 | 6.82 | 0.00 |

Mean values reported are *t* scores. "P" denotes parental report, and "A" denotes adolescent self-report. "CD" denotes Conduct Disorder, and "ODD" denotes Oppositional Defiant Disorder. "Clinical" denotes the percentage of adolescents exhibiting symptoms in the clinical range. Adolescents were classified in the clinical range if T-scores were 1.5 standard deviations above the mean, which corresponds to a T-score of 65 or greater

**Table 3** Means, standard deviations and clinical levels of parenting stress

| Dependent variable | Baseline (n = 16) | | | Pre-test (n = 17) | | | Post-test (n = 18) | | | Follow-up (n = 14) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | SD | Clinical | M | SD | Clinical | M | SD | Clinical | M | SD | Clinical |
| Adolescent domain | 60.75 | 10.09 | 37.5 | 61.12 | 10.28 | 47.1 | 57.11 | 11.24 | 27.8 | 55.00 | 7.79 | 7.1 |
| Parent domain | 54.75 | 10.84 | 12.5 | 55.12 | 10.48 | 17.6 | 52.28 | 7.60 | 5.6 | 46.43 | 8.98 | 0.00 |
| Relationship domain | 55.13 | 10.03 | 12.5 | 54.29 | 12.13 | 17.6 | 54.22 | 11.09 | 16.7 | 49.79 | 7.54 | 0.00 |
| Total parenting stress | 58.75 | 7.57 | 25.0 | 58.82 | 9.50 | 29.4 | 55.78 | 8.50 | 16.7 | 51.36 | 6.40 | 7.1 |
| Life stressors | 51.56 | 8.67 | 12.5 | 50.06 | 6.85 | 0.00 | 47.72 | 6.13 | 0.00 | 49.07 | 6.89 | 0.00 |
| Adolescent domain scales | | | | | | | | | | | | |
| Moodiness | 59.06 | 10.61 | 43.8 | 59.24 | 11.71 | 41.2 | 56.56 | 11.30 | 27.8 | 55.29 | 9.29 | 21.4 |
| Social isolation/withdrawal | 59.75 | 12.03 | 37.5 | 60.82 | 11.48 | 41.2 | 54.28 | 12.15 | 16.7 | 53.79 | 11.03 | 21.4 |
| Delinquency/antisocial | 68.25 | 13.35 | 56.3 | 70.12 | 11.83 | 64.7 | 67.61 | 13.65 | 50.0 | 66.07 | 13.65 | 42.9 |
| Failure to achieve | 61.94 | 11.99 | 43.8 | 61.65 | 11.31 | 41.2 | 59.00 | 11.81 | 38.9 | 57.79 | 9.04 | 35.7 |
| Parent domain scales | | | | | | | | | | | | |
| Life restrictions | 56.31 | 11.60 | 37.5 | 57.12 | 9.92 | 23.5 | 50.67 | 9.64 | 5.6 | 45.14 | 9.68 | 0.00 |
| Social alienation | 48.44 | 9.33 | 6.3 | 49.24 | 10.62 | 5.9 | 48.83 | 7.98 | 5.6 | 45.14 | 7.25 | 0.00 |
| Incompetence/guilt | 51.69 | 9.11 | 0.00 | 52.59 | 11.42 | 11.8 | 51.56 | 10.21 | 16.7 | 49.29 | 9.10 | 7.1 |

Values reported are T-scores. "Clinical" denotes the percentage of parents exhibiting symptoms in the clinical range. Parents were classified in the clinical range if T-scores were 1.5 standard deviations above the mean, which corresponds to a T-score of 65 or greater

**Table 4** Means and standard deviations of family functioning and mindfulness variables

| Dependent variable | Baseline | | | Pre-test | | | Post-test | | | Follow-up | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n | M | SD | n | M | SD | n | M | SD | n | M | SD |
| Parent report general family functioning | 17 | 2.10 | 0.50 | 16 | 2.06 | 0.54 | 16 | 1.89 | 0.39 | 13 | 1.91 | 0.44 |
| Adolescent report general family functioning | 18 | 2.19 | .45 | 18 | 2.06 | 0.47 | 18 | 2.02 | 0.37 | 14 | 1.95 | 0.41 |
| Parent report no. of conflicts | 18 | 15.90 | 9.32 | 17 | 14.18 | 7.77 | 17 | 11.18 | 7.60 | 14 | 8.50 | 8.35 |
| Adolescent report no. of conflicts | 18 | 10.83 | 8.18 | 18 | 8.72 | 7.27 | 18 | 8.56 | 6.56 | 14 | 7.50 | 8.07 |
| Parent report conflict intensity | 18 | 2.64 | 0.49 | 16 | 2.78 | 0.62 | 14 | 2.65 | 0.50 | 13 | 2.40 | 0.38 |
| Adolescent report conflict intensity | 17 | 2.79 | .51 | 17 | 2.59 | 0.62 | 17 | 2.91 | 0.67 | 11 | 2.77 | 0.66 |
| Mindful parenting | 16 | 3.57 | 0.37 | 16 | 3.42 | 0.36 | 17 | 3.66 | 0.28 | 12 | 3.76 | 0.26 |
| Parent acceptance | 16 | 31.25 | 6.89 | 16 | 28.69 | 7.55 | 17 | 29.06 | 5.74 | 13 | 26.00 | 6.00 |
| Adolescent acceptance | 18 | 41.28 | 7.36 | 18 | 38.89 | 7.15 | 18 | 38.44 | 6.23 | 14 | 35.71 | 7.10 |

Ratings of general family functioning range from 1 to 4, with higher scores representing poorer functioning. Mean scores of two or greater in this domain are considered to be in the clinical range. Ratings of conflict intensity range from 1 to 5, with higher scores representing more anger. Mindful parenting mean scores range from 1 to 5, with higher scores representing higher levels of mindfulness. Acceptance scores are sums from the Acceptance and Action Questionnaire. Total sum scores can range from 9 to 63, with higher scores representing greater experiential avoidance and immobility, and lower scores reflecting greater acceptance and action

Family Functioning

We hypothesized that families would experience less conflict and improved relationship quality at post-test, compared to their pretest levels of family functioning. As shown in Table 7, results of repeated measures ANOVA for the Issues Checklist revealed no significant effects for the number or intensity of conflicts reported by parents. Parents reported significant time effects for overall family functioning on the Family Assessment Device, but there were no significant post hoc pairwise comparisons. Although adolescents did not report changes in the amount of conflict, they did report a significant time effect for conflict intensity; however, post hoc pairwise comparisons were not significant. Adolescents did not report a significant effect for overall family functioning.
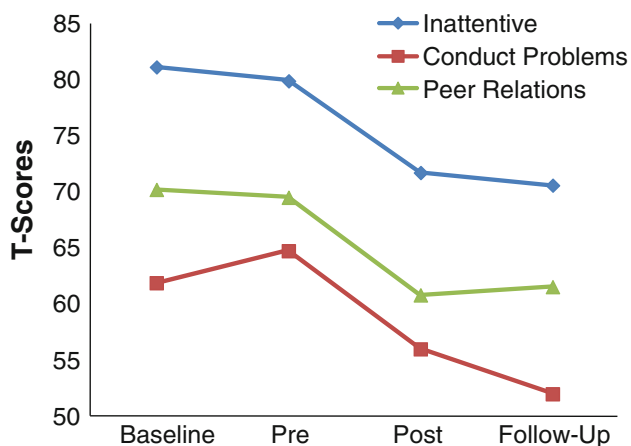
Mindfulness

We hypothesized that all participants would experience greater levels of mindfulness at post-test, compared to their pretest levels of mindfulness. Results of the repeated measures ANOVA for the Interpersonal Mindfulness in Parenting Scale indicated significant increases in overall

**Table 5** Results of repeated measures ANOVA and paired *t*-tests for parent and self report of adolescent symptoms

| Dependent variable | Overall model | | | | | Pairwise comparisons | | | | | | Follow-up | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | T1–T2 | | | T2–T3 | | | T3–T4 | | | |
| | n | Wilks' Λ | F | p | Partial η² | t | p | d | t | p | d | n | t(df) | p | d |
| ADHD symptoms | | | | | | | | | | | | | | | |
| P: Inattentive | 16 | .453 | 8.44 | .004 | .55 | 0.63 | 1.00 | .16 | 2.49 | .074 | .62 | 14 | 0.73 | .478 | .20 |
| P: H/I | 16 | .170 | 1.43 | .271 | .17 | | | | | | | 14 | 1.53 | .150 | .41 |
| A: Inattentive | 18 | .836 | 1.57 | .239 | .16 | | | | | | | 14 | 0.45 | .658 | .12 |
| A: H/I | 18 | .824 | 1.71 | .212 | .18 | | | | | | | 14 | 0.58 | .575 | .16 |
| Externalizing symptoms | | | | | | | | | | | | | | | |
| P: CD | 16 | .653 | 3.72 | .051 | .35 | −0.84 | 1.00 | −.21 | 2.80 | .040 | .70 | 14 | 1.21 | .248 | .32 |
| P: ODD | 16 | .854 | 1.19 | .332 | .15 | | | | | | | 14 | 1.68 | .118 | .45 |
| A: CD | 18 | .808 | 1.90 | .182 | .19 | | | | | | | 14 | 1.72 | .109 | .46 |
| A: ODD | 18 | .690 | 3.60 | .051 | .31 | 2.76 | .040 | .65 | −1.91 | .219 | −.45 | 14 | 0.78 | .451 | .21 |
| Internalizing symptoms | | | | | | | | | | | | | | | |
| P: Depression | 14 | .928 | 0.47 | .638 | .07 | | | | | | | 13 | 1.99 | .070 | .55 |
| P: Anxiety | 14 | .800 | 1.50 | .262 | .20 | | | | | | | 13 | 1.33 | .207 | .37 |
| P: Internalizing | 14 | .799 | 1.51 | .261 | .20 | | | | | | | 13 | 1.78 | .102 | .49 |
| A: Depression | 18 | .663 | 4.06 | .038 | .34 | 1.83 | .256 | .43 | 1.62 | .369 | .38 | 14 | 2.40 | .032 | .64 |
| A: Anxiety | 18 | .653 | 4.25 | .033 | .35 | 2.27 | .111 | .54 | 1.08 | .885 | .25 | 14 | 3.82 | .002 | 1.02 |
| A: Internalizing | 18 | .658 | 4.16 | .035 | .34 | 2.28 | .108 | .54 | 1.10 | .854 | .26 | 14 | 3.78 | .002 | 1.01 |
| Functional impairment | | | | | | | | | | | | | | | |
| P: Learning probs | 16 | .650 | 3.77 | .049 | .35 | 1.51 | .452 | .38 | 1.85 | .253 | .46 | 14 | 1.10 | .291 | .29 |
| P: Executive function | 16 | .517 | 6.53 | .010 | .48 | 1.78 | .286 | .45 | 1.42 | .527 | .36 | 14 | 0.90 | .386 | .24 |
| P: Peer relations | 16 | .415 | 9.86 | .002 | .56 | 0.54 | 1.00 | .14 | 4.28 | .002 | 1.07 | 14 | 0.09 | .928 | .02 |
| A: Learning probs | 17 | .748 | 2.53 | .113 | .25 | | | | | | | 14 | −2.38 | .815 | −.64 |
| A: Family relations | 18 | .623 | 4.84 | .023 | .38 | 3.13 | .018 | .74 | −1.43 | .509 | −.34 | 14 | 1.16 | .266 | .31 |

"P" denotes parental report, and "A" denotes adolescent self-report. "CD" denotes Conduct Disorder, and "ODD" denotes Oppositional Defiant Disorder. T1 denotes Time 1, or baseline; T2 denotes Time 2, or pre-test; T3 denotes Time 3, or post-test; and T4 denotes Time 4, or follow-up. Pairwise comparisons were only conducted when the overall ANOVA model was significant. Follow-up analyses are paired *t*-tests. Effect sizes reported for pairwise comparisons and follow-up paired *t*-tests are Cohen's *d*



**Fig. 1** Mean parent ratings of adolescent symptomatology at four time points

mindfulness in parents. Pairwise comparisons revealed that mindfulness remained stable during the baseline period, and significant change occurred between pre-test and post-test. Parents did not report changes in acceptance or experiential avoidance on the Acceptance and Action Questionnaire. Although significant time effects were reported by adolescents on the AAQ, post hoc tests revealed that the changes occurred only during the baseline period.

Post-hoc cross-lagged panel correlations were computed to explore the potential causal relationship between mindful parenting and parenting stress. In this design, correlations within and between both variables at pre-test and post-test were computed to determine the direction of association between them. A strong and significant negative association was found between mindful parenting at pre-test and total parenting stress at post-test, $r(14) = -.52$, $p = .020$. The relationship between parenting stress at pre-test and mindful parenting at post-test was small and non-significant, $r(14) = -.13$, $p = .311$. This suggests that higher levels of mindfulness in relation to the parenting role at pre-test predict lower levels of total parenting stress

**Table 6** Results of repeated measures ANOVA and paired *t*-tests for parenting stress

| Dependent variable | Overall model | | | | Pairwise comparisons | | | | | | Follow-up | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | | | T1–T2 | | | T2–T3 | | | T3–T4 | | |
| | Wilks' Λ | F(2,13) | p | Partial η² | t | p | d | t | p | d | t(13) | p | d |
| Total adolescent domain | .773 | 1.91 | .188 | .23 | | | | | | | .54 | .600 | .14 |
| Total parent domain | .842 | 1.22 | .328 | .16 | | | | | | | 3.81 | .002 | 1.02 |
| Ado-parent relationship | .714 | 2.60 | .112 | .29 | | | | | | | 1.57 | .140 | .42 |
| Total parenting stress | .824 | 1.39 | .285 | .18 | | | | | | | 3.02 | .010 | .81 |
| Life stressors | .924 | .53 | .599 | .08 | | | | | | | −.53 | .608 | −.14 |
| Adolescent domain scales | | | | | | | | | | | | | |
|   Moodiness | .961 | .26 | .772 | .04 | | | | | | | .02 | .982 | .01 |
|   Isolation/withdrawal | .607 | 4.21 | .039 | .39 | −1.32 | .627 | −.34 | 2.98 | .030 | .77 | 1.43 | .175 | .38 |
|   Delinquency/antisocial | .870 | .97 | .404 | .13 | | | | | | | .25 | .806 | .07 |
|   Failure to achieve | .611 | 4.15 | .041 | .39 | 1.44 | .517 | .37 | 2.13 | .153 | .55 | −.43 | .675 | −.11 |
| Parent domain scales | | | | | | | | | | | | | |
|   Life restrictions | .452 | 7.90 | .006 | .55 | 0.58 | 1.00 | .15 | 3.53 | .010 | .91 | 2.35 | .035 | .63 |
|   Social alienation | .963 | .25 | .785 | .04 | | | | | | | 1.64 | .125 | .44 |
|   Incompetence/guilt | .878 | .90 | .430 | .12 | | | | | | | .99 | .341 | .26 |

T1 denotes Time 1, or baseline; T2 denotes Time 2, or pre-test; T3 denotes Time 3, or post-test; and T4 denotes Time 4, or follow-up. Pairwise comparisons were only conducted when the overall ANOVA model was significant. Follow-up analyses are paired *t*-tests. Effect sizes reported for pairwise comparisons and follow-up paired *t*-tests are Cohen's *d*
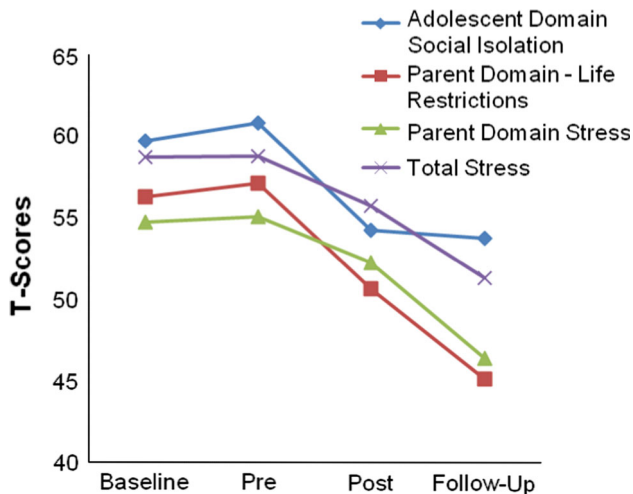


**Fig. 2** Parenting stress scores at four time points

at post-test. Since this pattern may be influenced by the presence of moderating variables, definitive statements of causality cannot be made.

Follow-Up

We predicted that treatment gains would be maintained for 6 weeks after completion of the intervention. We conducted paired samples t-tests to investigate whether significant changes occurred during the follow-up period

(between post-test and follow-up). As shown in Table 5, there were no significant changes in parent or adolescent reports of inattention, externalizing problems, or functional impairment at follow-up, indicating that gains achieved during the intervention were maintained (Fig. 1). Adolescents reported significant reductions in internalizing symptoms at follow-up, indicating that they experienced reductions in depression, anxiety, and total internalizing symptoms after the intervention ended. Although parents did not report significant changes in their adolescents' internalizing symptoms at follow-up, they reported reductions in depression that approached significance.

As shown in Table 6, parents reported significant reductions in several areas of parenting stress during the follow-up period, including parent domain stress and total parenting stress, indicating that they continued to experience benefits after the intervention ended. Trends for parenting stress across all time points are presented in Fig. 2.

As shown in Table 7, neither parents nor adolescents reported changes in amount or intensity of conflict at follow-up, although reductions in parent-reported conflict intensity approached significance. There was no significant change in general family functioning reported by parents or adolescents at follow-up.

Parents did not report significant changes in mindful parenting at follow-up, indicating that improvements in mindful parenting were maintained during the 6 week

**Table 7** Results of repeated measures ANOVA and paired *t*-tests for family functioning and mindfulness variables

| Dependent variable | Overall model | | | | | Pairwise comparisons | | | | | | Follow-up | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | T1–T2 | | | T2–T3 | | | T3–T4 | | | |
| | n | Wilks' Λ | F | $p$ | Partial $\eta^2$ | $t$ | $p$ | $d$ | $t$ | $p$ | $d$ | n | $t$ | $p$ | $d$ |
| P: Family functioning | 15 | .616 | 4.06 | .043 | .38 | 1.75 | .313 | .45 | 1.83 | .267 | .47 | 13 | −1.10 | .292 | .31 |
| A: Family functioning | 18 | .778 | 2.28 | .134 | .22 | | | | | | | 14 | .483 | .637 | .13 |
| P: No. of conflicts | 16 | .813 | 1.61 | .235 | .19 | | | | | | | 14 | 1.06 | .308 | .28 |
| A: No. of conflicts | 18 | .815 | 1.82 | .194 | .19 | | | | | | | 14 | .70 | .497 | .19 |
| P: Conflict intensity | 13 | .902 | 0.59 | .569 | .10 | | | | | | | 11 | 1.99 | .074 | .60 |
| A: Conflict intensity | 16 | .576 | 5.16 | .021 | .42 | 2.18 | .139 | .54 | −2.24 | .122 | −.56 | 10 | 1.62 | .140 | .51 |
| Mindful parenting | 15 | .572 | 4.86 | .027 | .43 | 2.13 | .152 | .55 | −3.17 | .021 | −.82 | 12 | 1.69 | .120 | .49 |
| Parent acceptance | 15 | .779 | 1.85 | .197 | .22 | | | | | | | 13 | 2.56 | .025 | .71 |
| Adolescent acceptance | 18 | .675 | 3.85 | .043 | .33 | 2.77 | .040 | .65 | .35 | 1.00 | .08 | 14 | 1.30 | .217 | .35 |

T1 denotes Time 1, or baseline; T2 denotes Time 2, or pre-test; T3 denotes Time 3, or post-test; and T4 denotes Time 4, or follow-up. Pairwise comparisons were only conducted when the overall ANOVA model was significant. Follow-up analyses are paired *t*-tests. Effect sizes reported for pairwise comparisons and follow-up paired *t*-tests are Cohen's *d*

period after the intervention ended. Parents reported significant increases in acceptance and decreases in avoidance at follow-up, suggesting that they continued to experience increases in mindfulness after the intervention ended. Adolescents did not report significant changes in mindfulness at follow-up.

## Discussion

Overall, results of the current study support and extend the preliminary findings of previous investigations of MYmind that showed it to be a promising treatment. MYmind was associated with reductions in adolescent inattentiveness and conduct problems, improvements in adolescent peer relations, reductions in parenting stress, and increases in parental mindfulness. The addition of a month-long baseline period allowed for the differentiation of treatment effects from those that might have occurred due to placebo or maturation. This independently conducted treatment evaluation demonstrated that MYmind is feasible in cross-cultural contexts, and shows promise as an alternative or complementary treatment option for adolescents with ADHD and their parents.

The current study provided further evidence to support the preliminary evaluations of MYmind with respect to improved attention. Parents reported near significant improvements in inattention at post-test compared to pre-test. Although the pairwise comparison did not reach significance ($p = .07$), the effect size was in the medium to large range ($d = .62$). It is possible that a larger sample size would have garnered significant results. Improvements in inattention were maintained at follow-up. This is notable given the chronic course of ADHD. Parents did not report

significant change in hyperactivity/impulsivity, and adolescents did not report changes in either domain. Despite the literature suggesting that hyperactive/impulsive symptoms decline in adolescence (Barkley, 2004), the current sample demonstrated clinically elevated levels of hyperactivity/impulsivity at intake; the lack of change in this domain is not due to floor effects. This suggests that the intervention targets attention related processes more so than hyperactive symptoms. These results are somewhat consistent with previous evaluations of MYmind for adolescents, which reported improvements in father report of inattention (van de Weijer-Bergsma et al. 2012), adolescent report of inattention, and objective measures of visual attention (Bogels et al. 2008).

The hypothesis that adolescents would exhibit reductions in comorbid externalizing difficulties was partially supported. Parents reported significant reductions in conduct problems between pre-test and post-test, with a medium to large effect size ($d = .70$). Adolescents did not report significant changes in externalizing symptoms during the intervention. Interestingly, clinical change was evident even where statistical significance was not (e.g., approximately 24 % of adolescents moved from the clinical to the subclinical range in terms of ODD symptoms during the intervention period). These results are consistent with previous quasi-experimental evaluations of mindfulness interventions for children and adolescents with ADHD, which reported reductions in parent-rated externalizing problems (Haydicky et al. 2012; Singh et al. 2010).

Parental report partially confirmed the hypothesis that adolescents would experience a reduction in functional impairment after the intervention. Adolescents exhibited large ($d = 1.07$) and significant reductions in peer relations

problems at post-test, compared to pretest. The intervention effects were maintained at follow-up. This is notable considering the limited efficacy of social skills training for youth with ADHD (Chronis et al. 2006). Results of the current study are similar to those reported by Haydicky et al. (2012), suggesting that adolescents with ADHD demonstrate reductions in peer relations problems after MBCT. These results are clinically relevant, as children with externalizing behaviour problems such as ADHD are more likely to be rejected by peers, and this rejection can exacerbate externalizing problems, as well as contribute to the development of internalizing problems (Deater-Deckard, 2001). An intervention that reduces peer relational problems may serve as a protective factor, and reduce the risk of psychopathology amongst adolescents with ADHD (Deater-Deckard 2001).

Remarkable reductions in functional impairment are evident when clinical status is evaluated. As shown in Table 1, after only 8 weeks of treatment, between 24 and 35 % of adolescents who originally displayed clinically significant learning, EF, and peer relations problems at pretest fell below the clinical cut-off at post-test. The robust treatment effects of the current study may be due, in part, to the involvement of parents, as there is some evidence to suggest that greater improvements occur when parent training is added to child training (Chronis et al. 2006).

Although there were no significant changes in internalizing symptoms at post-test, adolescents reported significant reductions in depression, anxiety, and total internalizing problems at 6 week follow-up. These effects were medium to large ($d = .64$ for depression; 1.02 for anxiety; and 1.01 for total internalizing problems). After the intervention ended, participants continued to receive daily reflection questions and reminders for several weeks, which may have encouraged the continuation of mindful practice and consolidation of concepts learned during the intervention. It is possible that it takes both time and practice with mindfulness meditation for the effect of treatment on anxiety and depression to reach a level that adolescents can detect. Results of previous evaluations of MYmind are inconsistent with regard to internalizing problems (Bogels et al. 2008; van de Weijer-Bergsma et al. 2012). Results of the current study suggest that MBCT may be helpful for reducing depression and anxiety among adolescents with ADHD, but further research is needed to separate true treatment effects from those attributable to maturation, placebo, or other factors.

Consistent with studies of parents of children with developmental disabilities (Blackledge and Hayes 2006; Singh et al. 2006; Duncan 2007), and similar to results reported by van de Weijer-Bergsma et al. (2012) concerning fathers of adolescents with ADHD, parents in the current study experienced significant reductions in parenting stress

at post-test compared to pretest levels. They felt less stress related to their adolescent's social isolation ($d = .77$), which may be associated with parental report of improved functional impairment in the social domain. They also felt less stress related to restrictions caused by their role as a parent ($d = .91$). As shown in Table 3, reductions in the proportion of parents experiencing clinical levels of stress from pretest to post-test in these subdomains as well as in total stress and stress in the adolescent domain were substantial. Parents continued to experience large and significant reductions in total parent domain ($d = 1.02$) and total stress ($d = .81$) after the intervention ended, suggesting that mindfulness continued to exert an influence even after formal mindfulness training ended.

Parents reported significant increases in mindful parenting during the intervention period, representing improved present-centered awareness and non-judgmental acceptance of their children, as well as less reactivity to their child's behaviour. These gains were maintained at follow-up. Although parents did not report changes in acceptance or experiential avoidance at post-test, they did report significant improvements at follow-up. This indicates that continued practice and time may have allowed parents to cultivate a more mindful orientation. Mindful parenting involves thoughtful, intentional responding rather than automatic reacting in challenging situations. This may lead to decreased conflict, less anger, and improved communication between parents and adolescents. Despite non-significant findings in the domain of family functioning and conflict in the current study, a qualitative evaluation of MYmind (reported elsewhere) indicates that parents who adopted a mindful approach to parenting experienced improved relationships with their children. Previous evaluations of MYmind did not measure mindful parenting. Furthermore, higher levels of mindful parenting at pre-test were associated with lower levels of total parenting stress at post-test. This suggests that adopting a mindful orientation towards one's role as a parent may reduce the stress associated with raising a child with ADHD. Since this pattern may be influenced by the presence of moderating variables, further investigation with a larger sample is needed before definitive statements of causality can be made.

MYmind did not appear to be associated with meaningful changes at post-test in several areas of functioning, including adolescent anxiety and depression, parent–child conflict, and family functioning. There are several possible reasons why our hypotheses were not supported in these areas.

First, with regard to anxiety and depression, the pattern of scores indicates that these internalizing symptoms decreased gradually from baseline through post-test and follow-up. This suggests that improvements were due to other external (e.g., changes at school) or internal (e.g.,

maturation) factors. However, it is possible that the study procedures may have influenced the adolescents' reports. At baseline, they attended a meeting with a facilitator to discuss motivation, commitment, and personal goals for the program. These meetings may have increased readiness for change and contributed to expectancy effects. Additionally, all participants received daily emails with questions to stimulate self-reflection during the baseline period (e.g., how much distress they experienced as a result of interactions with their parents) that may have increased self-awareness during the baseline period, contributed to symptom reduction, and served as a foundation for mindfulness training during the intervention and follow-up period.

Second, participants reported subclinical levels of internalizing problems and conflict intensity on average at baseline, indicating that families were experiencing minimal impairment in these domains before the intervention started. As such, there was little room for improvement.

Third, it is possible that some of the measures were not sufficiently sensitive to changes that occurred. The questionnaire used to measure family functioning (FAD), for example, required participants to rate their functioning in several domains on a 4-point scale. This scale may not have captured subtle changes occurring as a result of mindfulness training. The questionnaire used to measure adolescent mindfulness (AAQ), was not developed specifically for children or adolescents. It is possible that results would have been different had we selected a global measure of mindfulness validated for use with adolescents.

Fourth, the treatment was short (eight 90 min sessions). Changes in longstanding patterns of interpersonal relatedness may require a longer intervention or joint, rather than concurrent, parent-adolescents sessions. Results of qualitative interviews with MYmind participants (reported elsewhere) suggest that families were becoming more aware of their automatic reactions, and were making efforts to respond mindfully during conflict. Analyses of parent and adolescent ratings on the FAD indicate that, although there was no statistically significant change, some degree of change may have occurred across the intervention period. Family functioning as rated by parents and adolescents was within the clinical range prior to the intervention, and ratings fell into the non-clinical range after the intervention. This suggests that, with more time, families may have experienced greater and more meaningful improvements in family functioning.

In general, changes in functioning associated with MYmind were evident on parent-report measures but were not reported by the adolescents themselves. Unexpectedly, adolescents reported improvements during the baseline period but not after the intervention. As previously discussed, daily email questionnaires may have stimulated self-

reflection and contributed to a more mindful orientation, thus indirectly influencing behaviour during the baseline period. The discrepancy between parent and adolescent ratings of ADHD and externalizing symptoms may be partially explained by the positive illusory bias (PIB). The PIB refers to the tendency of children and adolescents with ADHD to overestimate their competence and underestimate their difficulties relative to parent, teacher and objective ratings (Hoza et al. 2010; Owens et al. 2007). Since parent reports are typically on par with teacher ratings and objective tasks (Owens et al. 2007), parents are considered more reliable raters of adolescent externalizing behaviour than the adolescents themselves. The consistent pattern of adolescent under-reporting of externalizing symptoms and functional impairment at baseline, compared to parent ratings of the same constructs, suggests that the PIB was present in the current sample (see Table 1). As such, lack of significant improvements in adolescent self-reports at post-test may be explained by their biased ratings at baseline. It is also possible that MYmind stimulated changes in parental perceptions of their adolescents, rather than true behavioural change in the adolescents themselves. As parenting stress decreased, and acceptance increased, parents may have viewed their adolescent's behavior in a new light. Released from judgment, rumination, and recrimination, parents may have been able to observe and respond to "challenging" behavior from a more objective, present-moment perspective (e.g., "this behavior is what it is, and it will pass," as opposed to "he's being defiant again"). Changes in parental perceptions at the end of the intervention may have been reflected in lower ratings of adolescent problems on post-test questionnaires.

It is important to note that outcomes in the current study were based primarily on maternal report. Of the thirteen fathers eligible to participate in the intervention, close to half (46 %, or six) participated in the program to some extent, although they were not, for the most part, eligible for inclusion in data analyses. The other half did not enroll in the program. Little is known about father involvement in parent-based treatments for ADHD, because fathers are often not included in outcome studies (Chronis et al. 2004). Fabiano (2007) suggests that father involvement may improve child outcome and help sustain changes, although very few studies have directly compared outcomes of interventions involving fathers to those involving mothers. A comparison of standard parent behavioural training for fathers only, and an adapted version for fathers involving interactive sports activities, revealed similar child outcomes in both conditions. However, there was significantly greater attendance, homework completion, and satisfaction with the intervention among fathers who attended the sports-based program (Fabiano et al. 2009). This suggests that adapting parenting programs for fathers increases

engagement and retention, which is critical given the traditionally low adherence to parent behavioural training (Fabiano 2007; Fabiano et al. 2009). Fabiano (2007) identified individual and structural barriers to father involvement, including paternal ADHD, the format of parent training (e.g., didactic learning), inflexible scheduling, and content applicable to parenting responsibilities typically assumed by mothers (e.g., caregiving rather than recreational sports). Fathers are less likely than mothers to believe their parenting skills are in need of intervention, and thus may be less likely to enroll in programs that aim to remediate skills deficits (Fabiano 2007). MYmind may reduce some of the barriers associated with typical parent training programs. For example, the experiential format of parent groups is engaging and the content is discussion-driven, allowing parents to explore the applications of mindfulness to their current parenting practices. Group facilitators adopt an accepting and non-judgmental stance, which encourages participation from all parents regardless of the role they play in their families. This may reduce stigma and increase a sense of belonging among fathers. The regular mindfulness practice may also ameliorate some of the ADHD symptoms experienced by fathers, allowing them to participate more fully in the program. Indeed, van de Weijer-Bergsma et al.'s (2012) evaluation of MYmind for adolescents with ADHD indicated that equal numbers of fathers and mothers participated, suggesting that the format of the group was amenable to fathers. What's more, fathers (but not mothers) experienced significant reductions in parenting stress after the intervention. Future studies should attempt to recruit more fathers and include analyses of paternal report to measure engagement, retention, and outcome among fathers participating in MYmind.

Despite the promising results, the current study had several limitations. The small sample and lack of randomized control group made it difficult to assess the representativeness and generalizability of results. Although the sample of 18 adolescents was larger than previous evaluations of MYmind, it was not large enough to conduct subgroup analyses. Thus, we were unable to compare boys versus girls, younger versus older teens, or examine the differential effects for adolescents concurrently taking medication. However, attempts were made to separate general time effects from treatment effects by adding a baseline period of treatment as usual, and conducting a multiple baseline time series study (reported elsewhere). Parent ratings of adolescent symptoms, parenting stress, mindfulness, and family functioning remained stable during the baseline period, and improvements occurred after the intervention was implemented. Another limitation of the study is reliance on self-and parent-report data. Given the tendency of youth with ADHD to underestimate their behavioural problems, observational or performance-based measures may have more accurately captured treatment effects. Furthermore, parents were highly involved in the intervention and invested in the outcome; thus, they may have been more likely to report positive changes. Despite the promising results and large effect sizes, the current study does not provide information about MYmind's efficacy relative to other treatments, nor does it parse out the relative contribution of parent versus adolescent training. Nevertheless, the results suggest that MYmind is a promising alternative or complementary intervention for adolescents with ADHD and their parents. Therefore, the logical next step is to conduct a large, multi-site randomized control trial of MYmind.

The treatment effects in the current study are large and meaningful. Effect sizes of significant ANOVA models were large, with partial eta$^2$ values ranging from 0.34 to 0.55 (Green and Salkind 2008). Significant pre-post changes were also associated with medium to large effect sizes, with Cohen's $d$ values ranging from 0.62 to 1.07. This is consistent with the large effect sizes reported by Bogels et al. (2008) and the small to large effect sizes reported by van de Weijer-Bergsma et al. (2012). Effect sizes of this magnitude are on par with, or larger than, those reported for cognitive interventions (Toplak et al. 2008), behavioural parent training (Chronis, Jones and Raggi 2006), and combined treatments using medication and psychosocial approaches (Majewicz-Hefley and Carlson 2007). Furthermore, indices of clinical significance suggest that youth impairment was substantially reduced after the intervention.

These findings are notable in light of the complexity and severity of the sample. Over three quarters (78 %) of the adolescents had a comorbid disorder that they were aware of, and many of them were experiencing significant functional impairment such as school failure and suicidal ideation. Prior to enrolling in mindfulness training, 50 % of the families had attempted another behavioural intervention and 61 % had attempted family therapy, with little amelioration of distress. These families reported feeling overwhelmed, hopeless, and desperate. Nevertheless, many parents expressed high levels of readiness to try alternative approaches such as mindfulness. Remarkably, only 8 weeks of mindfulness training produced changes in adolescent inattentiveness, conduct problems and peer relations, and aspects of parenting stress and mindfulness. Furthermore, these treatment gains were maintained or improved upon after the intervention ended.

Perhaps one of the reasons for the success of the program was the fact that it involved concurrent parent and adolescent training. By attending weekly sessions and completing their homework, parents acknowledged that they have an important role to play in improving family functioning. The focus shifted away from the adolescent as the "identified patient" and expanded to encompass the

family as a whole. This tacit understanding validated the adolescent's role as an autonomous but connected member of the family unit. Throughout the intervention, parents were encouraged to model mindfulness techniques and reinforce concepts at home, thus enhancing their children's adherence to the program and promoting generalization. The parent training component of the program emphasized non-judgmental acceptance of youth as they are, which may have altered parental perceptions of their children's problem behaviours.

Clinicians provided support between sessions via daily emails and text messages. In addition to serving a research purpose, the emails functioned as mindful check-ins during the week, prompting participants to reflect on their daily intra- and inter-personal experiences. Although they were not part of the manualized treatment program, the electronic communication may have contributed to therapeutic effects. Motivation enhancement was added to the fourth and eight sessions in the form of reflections, goal-setting, and action plans for maintaining mindfulness practice. The very low attrition rate reflects the high level of commitment to the program. Of the 20 adolescents who initially enrolled in the study, one adolescent dropped out in order to attend camp, and one adolescent dropped out due to mental health concerns. Only one mother and two fathers did not complete the intervention due to scheduling conflicts. Considering the extremely low adherence rates to medication, the retention rates of MYmind attest to its feasibility and acceptability to adolescents as a viable treatment option for ADHD.

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