MINDFULNESS TRAINING FOR ADOLESCENTS WITH ADHD AND THEIR FAMILIES: A TIME-SERIES EVALUATION

by

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Abstract

The present study involved an extension and evaluation of a mindfulness-based training program for families of adolescents with Attention-Deficit/Hyperactivity Disorder (ADHD). MYmind: Mindfulness training for Youth with ADHD and their parents (Bogels et al., 2008) is an eight-week manualized treatment incorporating elements of mindfulness meditation, ADHD psychoeducation and cognitive behavioural therapy. MYmind focuses on helping families cultivate mindfulness through training in formal meditation practices and integrating this skill into the context of everyday life as a means of managing ADHD symptoms, stress, family relations and difficult emotions. A North American sample of 13 parents and 9 adolescents (ages 13-18) participated in MYmind; during the intervention, parents and adolescents attended separate groups that ran simultaneously. Using a time-series multiple baseline design, constructs of stress, distress from family conflict, ADHD symptomatology and meditation practice were measured via short questionnaires emailed daily to both parents and adolescents throughout baseline, treatment and six months of follow-up. For multiple baseline purposes, intervention was introduced in a time-lagged fashion. Results from parent and adolescent reports indicated
reductions in parent and adolescent stress, parent and adolescent distress due to family conflict, and increased frequency and duration of meditation practice. Parent reports suggested a decrease in their adolescents’ inattention, hyperactivity and impulsivity symptoms after participating in MYmind, a reduction that was not confirmed by adolescent reports. Most treatment gains were maintained up to six-months following treatment completion. Meditation practice was significantly correlated with reduced stress levels for both groups. Both parents and adolescents reported high satisfaction with the MYmind program overall. Mindfulness training appears to hold considerable potential for improving the multiple difficulties experienced by adolescents with ADHD and their parents.
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Chapter 1: Introduction

The present study is an investigation of a mindfulness-based treatment for adolescents with ADHD and their parents. This intervention was designed to target the conflict and high stress levels commonly found in these families, as well as the ADHD symptoms of the adolescents. In this chapter, I will provide a context for the current difficulties faced by families with an adolescent with ADHD and consider the relevance of mindfulness for treating these difficulties. First, the symptoms, underlying mechanisms, and interventions currently available for ADHD will be reviewed. This will be followed by a discussion of the high rates of conflict in families of adolescents with ADHD and a consideration of the high stress levels associated with parenting these youth. Subsequently, I will review empirically supported treatments used to target family conflict and stress, and consider the potential for mindfulness as an alternative to the currently available interventions. Empirical studies supporting mindfulness as a treatment for conflict, stress and ADHD will be presented as a rationale for the present investigation.

1.1 ADHD Symptomatology

ADHD is a neurobiologically-based disorder characterized by symptoms of inattention, impulsivity and hyperactivity, which cause impairment in multiple settings and are atypical for the person’s level of development. Estimates indicate that ADHD affects 5–10% of school-aged children (Polanczyk & Jensen, 2008; Polanczyk, de Lima, Horta, Biederman, & Rohde, 2007), and more than 5% of adolescents (Polanczyk et al., 2007). Compared to other youth, those with ADHD have difficulty with arousal,
motivation, planning and pursuing goal-directed behaviours, and adapting their behaviour in response to the changing demands of different situations (Mercugliano, Power, & Blum, 1999; Nigg & Casey, 2005).

Various potential underlying mechanisms have been proposed to explain the behavioural symptoms and functional difficulties involved in ADHD. ADHD has been associated with neurological deficits and structural and functional brain alterations, resulting in impaired executive functions, including working memory, attention regulation and inhibition (Bush, Valera, & Seidman, 2005; Seidman, 2006; Desman, Petermann, & Hampel, 2008; Ma et al., 2012; Wåhlstedt, Thorell, & Bohlin, 2008). In a meta-analytic review of 83 studies examining executive functioning in samples with ADHD, Willcutt, Doyle, Nigg, Faraone, and Pennington (2005) concluded that compromised executive functioning should be considered a leading cause of the impairments associated with ADHD.

Barkley’s (1997) model suggests that the primary deficit in ADHD is the specific executive function of behavioural inhibition. The inability to inhibit responses is associated with increased emotional reactivity, trouble dealing with frustration/anger, and increased difficulty self-regulating one’s emotions (Friedman et al., 2003; Nigg, 2001). Multiple studies have demonstrated that the brain regions producing the inhibition function are underactive in ADHD participants, causing them to struggle during tasks that require an inhibitory response and leading to core ADHD symptoms of inattention and/or impulsiveness (Mulligan et al., 2011; Smith et al. 2006; Tamm, Menon, Ringel, & Reiss, 2004). Furthermore, children with ADHD appear to have abnormal parasympathetic mechanisms involved in emotion regulation, resulting in difficulty with regulating affect
and suppressing emotional expression (Musser et al., 2011).

Walcott and Landau (2004) investigated cognitive disinhibition and emotion regulation in a sample of 49 boys aged 6-11 with and without ADHD. Cognitive disinhibition was measured via Stop Signal Reaction Time (i.e., a measure of how much time is needed to successfully inhibit a motor response). Emotion regulation was examined with a puzzle task in which two pieces were missing and children were required to respond faster than a confederate. In addition, half of the children were asked to mask their frustration from the confederate competitor. Results showed that boys with ADHD exhibited less effective emotion regulation than boys without ADHD, demonstrated by more negative responses and immobilized behaviour. They also had more difficulty regulating their emotional expression when instructed.

In samples of preschoolers, both Schoemaker, Bunte, Wiebe, Espy, Deković, and Matthys (2012), and Thorell and Wahlstedt (2006) found that children with ADHD showed significant inhibition and working memory deficits, even after controlling for IQ (i.e., in the Schoemaker study). Both research teams also demonstrated that although ADHD is commonly comorbid with Oppositional Defiant Disorder (ODD), poor executive functioning in preschoolers appeared to be mainly associated with symptoms of ADHD, whereas the relation to symptoms of ODD can be attributed to the great overlap between the disorders. These executive function impairments seen in preschoolers and children with ADHD appear to persist into adolescence. Martel, Nikolas, and Nigg (2011) compared adolescents diagnosed with ADHD to a control group across a multistage diagnostic assessment. Results revealed that after controlling for age, IQ, comorbid disorders and gender, adolescents with ADHD performed significantly worse
than the controls on executive function measures. Similar to prior research (Barkley, 2003), Martel et al. concluded that children and adolescents exhibit a similar pattern of executive functioning deficits suggesting similar clinical impairments across development.

As a result of the aforementioned executive functioning and regulation difficulties, adolescents with ADHD often encounter challenges in many life situations. For example, in comparison to adolescents without ADHD, those with ADHD are at increased risk for significant academic impairment, including lower grade point averages (GPA), lower levels of class placement, school failure and dropout (Ek, Westerlund, Holmberg, & Fernell, 2011; Rogers, Hwang, Toplak, Weiss & Tannock, 2011). Furthermore, adolescents with ADHD complete significantly less class assignments and are significantly less likely to achieve their potential (Ek et al., 2011; Kent et al., 2011). These youth also struggle in relationships as adolescents with ADHD have significantly fewer close friendships and greater peer rejection compared to non-ADHD peers (Bagwell, Molina, Pelham, & Hoza, 2001). Adolescents with ADHD are also at an increased risk to become involved in deviant peer groups, and because they are more vulnerable to negative social influences of that group, are more likely to use illegal substances (Marshal, Molina, & Pelham, 2003). In addition to substance use, adolescents with ADHD are also more likely to engage in reckless driving (Thompson, Molino, Pelham & Gnangy, 2007), risky sexual behaviour (Flory et al., 2006) and criminal activities (Fletcher & Wolfe, 2009).

As demonstrated by the above research, youth with ADHD are unable to modulate their emotions and control their behaviour according to the requirements of the
situation, whether these are demands placed on them by parents at home, teachers at school or peers within social contexts (Barkley, 1990). Many of these adolescents experience a progressive decline in their self-concept and academic performance, despite normal intelligence (Dupaul et al., 2004; Frazier, Youngstrom, Glutting, & Watkins, 2007; Hinshaw, Owens, Sami, & Fargeon, 2006; Kawabata, Tseng, & Gau, 2012; Mannuzza & Klein, 2000). Due to impaired ability to interpret and control their emotions and behaviours, youth with ADHD often manage stressful situations with avoidance and aggression (Hampel, Manhal, Roos, & Desman, 2008). Consequently, they may begin to believe that academic, social, and familial problems are beyond their control (Erk, 2000), resulting in additional emotional and behavioural difficulties, such as social or academic withdrawal, anger, and low self-esteem.

1.2 ADHD Treatments

Based on the results of many randomized clinical trials, the most effective form of treatment for ADHD is currently medication (Biederman & Farone, 2005; Connor, 2005; Hechtman & Greenfield, 2003). However, multiple negative side-effects of pharmacological intervention have been reported, including reduced growth, delayed sleep onset, reduced appetite, abdominal pain, weight loss, tics, jitteriness, and headaches (Lerner & Wigal, 2007; MTA Cooperative Group, 2004a; Schachter, Pham, King, Langford, & Moher, 2001; Wolraich, McGuinn, & Doffing, 2007). Given these potential side effects, many parents prefer their children to participate in psychosocial treatment approaches, such as group therapy, social skills training, behaviour management, parent education, and school-based interventions (Farmer, Compton, Burns, & Robertson, 2002;
Notwithstanding this preference, psychosocial interventions have not yet been demonstrated to produce effects comparable to medication. For example, when a methylphenidate (MPH) plus multimodal psychosocial treatment, including parent training, social skills training and academic remediation was compared to a MPH alone group, assessments from multiple sources yielded no evidence of additional efficacy for the combined intervention over the MPH alone (Abikoff et al., 2004). Moreover, all participants in the multimodal group deteriorated when medication was replaced with a placebo. Another multi-site study conducted by the MTA Cooperative Group (2004a) found similar results; the multimodal combination of MPH and behaviour therapy was not significantly more effective than medication alone. Furthermore, MPH alone and MPH combined with behaviour therapy were superior to behaviour therapy alone or community care alone (treatment as usual) during an observational follow-up period of 24 months (MTA Group, 2004b). However, a subsequent follow-up analysis, extending over 36 months, revealed an increased incidence of symptoms in the combined treatment group (Swanson et al., 2008).

Although the MTA Cooperative Group concluded that treatments involving medication were more effective than the conditions that did not, there are further considerations. For example, there were some large differences in the medication doses across treatment groups. Specifically, at the 14-month follow-up, the average daily dose for participants in the combined group was 31.2 mg while the average daily dose for the MPH alone group was 37.7 mg (MTA Cooperative Group, 1999a). Another concern in comparing the behavioural treatment and combined conditions with MPH alone is that
intensive behavioural treatments were faded by study termination, whereas medication
continued (Pelham, 1999). Because of this disproportionate treatment activity, it is
possible that the comparison of the behaviour therapy and combined conditions to the
MPH alone at the 14-month follow-up point may have been biased in favour of the MPH
alone group. Therefore, the extent to which medication alone is superior to combined or
psychosocial treatments alone has not been categorically determined.

School-based studies have also investigated the single, comparative and combined
effects of pharmacological and behavioural treatments with children with ADHD
(Pelham et al., 2005). For example, Fabiano et al. (2007) examined different levels of
behaviour modification alone (no BMOD, low or high intensity BMOD), different doses
of MPH alone (placebo, 0.15, 0.30 and 0.60 mg) and the treatments combined in an
analogue classroom with 48 ADHD children. Results revealed that a low level of BMOD
in combination with medication was typically as effective in improving classroom
behaviour, productivity and teacher rated ADHD symptoms as a high level of BMOD
with medication. The 0.15 mg dose of MPH was just as effective as the 0.30 mg dose
when combined with a low level of BMOD and these were both more effective than
either of these doses alone, however, a 0.60 mg dose of MPH alone was just as effective
as the combined treatments. Moreover, these treatments took place in an analogue
classroom as part of a summer treatment program; this setting did not approximate the
workload or enrolment numbers of a typical classroom. Also, given the lack of follow-up
data in this study, there was no consideration of maintenance of effects.

Given the negative side-effects of ADHD medication, a lack of evidence for long-
term effects (Goldman, Genel, Bezman, & Slanetz, 1998; Vitiello, 2001), and decreased
compliance to medication regimens in adolescence (Atzori, Usala, Carucci, Danjou, & Zuddas, 2009; Jensen et al., 2007), an alternative approach to treating ADHD is needed. Moreover, a treatment with the potential to alleviate the difficulties associated with ADHD (e.g., inattention, behaviour inhibition, emotion regulation, etc.) would be particularly beneficial for adolescents with this disorder, considering the level of challenge they experience in a variety of contexts, in a range of important skills areas, and in their interactions with important others (e.g., parents, teachers, peers).

1.3 Parent-Child Conflict in Families with ADHD

Many significant life changes occur during the developmental transition that takes place when children enter adolescence. The initiation of secondary school coincides with numerous shifts in physical, social and cognitive functioning (Steinberg, 2001). Managing the personal, academic and social pressures that parallel these life changes is difficult, not just for adolescents, but also for their parents. For example, the attempts of adolescents to explore their identity and gain autonomy may clash with their parents’ ideas and willingness to allow independence (Jackson, Bijstra, Oostra, & Bosma, 1998; Spring, Rosen, & Matheson, 2002). This discord may lead to emotional arousal and conflict between parents and adolescents, which can trigger negative patterns of interaction (Granic, Dishion, & Hollenstein, 2003).

Although some parent-adolescent conflict is developmentally appropriate, high levels of conflict are associated with poorer psychological adjustment in adolescents and parents (Shek, 1998; Dekovic, 1999). For example, a longitudinal study (Shek, 1998) found that parent-adolescent conflict was associated with more psychiatric symptoms,
lower self-esteem, and a lack of sense of purpose in adolescents one year later. According to Robin (1981), parent-adolescent conflict is frequently a consequence of deficits in interpersonal and problem-solving skills in both parties, as well as parents’ and adolescents’ distorted or irrational beliefs about their own or one another’s behaviour. This combination of deficits may result in discordant parent-adolescent interactional patterns, especially when adolescents have difficulties with inhibitory processing and emotional regulation, as is found in youth with ADHD (Wolraich et. al., 2005).

Although adolescence is typically a time of increased parent-child conflict (Laursen, Coy, & Collins, 1998), families with an adolescent with ADHD demonstrate especially high levels of discord (Babinski et al., 2011; Barkley, Anastopoulos, Guevremont, & Fletcher, 1992; Lange et al., 2005; Pressman et al. 2006). In two independent studies (Fletcher, Fischel, Barkley, & Smallish, 1996; Wymbs & Pelham, 2010), adolescents with ADHD and behaviour problems, and their parents, exhibited higher levels of conflict-related behaviour, such as defensiveness, insults, negative affect and commands during discussions than adolescents and parents in a control group. These families report arguing about more issues, feeling more anger, and using more negative communication than families without an adolescent with ADHD (Edwards, Barkley, Laneri, Fletcher, & Meteivia, 2001).

Schroeder and Kelley (2009) investigated the relationship between ADHD symptoms (executive functioning difficulties) and family conflict among 134 parents of children with and without ADHD. Parents of children with ADHD reported higher levels of family conflict and less organization in the home. Relational difficulties may be further exacerbated by symptoms of ODD or Conduct Disorder that are found in up to 75% of
adolescents with ADHD (Wolraich et. al., 2005). Biederman, Mick, Faraone, and Burback (2001) conducted a four-year longitudinal study of 140 children with ADHD, who were divided into those with persistent or remitting/desistent Conduct Disorder. Findings indicated that children with persisting conduct problems had greater levels of family conflict and less family cohesion at baseline. Moreover, child-reported problems with parents at baseline significantly predicted continual conduct problems in adolescence.

The aversive interactions between parents and their adolescents with ADHD appear to be reciprocal in nature (Burke, Pardini, & Loeber, 2008; Hinshaw, 2000). According to Mash and Johnston (1990), “both parents and children are victims as well as architects of conflicted relationships” (p. 314). It may be more difficult to parent youth with ADHD (especially when they demonstrate increased oppositional behaviours), but studies show that parenting attitudes and practices, whether hostile or warm, impact the behaviours of their children with ADHD (Anderson, Hinshaw & Simmel, 1994). For example, Hinshaw et al. (1997) found that the strongest predictor of prosocial skills among boys with ADHD was the degree to which their mothers exhibited an authoritative (warm, limit setting, encouraging autonomy) parenting style. However, parents of children with ADHD have been shown to use more negative and fewer positive parenting practices than parents of children without ADHD (Gerdes, Hoza, & Pelham, 2003; Johnston, 1996).

When interacting with their children, parents of children with ADHD are less responsive and more over-reactive (Barkley, Fischer, Edelbrock, & Smallish, 1991; DuPaul, McGoe, Eckert, & Vanbrakle, 2001; Ellis & Niggs, 2009). They often avoid dealing with difficult situations altogether (Goldstein et al., 2007) and show less parental
support than parents of typical children (Khamis, 2006). In families that include children with ADHD and externalizing problems, there are higher levels of parental conflict, negative parenting practices and poorer social support (Kaiser, McBurnett, & Pheiffer, 2011; McLaughlin & Harrison, 2006). Many parents of children with ADHD have ADHD symptoms themselves, and consequently may lack the skills necessary to resolve conflict (Mokrova, O'Brien, Calkins, & Keane, 2010).

1.4 Treatments for Parent-Child Conflict

The increased recognition of the parent-child conflict that is associated with ADHD and the added obstacles to resolution, such as child behaviour problems, has led to the development of programs targeting these issues in families with ADHD (Gerdes, Haack, & Schneider, 2012; Mikami, Jack, Emeh, & Stephens, 2010; van den Hoofdakker et al., 2007; for a review see Zwi, Jones, Thorgaard, York, & Dennis, 2011). Although a wide range of treatments have been developed and evaluated for children with ADHD and their parents, only a few such studies have been conducted with adolescents with ADHD (Smith, Waschbusch, Willoughby, & Evans, 2000). In fact, a review of the literature determined that more review papers than empirical papers have been published on the topic of treatments for adolescents with ADHD (Smith et al., 2000). The scarcity of research may be due to the lack of engagement and adherence in these youths, as well as a belief of stigma associated with ADHD and it’s treatment (Gulliver, Griffiths, & Christensen, 2010). For example, in a mixed method study assessing perceptions of ADHD interventions, Bussing et al. (2012) found that adolescents were significantly less willing than adult participants to consider either medication or psychosocial treatments
for their ADHD and related challenges.

Unfortunately, the few studies that have investigated treatment programs for adolescents with ADHD and their parents have not demonstrated substantial effects across all areas of concern. For example, Barkley et al. (1992) compared three family therapy programs for their effectiveness in resolving conflict among families with ADHD adolescents. The first program was Problem-Solving and Communication Training (PS/CT), a cognitive-behavioural based multi-step problem-solving and communication building approach. The second was Family Structural Therapy (FST), which involves helping families to identify and alter maladaptive family systems or interaction processes. The third program comprised parent training in behavioural techniques (BMT), such as the use of positive parental attention, point systems or token reinforcement, brief periods of grounding for unacceptable behaviour, and instruction to parents on how to anticipate impending problem situations. These three therapies were also compared to a wait-list control condition.

Families in the three treatment groups demonstrated reductions in communication difficulties, conflict, and internalizing/externalizing symptoms. However, despite statistically significant improvements at the group level, only 5% to 30% of these families demonstrated significant within-family change or improved on an index of clinical significance (i.e., movement to a subclinical range of impaired functioning). Barkley et al. (1992) concluded that, "Such sobering statistics indicate that most ADHD adolescents (70% to 95%) . . . show no clinically significant change in their number of family conflicts or the anger frequency/intensity of these conflicts, with 80% to 95% remaining deviant after treatment" (p. 460).
Barkley et al. (2001) conducted a follow-up study comparing the effects of parental BMT to PS/CT on families with comorbid ADHD/ODD. The authors sought to improve previous results by doubling the number of treatment sessions from 9 to 18 sessions. Findings resembled those reported in the authors’ initial study, showing statistical significance at the group level, but only minimal change at the individual level of analysis. Moreover, a greater drop-out rate was found for the PS/CT group, possibly due to the higher levels of adolescent involvement required in PS/CT.

Although many behavioural and parent training programs are effective for children with ADHD (for a review, see Zwi et al., 2011), ADHD in adolescence is associated with greater impairment across multiple domains of functioning, including parent-adolescent interactions (Wolraich et al., 2005). Based on the aforementioned studies and a lack of evidence-based treatments for families of adolescents with ADHD, there appear to be significant limitations to current treatment approaches for these adolescents and their parents; alternative intervention components or treatment approaches are required.

1.5 Parenting Stress

In addition to parenting styles/practices, parenting stress is also a contributor and byproduct of parent-adolescent conflicts (Theule et al., 2013). Parenting stress is the result of parents perceiving their children’s problem behaviour as exceeding the resources they have available to manage it (McCleary, 2002). Consequently, if parents judge their child’s ADHD-related difficulties as beyond their control, they will likely respond with frustration and distress (Bromley Little, 1998).

Parenting stress is significantly higher in parents of children (Reader, Stewart, &
Johnson, 2009), and adolescents with ADHD (Biondic, 2011) and stress ratings are related to higher levels of conflict in the home (Theule et al., 2013). A high degree of child inattention, hyperactivity and impulsivity places numerous demands on parents, and increases the probability that they will manage their child’s behaviours inconsistently, with over-reactive discipline, or avoidance of interactions with their child. The combined effects of the child’s ADHD and such parenting practices produce the essential conditions for the development of child oppositional behaviour problems and a difficult family environment (Johnston & Mash, 2001; Seipp & Johnston, 2005).

Harrison and Sofronoff (2002) investigated the effect of child behaviours on parental levels of stress by interviewing a sample of 105 mothers of children with ADHD. They found that the strongest individual predictors of psychological distress were child behavioural disturbance and lack of perceived parental control over child behaviours. Parents of children with externalizing disorders, such as ADHD, view themselves as having less parenting knowledge, less parental competence, and less social support (Morgan, Robinson and Aldridge, 2002). ADHD is further associated with an environment of parental discord, perceived parenting incompetence, and negative parent-child relationships and childrearing beliefs (Johnston & Mash, 2001).

Johnston and Jassey (2007) provide a review of multiple longitudinal studies that support a transactional model of parent-child interactions, whereby children’s ADHD symptoms present parents with numerous challenges to parenting, which in turn contribute to the development of child oppositional behaviour problems and parenting stress. This reciprocal pattern between parenting stress, parenting practices and the behaviour problems of ADHD children is prevalent across cultures. For instance, Anjum
and Malik (2010) asked 60 Pakistani mothers of children with ADHD to complete questionnaires regarding their own and their child’s current functioning. Results indicated a strong significant positive correlation between child disruptive behaviours, maternal stress and parent disciplinary practices. Maternal stress and child behavioural difficulties emerged as strong predictors of the use of harsh and more physical discipline. Likewise, a stepwise regression analysis showed that mother's stress, harsh parenting and over-involvement/over-protection were strong predictors of child behaviour problems. Such research highlights the role parenting plays in the development and maintenance of child disruptive behaviours and the impact child behaviour problems have on parents’ stress levels and disciplinary practices.

Although an abundance of research suggests that parenting stress in parents of children with ADHD stems primarily from the child’s ADHD-related behaviour problems, parental factors also play a significant role. In a study of 150 mothers of children with ADHD, McLaughlin and Harrison (2006) found that a lower sense of parental competence was directly associated with less effective parenting practices and high stress, beyond the effects of child age, having an only child, number or severity of ADHD behaviours in their child, and parental social isolation. Theule, Wiener, Rogers, and Marton (2011) investigated the specific parent and contextual factors underlying parenting stress among parents of children with ADHD, after controlling for the effects of child factors (e.g., ADHD, gender, age). Findings revealed that parent ADHD symptomatology was the strongest predictor of parental stress, and social support was inversely related. Biondic (2011) is the only study to date that has examined parenting stress among parents of adolescents with ADHD. Results suggest that in addition to the
adolescents’ externalizing behaviour, maternal inattention difficulties mediated the relationship between adolescent ADHD and parenting stress. These results are not surprising considering the extensive evidence of elevated rates of ADHD in parents of children with ADHD (Chronis et al., 2003).

1.6 Treatments for Parenting Stress

Although a range of psychosocial, psychoeducational and behaviour management programs are considered evidence-based treatments for ADHD due to their effects on ADHD symptoms and problem behaviour, few studies have focused on the impact of these parent training approaches on parent outcomes (Fabiano et al., 2009; Hoza, Kaiser, & Hurt, 2008; Pelham & Fabiano, 2008). Pisterman et al. (1992) investigated a program adapted from a parent-training behavioural intervention with 91 parents of preschoolers with ADHD. The 12-week parent program predominantly focused on providing parents with psychoeducation on ADHD and behavioural strategies (e.g., reinforcement, time-out, shaping) to improve child compliance and on-task behaviour. Compared to a waitlist control group, parents who participated in the program reported improvements in the Parent Domain and Sense of Competence subscale of the Parenting Stress Index (PSI) following treatment and three months later. However, no significant reductions were found in the Child Domain of the PSI. These results suggest that the parent training helped parents feel more competent and become more effective with managing the stress associated with being a parent, but not with the stress resulting from problems with their child. Anastopoulos, Shelton, Du Paul, and Guevremont (1993)’s research extended Pisterman et al.’s study to parents of school-age children with ADHD. Using Barkley’s
(1990) parent training model, they found significant improvements in parenting stress, self-esteem and parental perceptions of their children’s ADHD symptoms compared to wait-list controls.

More recently, Gerdes, Haack, and Schneider (2012) evaluated a parent-training program with 20 parents of children with ADHD. The researchers found significant reductions of parenting stress for mothers across most domains (dysfunctional parent–child interactions, difficult child, and total parenting stress); however, no significant results emerged when investigating paternal parenting stress. Similarly, a nine-week parent stress management program with 63 mothers and fathers of children with ADHD found significant improvements in parent-domain parenting stress and parenting style for mothers, but not for fathers (Treacy, Tripp, & Baird, 2005). Furthermore, the perceived locus of control, child-domain parenting stress, parent-child relationship quality, mood, and perception of child externalizing behaviour of parents did not improve from pre- to post-treatment.

Results from past research provide mixed results for the efficacy of parent-training programs for treating the high stress levels of parents of children with ADHD. Moreover, the effects of parent-training on parenting stress in parents of adolescents with ADHD have not yet been examined. Given the added stressors of parenting an adolescent, especially with ADHD, treatments targeting stress in this population are required.

1.7 Mindfulness

1.7.1. Acceptance-based approaches. Given the apparent limitations of PSM programs, PS/CT and BMT, Greco and Eifert (2004) recommended using acceptance
strategies in the context of family therapy. As an alternative to the change- and control-oriented strategies promoted in BMT and PS/CT, acceptance-based approaches emphasize an empathic understanding of the experiences of others and a nonjudgmental acceptance when addressing these experiences. Hayes (1994) states that acceptance entails “experiencing events fully and without defense, as they are” (p. 30), and indicates that scientist-practitioners may have overstressed the significance of changing unpleasant symptoms, without recognizing the value of acceptance. In acceptance-based methods there is little focus on controlling or altering the content of thoughts, but instead on shifting how people relate to their thoughts (Segal, Teasdale, & Williams, 2004). While decreasing the use of strategies aimed at avoiding negative thoughts, emotions, and body sensations, clients are encouraged to be “experientially open” to whatever is happening in the present moment (Hayes, Strosahl, & Wilson, 1999). Acceptance-based approaches include many interventions rooted in the practice of mindfulness, such as Mindfulness-Based Cognitive Therapy (MBCT), Mindfulness-Based Stress Reduction (MBSR) and Acceptance and Commitment Therapy (ACT).

1.7.2 Mindfulness and mindfulness-based interventions. Mindfulness is the non-evaluative, present-centered awareness that results from the deliberate focusing and refocusing of attention on sensations, thoughts and feelings as they arise moment-by-moment (Williams, Teasdale, Segal, & Kabat-Zinn, 2007). Mindfulness stems from Eastern Buddhist traditions and philosophy, and, as part of this tradition, is practiced to alleviate suffering and to gain insight into the nature of reality (Silananda, 1990). The Buddhist practice of mindfulness is rooted in compassion, detachment and understanding (Hanh, 1975). Buddhists have practiced mindfulness for over 2,500 years to free
themselves from attachments and cognitions and lead them to enlightenment and personal awakening (Silananda, 1990).

Drawn from an integration of Buddhist teachings with current Western psychology and knowledge, mindfulness-based interventions are used to enhance psychological and physical well-being through the processes of decentering, acceptance, exposure, and self-regulation (Baer, 2003; Bishop et al., 2004). Mindfulness comprises five main facets: (a) detached observation of and attention to one’s internal experiences; (b) a nonjudgmental attitude; (c) the ability to participate in activities with complete awareness; (d) recognition, description and labeling of one’s experiences; and (e) nonreactivity to internal experiences (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). Objectively attending to inner experiences allows one to monitor thoughts and feelings without judgment or self-criticism. Adopting an attitude of acceptance and openness to experience allows previously suppressed thoughts to enter the field of awareness. Greater awareness, recognition and regulation of cognitive processes reduce the tendency to react on ‘autopilot’ and fall into habitual patterns of responding to stressors (Baer, 2003).

A growing body of evidence supports the use of mindfulness as a treatment for a variety of health and mental health conditions. In a meta-analytic review by Hofmann, Sawyer, Witt, and Oh (2010), the authors reported that mindfulness-based programs are moderately effective treatments for adults with anxiety and depression. In her empirical review of mindfulness interventions, Baer (2003) noted the same moderate effect sizes for pain and stress in adults. MBCT, MBSR and other mindfulness-based interventions have been developed and/or adapted for the treatment of a variety of psychiatric disorders and medical diseases. For example, mindfulness-based interventions have been
demonstrated effective for clients with eating disorders (Baer, Fischer, & Huss, 2006), substance abuse (Bowen et al., 2006), chronic pain (Kabat Zinn, 1990), depression (Segal, Williams, & Teasdale, 2002), anxiety (Evans et al., 2008), insomnia (Ong, Shapiro, & Manber, 2008), attention-deficit hyperactivity disorder (Zylowska et al. 2008), fibromyalgia (Grossman et al., 2007), HIV (Creswell, Myers, Cole & Irwin, 2009), cancer (Witek-Janusek et al. 2008) and heart disease (Sullivan et al. 2009).

1.7.3 Mindfulness meditation. Mindfulness meditation involves the cultivation of a nonjudgmental sustained awareness to an object of attention (e.g., an emotion, the breath, a physical feeling, an image, or an external object) (Kabat-Zinn, 1990). In describing meditation with the breath, Hanh (1975) states that when the mind is overwhelmed, the breath is used as an anchor to bring the mind back to the present moment. Meditating cultivates a mindfulness that allows an individual to observe and accept the presence of every thought and feeling that is experienced (Hanh). Continuous meditation practice fosters greater awareness of internal experiences and increased self-regulation of attention, which leads to enhanced affect tolerance, emotional awareness, reduced avoidance, and additional attentional resources when extended to everyday life (Keune & Forintos, 2010). Given the value of practicing meditation, researchers have asserted meditation as necessary for the development of mindfulness skills (Kabat-Zinn, 1990) and investigated its independent contribution to the effects demonstrated by mindfulness-based interventions.

Most mindfulness-based interventions prescribe daily meditation practice at home as an essential component of treatment. For example, in MBSR programs, participants are given CDs with instructions to guide their formal meditations, and are recommended
to practice everyday for 45 min (Kabat-Zinn, 1990). Other manualized programs, including MBCT and ACT, encourage regular at-home meditation for at least 15 - 40 min each day (Hayes & Smith, 2005; Segal et al., 2002).

Although meditation home practice is strongly recommended in many mindfulness programs, only a few studies have evaluated the relationship between home practice and treatment outcomes. In a study of 90 cancer patients, Speca, Carlson, Goodey and Angen (2000) investigated how home meditation practice further contributed to the changes seen after a MBSR program. Findings showed that more home practice predicted reductions in stress levels and mood disturbance. Using a sample of adults with a diverse range of problems (e.g., illness-related stress, chronic pain, anxiety, etc.), Carmody and Baer (2008) found that time spent meditating during a MBSR course was significantly related to positive changes in mindfulness, and the reduction of many psychological and medical symptoms, including well-being and stress. Moreover, results revealed that increases in mindfulness mediated the relationship between formal meditation practice and improved psychological functioning, suggesting that meditation practice may lead to increases in mindfulness, which in turn leads to improvements in mental health outcomes and perceived stress.

Similarly, a randomized clinical trial assessing MBSR for adolescent psychiatric outpatients showed that frequency of sitting meditation practice and average duration of each session correlated with significant reductions in psychological symptoms, including depression and anxiety (Biegel, Brown, Shapiro, & Scubert, 2009). It should be noted that a few studies investigating meditation practice found no relationship between practice time and stress levels (Astin, 1997; Davidson et al, 2003). These findings may
not be as relevant to the current discussion, however, given that they were conducted with nonclinical samples and baseline stress levels were not at clinical levels.

1.7.4 Mindful parenting and mindfulness for parent-child interactions. In addition to a range of clinical disorders, the applications of mindfulness have also been explored in the context of parenting. Coined mindful parenting (Kabat-Zinn & Kabat-Zinn, 1997), this emerging field has attempted to bring a more accepting and empathic approach to raising children (Dumas, 2005). Mindful parenting involves bringing moment-to-moment awareness to the parent–child relationship (Duncan, Coatsworth, & Greenberg, 2009). Goldstein (2012) described mindful parenting as the process of recognizing how parents’ own upbringings affect how they parent their children, and being present and attuned to their children’s inner worlds. Duncan et al. (2009)’s model of mindful parenting suggests that parents who can remain aware and accepting of their child’s needs through mindfulness practices can create a family context that allows for more enduring satisfaction and enjoyment in the parent–child relationship.

Kabat-Zinn and Kabat-Zinn (1997) consider empathy, acceptance, and sovereignty to be the foundations of mindful parenting. Because responding empathically and nonjudgmentally to the behavioural and emotional needs of youth with disabilities requires increased levels of attention, cognitive flexibility, and self regulation from parents, these capacities may be important foci for intervention (Dumas, 2005). Through mindful parenting programs, parents are helped to recognize their beliefs and expectations about parenting and determine which types of parent-child interactions lead to conflict in their relationship. They become more aware of how they can change these interactions by changing their response to them, and select ways that foster and uphold a
positive connection with their children (Dumas, 2005; Goldstein, 2012).

Research suggests that nurturing mindfulness in the everyday context of parenting could greatly enhance the effectiveness of parent training interventions (Dumas, 2005). Numerous mindfulness programs for parents and families have emerged over the last two decades, and findings are promising (for a review, see Cohen & Semple, 2010). Studies indicate that mindfulness training for parents reduces parenting stress (Blackledge & Hayes, 2006), enhances parenting practices (van der Oord, Bögels, & Peijnenburg, 2012) and improves child compliance (Singh et. al., 2010).

To evaluate the added value of mindfulness training, Coatsworth, Duncan, Greenberg and Nix (2010) adapted an evidence-based parenting program by integrating it with mindfulness activities. Using a randomized trial design, three conditions were included: the original parenting intervention, the mindfulness-adapted parenting intervention and a delayed intervention control group. Compared to the original parenting intervention, the mindful parenting program showed similar increases on measures of child management practices, but greater improvements on measures of mindful parenting, positive and negative affective child behaviour and the parent-youth relationship. Mediation analyses revealed that the mindful parenting program enhanced mindful parenting, which in turn led to changes in child management practices and parent–youth relationships. These findings suggest that mindful parenting may contribute additive effects to current empirically validated parenting programs. Similarly, Duncan et al. (2009) amalgamated a seven-week adolescent drug prevention program with components of mindful parenting. Reports from a parent focus group subsequent to treatment completion suggested that mindful parenting enhanced awareness of how moods affect
their reactions towards their adolescents, and reduced reactivity in family situations.

Benn, Akiva, Arel, and Roeser (2012) conducted a randomized, wait-list controlled clinical study to investigate the effectiveness of an intensive 5-week mindfulness program for parents and educators of children with disabilities. Self-report data from parents in the treatment group revealed significant positive changes in stress, anxiety, mindfulness (e.g., greater awareness of internal and external experiences, less judgmental), self-compassion, relational concern (i.e., empathic concern and forgiveness) and personal growth at post-treatment and 2-month follow-up in comparison to the wait-list control group. Similar to earlier described studies, Benn et al. (2012) found that mindfulness-related effects at treatment completion mediated the caregivers’ changes in stress and anxiety at follow-up.

Using small samples of parents and children with developmental disabilities, Singh and colleagues (Singh et al., 2004; Singh et al. 2006; Singh et al., 2007) investigated how an 8- or 12-week mindful parenting program affected parent and child variables. Observational data in these multiple baseline across subjects design studies indicated that the mindful parent training led to reduced children’s aggression, non-compliance, self-injurious behaviour and improved positive mother-child interactions. Moreover, mothers reported increased parent satisfaction with their parenting skills and interactions with their children. The authors emphasized that reductions in child problem behaviours involved covariant change as a result of improvements in mindful parenting; these responses were not directly targeted in treatment.

In another multiple-baseline design study by Singh et al. (2010), two mothers of children with ADHD participated in a 12-week mindfulness parent training and results
showed enhanced child compliance. Moreover, subsequent mindfulness training for their children lead to even higher compliance levels and more positive interactions; these improvements were maintained during a six month follow-up.

1.7.5 Mindfulness as a treatment for ADHD symptoms. Little research has been conducted involving the specific application of mindfulness to the treatment of ADHD symptoms (Smalley et al., 2009). However, the rationale for using mindfulness practices to help manage ADHD-related problems is rooted in evidence demonstrating that through mindfulness, individuals learn to control arousal levels with breathing and meditation exercises, and inhibit automatic responses by gaining awareness of their emotional, cognitive and physiological experiences (Zylowska et al., 2008). Moreover, given that mindfulness involves development of greater self-regulation and awareness (Bishop et al., 2004), it may have potential for improvement of poor behavioural inhibition that is at the core of ADHD deficits (Barkley, 1997). That is, by learning to intentionally monitor thought processes and affect through mindfulness intervention, a person may be able to reduce problematic and habitual patterns of response (Williams et al., 2007), such as impulsive behaviours. Continued self-awareness may allow an individual to identify such automatic ADHD-related patterns before they arise, and consider alternative ways to respond. The repetitive act of directing one’s attention to a single, neutral stimulus (e.g., breath) through meditation may also help the individual to disengage from particularly heightened emotional states. Therefore, individuals practicing mindfulness may become less impulsive and emotionally reactive, and learn to exercise better self-regulation and manage their ADHD symptoms more effectively (Zylowska et al., 2008).

1.7.5.1 Nonclinical samples. Research involving nonclinical samples of adults has
demonstrated improvements in many of the symptoms with which individuals with ADHD struggle. For example, mindfulness meditation has resulted in improvements in attention-related behavioural responses (Jha et al., 2007; Semple, 2010), self-regulation (Tang et al., 2007), positive affect (Jha, Stanley, Kiyonaga, Wong, & Gelfand, 2010) and improved information-processing (Van Vugt, & Jha, 2011). In a recent study (Van den Hurk et al., 2010), the authors found that adults with years of meditation experience showed better ability to focus attention and enhanced inhibition of automatic responses compared to non-meditators.

Mindfulness studies involving nonclinical samples of children have also revealed potential benefits of mindfulness training for youth with ADHD. For example, in a randomized control study of 64 children, Flook et al. (2010) investigated the efficacy of a school-based mindfulness program using both parent and teacher reports. Results indicated that only those children who began the study with poor executive function had gains in behavioural regulation, meta-cognition, and overall global executive control. Also using a school-based mindfulness intervention, Napoli, Krech and Holley (2005) conducted a randomized controlled trial with 194 typically developing first, second and third grade students. Results from three attention tasks and teacher reports showed significant increases in attention and social skills, and decreases in test anxiety and ADHD-related classroom behaviours following intervention.

Salzman and Goldin (2010) examined the impact of a joint parent-child mindfulness program on 24 families. Compared to a waitlist control group, the families who received treatment showed significantly greater attention skills (i.e., alertness, switching, cognitive control) and reduced emotional reactivity in response to threatening
situations. Results indicated improved metacognitive functioning, specifically, self-judgment and self-compassion in both parents and children. However, only parents reported a significant decrease in anxiety and depression.

1.7.5.2 ADHD samples. In the last few years, mindfulness-based interventions have been developed and evaluated to determine their efficacy with ADHD samples. For example, Zylowska et al. (2008) conducted a pilot study of an eight-week mindfulness program for adults and adolescents with ADHD, called Mindful Awareness Practices (MAPs). Pre-post changes included significant improvements in self-reported ADHD symptoms and performance on neurocognitive tasks assessing attention and cognitive inhibition. Haydicky, Wiener, Badali, Milligan, and Ducharme (2012) evaluated a mindfulness-based martial arts intervention for learning disabled adolescents with and without ADHD. The authors found that, compared to a waitlist control group, youth with co-occurring ADHD improved on parent-rated externalizing behaviour, oppositional defiant problems, and conduct problems. Boys with elevated hyperactive/impulsive symptoms improved on parent-rated social problems and monitoring skills.

1.8 Summary

Adolescents with ADHD experience a range of difficulties due to cognitive deficits in executive functioning, including working memory, attention regulation and inhibition (Bush, Valera, & Seidman, 2005). At present, the most common treatments for ADHD include psychostimulant medication and psychosocial treatments (Abikoff et al., 2004). Although medication is significantly more effective than psychosocial treatments (MTA Group, 2004a), there is continued interest in non-pharmacological interventions due to
the negative side effects and poor long-term compliance associated with ADHD medications (Atzori et al., 2009; Wolraich et al., 2007). Moreover, the ADHD difficulties of adolescents place numerous demands on their parents, increasing parent stress levels and their use of overreactive parenting practices, that in turn lead to parent-adolescent conflict and increased adolescent behaviour problems (Seipp & Johnston, 2005).

Although current treatments do not appear to address the range of concerns experienced by families with ADHD (Barkley et al., 2001), there may be some potential for mindfulness-based interventions to fill this gap. Given that such approaches have the potential to improve both parent (e.g., stress, parenting practices) and adolescent (e.g., attention, self-regulation, oppositionality) related variables, mindfulness strategies may serve as an effective alternative treatment or component of intervention.

1.9 Background and Rationale of Present Investigation

Given the need for further examination of the effects of mindfulness on parent-adolescent conflict, parent stress, as well as ADHD symptoms, the present study is an extension and examination of a mindfulness-based program for adolescents with attention difficulties and their parents. The program is named MYmind: Mindfulness training for Youth with ADHD and their parents, and it was originally developed and tested by researchers in Amsterdam (Bogels, Hoogstad, van Dun, Schutter, & Restifo, 2008). MYmind, based on the empirically validated MBCT (Segal, Williams, & Teasdale, 2002), is an 8-week manualized program designed to reduce ADHD symptomatology. With a sample of 14 adolescents suffering from a range of externalizing disorders, and their parents, Bogels et al. found that the MYmind program improved internalizing and
externalizing complaints, attention problems, happiness, mindful awareness, self-control, and attunement to others, as indicated by self- and parent-report measures.

More recently, Bogels and her colleagues conducted two replication pilot studies with children aged 8-12 with ADHD and their parents (van der Oord et al., 2012), and adolescents aged 11-15 with ADHD and their parents (van de Weijer-Bergsma, Formsma, de Bruin, & Bogels, 2011). Van der Oord et al. demonstrated that MYmind significantly decreased ADHD symptoms in parents and their children, as well as parental stress and overreactivity (based on parent reports). However, teacher ratings showed non-significant effects. In van de Weijer-Bergsma et al. (2011), no significant changes were found across mother and tutor reports, but fathers reported reductions in their own stress and their adolescents’ inattention, internalizing and externalizing symptoms. Adolescents also reported improvements in their attention and externalizing symptoms at 8-week follow-up and demonstrated improved performance on neurocognitive computerized tasks. However, most of these changes were not maintained at four months follow-up.

Given the preliminary evidence for MYmind as a treatment for ADHD children and youth with behavioural difficulties and their parents, our goal was to adapt the intervention for further investigation in a North-American culture. Moreover, considering the mixed results when the sample comprised adolescents with ADHD, there is need for future investigation with this group.

The present study was designed to further examine the impact of MYmind on adolescents with ADHD and their parents. Rather than relying on pre-post questionnaires that provide little information on the process of change seen in mindfulness programs, time-series measurement via a daily emailed questionnaire was used to monitor the
ongoing reported levels of participant behaviours. The long-term effects of MYmind were measured through continued use of emailed questionnaire over six months of follow-up.

The current study included a Canadian sample to determine the effectiveness of the intervention in a North American culture and was designed to evaluate changes in the parent-adolescent relationship and family conflict. Additionally, we investigated changes in symptoms associated with ADHD and parenting stress, as was done in previous studies (Bogels et al., 2008; van de Weijer-Bergsma et al., 2011; van der Oord et al., 2012).

Mindfulness and acceptance-based procedures can help individuals bring automatic, mindless behaviour into awareness to decrease maladaptive interactions (Sawyer, Cohen & Miller, 2009). With the MYmind intervention, we hoped to teach families to identify and alter interactions that result in relational disconnections, such as emotional withdrawal or projected anger. We expected that through MYmind, adolescents with ADHD and their parents could learn empathic understanding and nonjudgmental acceptance, as well as perspective-taking and the ability to moderate behaviours focused on changing or controlling the other’s behaviours (Greco & Eifert, 2004), thereby rendering parent-adolescent interactions less distressing.

Through a detached, compassionate awareness of cognitions, individuals practicing mindfulness can learn to accept their internal experiences without becoming angry or upset by them. As a result of such enhanced emotion regulation and psychological flexibility, mindfulness can significantly reduce stress (Kabat-Zinn, 1990), which is heightened in parents of adolescents with ADHD (Johnston & Mash, 2001). Participants in the MYmind program were expected to experience lower stress levels as a result of
exercising more adaptive coping strategies, and avoiding the potentially detrimental influence of contextual-, and family-related stress appraisals.

Because mindfulness improves self-regulation of attention and emotion (Teasdale, Segal, & Williams, 1995), a skill often lacking in adolescents with ADHD (Barkley, 1997), it may be an ideal treatment for this population. By cultivating a greater sense of self-awareness, individuals practicing mindfulness can identify their impulses, distracters and purposeless motor behaviours prior to acting on them, thereby subverting their need to engage in inattentive, hyperactive and impulsive behaviours. Since past studies investigating MYmind have found mostly positive results regarding its efficacy in reducing ADHD symptoms, we hoped to replicate these findings in the present study.

Finally, given the emphasis placed on meditation in mindfulness treatments (Kabat-Zinn, 1990), we investigated the change in meditation practice of participants throughout the course of treatment and follow-up. Given the daily home practice prescribed each week in treatment, and the guided meditation CD provided to each family to support their home practice, we expected that the duration of meditation practice would increase. Considering past research suggesting a relationship between meditation and stress reduction (e.g., Carmody & Baer, 2008), we also hypothesized that an analysis of participants’ reports would reveal that meditation practice predicted stress levels.

1.10 Objectives

The present empirical investigation examined the following research objectives:

1) To evaluate the efficacy of the MYmind program with a Canadian sample of adolescents with ADHD and their parents by investigating the process of change in their
daily responses to an emailed questionnaire from baseline to treatment.

2) To examine the efficacy of the MYmind program in improving parent-adolescent relationship quality. Changes and trends in the participants’ daily reports of their distress associated with parent-adolescent conflict will be visually analyzed in time series graphs of data over baseline, treatment and follow-up.

3) To examine the efficacy of the MYmind program in improving adolescent ADHD symptomatology. Changes and trends in the parent and adolescent daily reports of adolescent inattentive, hyperactive and impulsive symptoms will be visually analyzed in time series graphs of data over baseline, treatment and follow-up.

4) To examine the efficacy of the MYmind program in improving parent and adolescent stress levels. The change and trend in parent and adolescent daily reports about their level of stress will be visually analyzed in time series graphs of data over baseline, treatment and follow-up.

5) To examine the efficacy of the MYmind program in improving duration of parent and adolescent mindfulness practice. The change and trend in parent and adolescent daily reports of the length of time they spent meditating will be visually analyzed in time series graphs of data over baseline, treatment and follow-up.

6) To examine whether the duration of home-based meditation was associated with parent
and adolescent stress levels. Parametric statistics will be used to analyze the correlation between meditation practice and stress ratings.

Chapter 2: Method

2.1 Participants

2.1.1 Recruitment. Participants were recruited from a database of youth who were previously involved in research through the ADHD lab at the Ontario Institute of Studies in Education. All participants who agreed to involvement in future research were contacted by undergraduate volunteers and asked if they would be interested in receiving information about the present study. Additionally, participants were recruited via flyers posted in nearby community centers and schools, and online sites related to ADHD.

2.1.2 Inclusion/exclusion criteria. To be included in the treatment program, adolescents were required to be between the ages of 13 – 18 years of age, to have a previous diagnosis of ADHD from a physician or mental health practitioner, and to have at least one parent willing to participate. Given that ADHD symptoms often change with maturation (Gustafsson, Holmström, Besjakov, & Karlsson, 2010), and many of the potential participants may have been diagnosed at a young age, a confirmation of ADHD symptomatology was required. Therefore, the Conners 3 - Parent version was used as a screening tool to assess current ADHD symptomatology, as indicated by at least one clinically significant score (T ≥ 70) on the DSM-IV Inattentive or DSM-IV Hyperactive/Impulsive scales (Conners, 2008). Undergraduate student volunteers administered this questionnaire and a demographic questionnaire to the parents of the adolescents over the phone prior to enrollment in the treatment program. This diagnostic
screening and intake was used to determine eligibility for the program.

Adolescents with severe mental health problems (i.e., Pervasive Developmental Disorders, Psychotic Disorders) and those with an IQ score of 80 or less were excluded from treatment due to the possibility that these deficits could affect their ability to fully participate in the MYmind program. The Vocabulary and Matrix Reasoning subtests of the Wechsler Abbreviated Scale of Intelligence (WASI) were administered to obtain an estimate of adolescents’ cognitive abilities.

Additional criteria were devised according to a secondary analysis of participation throughout intervention. Participants were excluded if (a) they attended less than 6 sessions and did not make-up the missed sessions (b) did not respond to the daily emailed questionnaires for more than 10 days consecutively throughout treatment, and (c) did not participate in home meditation practice for at least 5-10 min per day for at least 1-2 days per week, as indicated by the meditation practice item on the daily emailed questionnaires.

Insufficient meditation practice was included as an exclusion criteria because of the strong positive relationship between frequency of meditation practice and specific health outcomes (e.g., emotional well-being, mood, stress) (Biegel et al., 2009; Carmody & Baer, 2008; Keune, & Forintos, 2010; Speca et al., 2000). Best practices of MBCT suggest daily meditation of at least 30-45 min (Segal et al., 2002). However, mindfulness research involving youth with ADHD is still emerging and many current studies do not report a required length or duration of home practice (e.g., Singh et al., 2010). Given that some studies suggest that short meditations practiced once or twice a week result in positive changes in youth with mental health difficulties (Britton et al., 2010), we included participants who meditated for at least 5-10 min per day for at least 1-2 days per
Based on the above criteria, 11 (32%) of 34 participants enrolled (19 parents, 15 adolescents), were excluded from the study and considered treatment non-completers. Of the 11 non-completers, three (2 adolescents, 1 parent) did not attend at least six sessions (27%), five (3 adolescents, 2 parents) did not respond to the daily emailed questionnaire for more than 10 consecutive days (46%), resulting in insufficient data, and three (1 adolescent, 2 parents) did not participate in home meditation practice for at least 5-10 min per day for at least 1-2 days per week (27%). Completers and non-completers did not differ with respect to any of the measured demographic variables (see Table 1).

2.1.3 Demographic and diagnostic information. Twenty-two participants were included in the study, including nine adolescents (4 girls, 5 boys) and 13 parents (10 mothers, 3 fathers). As shown in Table 1, eight of the nine adolescents had a history of at least one comorbid condition, according to parent report before intervention. Although parent ADHD was not assessed, and no other data related to a history of mental health was collected for parents, four of the parents reported having a previous diagnosis of ADHD. Six of the families previously participated in family therapy and five of the families previously participated in behavioural treatment for the behaviour of the adolescent. Seven of the adolescents were taking psychostimulant medication for ADHD symptoms and three were taking other medications at the onset of treatment. Participants were asked to continue treatment as usual throughout their participation in MYmind.
Table 1

*Demographic and Diagnostic Characteristics of Participants and Noncompleters*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Participants</th>
<th></th>
<th>Noncompleters</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adolescent (n = 9)</td>
<td>Parent (n = 13)</td>
<td>Adolescent (n = 6)</td>
<td>Parent (n = 5)</td>
</tr>
<tr>
<td>Male</td>
<td>5 (56%)</td>
<td>3 (23%)</td>
<td>5 (83%)</td>
<td>1 (20%)</td>
</tr>
<tr>
<td>Female</td>
<td>4 (44%)</td>
<td>10 (77%)</td>
<td>1 (17%)</td>
<td>4 (80%)</td>
</tr>
<tr>
<td>ADHD Diagnosis</td>
<td>9 (100%)</td>
<td>4 (31%)</td>
<td>6 (100%)</td>
<td>1 (20%)</td>
</tr>
<tr>
<td>Comorbid Diagnosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning Disability</td>
<td>5 (56%)</td>
<td></td>
<td>5 (83%)</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>2 (22%)</td>
<td></td>
<td>1 (17%)</td>
<td></td>
</tr>
<tr>
<td>Anxiety Disorder</td>
<td>2 (22%)</td>
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</tr>
<tr>
<td>Tic Disorder</td>
<td>1 (11%)</td>
<td></td>
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<tr>
<td>Use of psychostimulant medication</td>
<td>7 (78%)</td>
<td></td>
<td>4 (67%)</td>
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</tr>
<tr>
<td>Use of other medication</td>
<td>3 (33%)</td>
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<td>1 (17%)</td>
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<tr>
<td>Past participation in therapy</td>
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<td>Family therapy</td>
<td>6 (67%)</td>
<td>6 (46%)</td>
<td>5 (83%)</td>
<td>4 (80%)</td>
</tr>
<tr>
<td>Behavioural</td>
<td>5 (56%)</td>
<td>5 (38%)</td>
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<td>3 (60%)</td>
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therapy

Marital Status

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<th>SD</th>
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<th>M</th>
<th>SD</th>
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Education level

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<tr>
<td>College diploma</td>
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<tr>
<td>Postgraduate degree</td>
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English spoken at home

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<th>M</th>
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<td>7</td>
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<td>11</td>
<td>85</td>
<td>5</td>
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<th>Age (years)</th>
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<th>Age (years)</th>
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<th>SD</th>
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<td>3.82</td>
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<tr>
<td></td>
<td>14.5</td>
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<td>50.2</td>
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2.2 MYmind Program Description

2.2.1 MYmind: Mindfulness training for Youth with ADHD and their parents. MYmind, based on the empirically validated MBCT program developed by Segal et al. (2002), is an eight 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 of coping 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. The Canadian version of the manual was modified to reflect the current cultural and linguistic trends of a major North American urban centre. For example, videos of European celebrities were replaced with videos featuring North American celebrities. Content was also added to ensure that the manual remained consistent with the goals of the current study and appropriate for 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. Reflection sheets, which asked participants to think about their experiences in MYmind, were incorporated into the 4th and 8th sessions to gauge treatment impact, enhance motivation for change, increase adherence, and maintain therapeutic rapport.

2.2.2 General overview of program. Families were invited to attend an intake interview with a facilitator to discuss motivation, commitment, and individualized goals for the program. Families were also asked to identify barriers that could interfere with their participation in the program (e.g., transportation). The purpose of the interview was to assess readiness and suitability for the program, establish therapeutic rapport, and enhance engagement in the therapeutic process. Families who were deemed to be a good fit for the intervention were enrolled in the next available group.

Parents and adolescents attended parallel groups. For both groups, each 1.5 hour session consisted of activities and discussions related to major themes, and included elements of mindfulness/yoga, 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 to ensure compatibility with 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 in which 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.

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 received workbooks containing summaries of key concepts, assignments, and space to record their experiences during the week. Participants received daily text messages reminding them to practice mindfulness at home. 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 six weeks after the completion of MYmind. 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 four parent groups and the other facilitator ran all four adolescent groups to ensure treatment consistency and to control for therapist effects. Facilitators followed the manual closely to ensure treatment fidelity.

2.2.3 Adolescent sessions. Adolescent groups consisted of 3-5 participants and 1-2 facilitators. Adolescent sessions were conducted in a quiet, low-stimulus room furnished with chairs, yoga mats, cushions, an easel with chart paper, and a projector. In order to provide consistency and predictability, sessions followed a standard format and activities were outlined on an agenda. The agenda was displayed in a prominent place and reviewed at the beginning of each session. The agenda delineated the theme of the session, the main activities, and the points associated with participation in the activities.

Each session began with a guided sitting meditation. Adolescents were encouraged to use chairs for meditation because chairs support correct posture (i.e. prevent slouching) and promote generalization to other settings (e.g., similar to sitting in
a desk chair, at the kitchen table, or on the bus). In the final few sessions, adolescents were introduced to zafu cushions as an alternative option. Sessions began with short (5 min), highly structured meditations in which the facilitator provided frequent guidance and reminders to return their attention to their breath. The length of the meditation gradually increased and the level of scaffolding gradually decreased each week. By the final session, adolescents were expected to meditate for 15 min with only minimal guidance from the facilitator. Sitting meditations were followed by group discussion about thoughts, feelings, and sensations that arose during the exercise. These discussions were included to foster curiosity, openness, and nonjudgmental acceptance of moment-to-moment experiences. Following a brief review of the concepts covered the previous week, the facilitator introduced the main theme of the session.

Content was delivered via teaching, group discussions, videos, images, poetry, mindful activities, games, and role-play. The content of the first four sessions focused on awareness and acceptance of self in relation to ADHD. Major topics of discussion included the symptoms of ADHD, positive attributes associated with ADHD, challenges faced by teens with ADHD (e.g., anxiety, depression, peer relations, learning problems), the impact of ADHD on daily functioning, and the applications of mindfulness for ADHD (e.g., improving focus, reducing impulsivity). The aim of the latter four sessions was to cultivate mindful relationships. Adolescents learned to identify their automatic reactions and make mindful choices, use mindfulness techniques to regulate their emotions during conflicts, listen with full attention, respond to others with empathy, and refrain from judging themselves or others. For an overview of major themes and activities, see Table 2.
Adolescents also participated in 10 min of mindful yoga each week. They were
guided to focus attention on their breath and the sensation of their muscles stretching and
contracting with each pose. Yoga was done near the end of each session to help the
adolescents calm their breath, bodies and minds and ease the transition from the
therapeutic space to the outside world. Each session ended with a discussion about home
practice assignments and points.

2.2.4 Parent sessions. Parent groups included 3-7 participants and 1 facilitator.
Parent sessions were held in a quiet room with a large table and chairs in the center, zafu
cushions placed in a circle towards the back, an easel with chart paper towards the side,
and a projector screen at the front. Posters stating relevant quotes were posted on the
walls at the start of almost every session to reflect that session’s theme. Each session
began with parents seated on zafu cushions for a meditation that gradually increased in
duration each week. In the first session, the facilitator guided parents through a 5-min
structured sitting meditation. Facilitator supervision was gradually faded over the course
of the program. By the final session, parents were meditating independently with no
guidance for 30 – 40 min.

All sessions ended with a shorter (e.g., 5 -10 min) meditation, which differed
from the sitting meditation. These different meditation practices (e.g., a body scan,
breathing space, metta meditation or a mountain meditation), were introduced, discussed
and then practiced. The range of exercises provided the parents with a variety of options
to practice their breathing and awareness at home. Parents were encouraged to practice
the exercises that were most applicable to their lifestyle, level of experience, and practical
constraints (e.g., physical limitations). All meditations were followed by a group
discussion in which parents were given the opportunity to explore their experiences with curiosity and acceptance. The facilitator encouraged the parents to discuss any obstacles they may have experienced (e.g., recurring distractions), or thoughts, emotions and sensations that surfaced during the meditation.

The content of the sessions focused on the participants’ role as parents and the specific challenges they face in raising an adolescent with ADHD. Therefore, in addition to formal meditations and mindfulness exercises, activities and discussions addressed the application of mindfulness to their relationship with their adolescent. For example, parents were taught to observe themselves and their adolescent with acceptance and compassion. They learned to attend to the attributions and expectations they make about themselves and their adolescent that allowed them to bring an open, nonjudgmental stance to their parenting interactions. They were encouraged to become more aware of their stressful triggers and to preemptively make conscious choices about how to respond, rather than reacting automatically. Many activities focused on specific skills, including communication, problem-solving, empathic understanding and self-compassion. For a summary of the main themes and exercises, see Table 2.

In session, each topic was typically first discussed by the facilitator through didactic teaching, videos, or powerpoint presentations. Parents were then asked to engage in a group discussion, role-play, or reflection on a poem or quote. This structure was used to facilitate both didactic and experiential learning, in addition to providing parents with a forum to share personal experiences and ask questions. All sessions concluded with a discussion of that week’s home practice assignments and handouts.
Table 2

*Brief Overview of the Content of Adolescent and Parent Sessions*

<table>
<thead>
<tr>
<th>Theme</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Attention</strong></td>
<td>Welcome, sitting meditation, psychoeducation about ADHD, group contract, review points system, mindful eating activity</td>
</tr>
<tr>
<td><strong>2. At Home in Your Body</strong></td>
<td>Sitting meditation, psychoeducation about mindfulness, body scan, yoga with emphasis on body</td>
</tr>
<tr>
<td><strong>3. Breath</strong></td>
<td>Sitting meditation, breath for daily activities, 3-minute breathing space, yoga with emphasis on breath</td>
</tr>
<tr>
<td><strong>4. Distraction and The Wandering Mind</strong></td>
<td>Bubble meditation, fixation exercise (stationary point vs. moving object), attention to detail game, meditation with sounds, yoga, half-way reflection</td>
</tr>
<tr>
<td><strong>5. Thoughts are Not Facts/ Doing Homework</strong></td>
<td>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</td>
</tr>
<tr>
<td><strong>6. Automatic Reactions</strong></td>
<td>Sitting meditation, automatic pilot (expressway vs. pathway), role-play, yoga, breathing space with coping and choices</td>
</tr>
<tr>
<td><strong>7. Mindful Communication</strong></td>
<td>Sitting meditation with stressful event and empathy; thoughts, feelings and sensations related to automatic pilot; being present in communication; mindful listening role play; yoga</td>
</tr>
<tr>
<td><strong>8. On Your Own</strong></td>
<td>Sitting meditation, adolescent-led mindfulness exercises,</td>
</tr>
</tbody>
</table>
reflection activity, action plan for continuing mindful practice,

Metta meditation

Parent Sessions

<table>
<thead>
<tr>
<th>Theme</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Awareness</td>
<td>Welcome and introductions, sitting meditation, rationale of training, raisin exercise, introduction to mindfulness, explanation of homework assignments and adolescents’ reward system</td>
</tr>
<tr>
<td>2. At Home in Your Body</td>
<td>Sitting meditation with emphasis on body, discussion of obstacles to home practice, psychoeducation about ADHD, psychoeducation about mindfulness and its connection to parenting, body scan</td>
</tr>
<tr>
<td>3. Breath</td>
<td>Sitting meditation with emphasis on the breath, pleasant events calendar and triangle of awareness, poem and awareness activity, introduction to 3-minute breathing space</td>
</tr>
<tr>
<td>4. Responding with Awareness</td>
<td>Sitting meditation, unpleasant events calendar, psychoeducation about stress and automatic responding, responding with awareness activity, 3-minute breathing space, half-way reflection</td>
</tr>
<tr>
<td>5. Automatic Reactions and Patterns</td>
<td>Sitting meditation, psychoeducation and discussion about automatic behaviour patterns/parenting practices, sitting meditation with stressful event and empathy</td>
</tr>
<tr>
<td>6. Communication and</td>
<td>Sitting meditation, role-play on communication with child,</td>
</tr>
</tbody>
</table>
**Empathy**

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 vs. 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

---

**2.3 Procedure**

The intervention was delivered to 16 families across four groups of 3-5 families.

The groups were capped at five families to ensure that all participants were able to participate fully in the exercises and discussions. The treatment was carried out in two waves over a period of seven months, with the first two groups running from April to June 2011 and the second two groups from June to August 2011.

Prior to enrollment in MYmind, adolescents and their parents attended individual interviews lead by the group facilitators. The goals, expectations and potential risks and benefits of the MYmind program were explained in detail. The individual interviews with families and group facilitators were also used to ensure that MYmind was a good fit for each families’ needs, and to enhance participants’ motivation by setting personal goals. Following these meetings, participants were given a package containing an information
letter (see Appendix A), consent form (see Appendix B), and standardized questionnaires that were included for a separate study. Youth who did not have a previous cognitive assessment confirming an IQ above 80 were administered the WASI in a separate room by one of the group facilitators. Approximately one month after these initial meetings, participants started the MYmind program, which ran for eight consecutive weeks. Six weeks following the last session of MYmind, participants were offered an additional booster session.

All participants were required to complete the DSQ individually, which was emailed to them each day at a specified time. A few adolescents did not have an email account that they checked regularly and thus, either had the questionnaires sent to their parents’ email address for them to complete, or were given paper questionnaires that they submitted each week. In addition to the emails, participants received a daily text-message reminding them to meditate and to check their email for the purpose of questionnaire completion. The participants were asked to complete the questionnaires every evening during baseline and treatment phases and then for one week every month for six months following the completion of treatment (Follow-up). On the final day of treatment, the participants were asked to complete a Consumer’s Satisfaction Questionnaire to evaluate the acceptability of the MYmind program.

2.4 Measures Used to Describe and Define the Sample

2.4.1 Demographics Questionnaire. Undergraduate volunteers administered the demographic questionnaire to parents over the phone prior to their enrollment in the treatment program (see Appendix C). The demographics questionnaire contained
questions concerning the adolescent’s health history, adolescent use of medication, past participation in psychotherapy, parental education and employment status, and family composition.

2.4.2 Conners’ Parent Rating Scale—Third Edition. The Conners’ Parent Rating Scale -Third Edition (Conners, 2008; Conners 3-P) was administered to parents over the phone by graduate or undergraduate student volunteers to confirm continuation of ADHD symptoms in adolescents prior to enrollment in treatment. The Conners 3-P is a norm-referenced questionnaire used to evaluate inattention, hyperactivity and impulsivity, as well as executive functioning, learning problems, aggression, peer relations, and family relations. Parents were asked to rate their adolescent on a 4-point scale from 0 (Not at all/Seldom, Never) to 3 (Very Much True/Very Often, Very Frequent). The two DSM-IV ADHD subscales on the Conners 3-P (DSM-IV Inattention, DSM-IV Hyperactivity/Impulsivity) demonstrate high internal consistency (.93, .92) and adequate to high test-retest reliability (.84, .89).

2.4.3 Wechsler Abbreviated Scale of Intelligence (WASI). The WASI (Wechsler, 1999) is a standardized abbreviated intelligence test, which provides an estimate of general cognitive ability. For those adolescents who did not have a recent assessment of their cognitive abilities, the WASI was administered to them to confirm an IQ of at least 80. The Vocabulary and Matrix Reasoning subtests were administered by one of the facilitators prior to enrollment in treatment. The WASI has high internal consistency (.93) and test-retest reliability (ranging from .88 to .93) across the two IQ scales.
2.5 Outcome Measures

2.5.1 Daily Symptoms Questionnaire (DSQ). The Daily Symptom Questionnaire (DSQ) was developed by the primary investigator and her supervisor (see Appendix D). In designing the DSQ, we had two main objectives: (1) to develop an objective measure of a wide range of mental health issues relevant to families with ADHD, (2) to make sure the questionnaire was short and straightforward, so that respondents could complete the measure everyday via email. The parent and adolescent versions of the DSQ measured the same constructs.

Because we hypothesized that participation in the MYmind program would improve the participants’ stress levels and family conflict, two major concerns in families with ADHD, we included one item evaluating participants’ stress levels and one evaluating parent-adolescent conflict. We also hypothesized that participation in the MYmind program would reduce adolescents’ ADHD symptomatology. Therefore, we included three ADHD symptom items, one to assess inattention, one for hyperactivity and one for impulsivity. Both parents and adolescents were asked to evaluate the adolescents’ ADHD symptomatology since research indicates that adolescents’ reports of their own symptoms markedly differ from parent reports about their adolescents (Rasmussen et al., 2002).

Another item asked how much time participants spent with their parent/adolescent, providing a potential means of determining whether lack of stress or conflict was due to a lack of interaction. Lastly, one item queried the duration of home-based meditation practice to investigate whether more meditation leads to greater treatment effects. Overall, this 7-item questionnaire was developed to investigate whether participation in
the MYmind program would result in less stress, less parent-adolescent conflict, reduced levels of ADHD symptomatology and greater meditation practice.

The 7-item DSQ incorporated a 5-point likert scale format that was easy for participants to complete in a short period of time. Participants were asked to respond to each item by typing an X beside the rating that best describes their feelings and behaviours that day. The 5-point scale ranged from 1 (Not at all, Not very, Almost none) to 5 (A lot, Very well, More than __ time). Participants were also sent an instruction sheet that provided an operational definition of each level of each construct (see Appendix E), to help participants assess their behaviours/emotions and differentiate between different levels of a construct. For example, “a little” stress was defined as feeling fairly calm, and only mildly bothered by events that day.

2.5.2 Consumer-Satisfaction Questionnaire (CSQ). The Consumer-Satisfaction Questionnaire (CSQ) assessed parent and adolescent satisfaction with intervention efforts as a measure of social validation of study results (Wolf, 1978). The CSQ was developed by the primary investigator and modeled after a similar measure used for other treatments in previous studies (Ducharme & Drain, 2004; Ducharme, Atkinson, & Poulton, 2001) (See appendix F). The CSQ includes 15 items divided into three sections. The first section consists of nine 5-point likert scale items and two open-ended questions asking participants about their experience in the MYmind program. The second section includes three items for rating group facilitators on a 5-point likert scale. The third section comprised one open-ended question asking participants to share any general comments about the MYmind experience. Both adolescent and parent participants were asked to complete the CSQ on the final day of treatment.
2.6 Research Design

The multiple Daily Symptom Questionnaire (DSQ) responses from each participant throughout the course of baseline, treatment and follow-up provided a source of time-series measurement that could be used as part of a multiple baseline design. Baseline DSQ measurement began simultaneously for the first two groups; at a later time, baseline DSQ measurement for the second two groups was also initiated simultaneously. For multiple baseline purposes, intervention was introduced in a time-lagged fashion. Group A had two weeks of baseline, Group B had three weeks of baseline, Group C had four weeks of baseline, and Group D had five weeks of baseline (See Figure 1). Thus, Group B served as a form of waitlist control for Group A, and Group D provided a form of waitlist control for Group C. Moreover, the longer time lags for Groups C and D contributed an additional component to the research design, providing a more rigorous control for length of time engaged in pre-treatment measurement.

With this multiple baseline format, experimental control is demonstrated if levels of responding remain unchanged until the independent variable is introduced, regardless of the varied lengths of baseline phases (Hartman & Hall, 1976). In the present study, DSQ measurement of the first group was expected to change with the introduction of the MYmind program, while the behaviour of untreated groups was expected to remain stable until the subsequent introduction of the intervention.

In this design, baseline measures of specific behaviours of individual participants, such as the duration of parents’ and adolescents’ meditation practice, or their overall stress levels, were compared to the same measures following introduction of the intervention, and during post-intervention follow-up, to determine the extent of treatment
effects. One of the advantages of multiple baseline time-series measurement is that it enables the researchers to observe the process of change in the pattern of treatment results over a period of time, while ruling out the confounding influence of chance fluctuations in behaviour, historical events, and maturation effects (Myers & Hansen, 2006).
2.7 Data Analysis

2.7.1. Time-series analysis. Based on the daily-submitted DSQ, the number response to each item was entered into a database to measure the related construct (e.g., general stress) over baseline, treatment and follow-up for each participant. Response means for each participant were calculated across baseline, the first four weeks of treatment, the last four weeks of treatment and follow-up to compare the mean difference of each construct from baseline to follow-up. As is appropriate for time-series designs, data points and mean lines were analyzed through visual analysis of graphic displays of the daily response data (Hersen & Barlow, 1976). The graphs were examined to evaluate the magnitude of change, rate of change, and diversity of responses from baseline to follow-up. To assess the magnitude of change, the changes in level (i.e., shift or discontinuity in practices) across phases were examined. The rate of change was evaluated through inspection of changes in trend (i.e., systematic increase or decrease) and latency of the change (i.e., the temporal proximity of the change to the introduction of treatment) (Kazdin, 2001). The variability of data was investigated by examining the degree to which behaviour fluctuated across and within phases (Horner et al., 2005). In keeping with the multiple-baseline across groups design, visual analysis also entailed comparison of baseline levels of one group of participants to the concurrent post-treatment levels of participants for whom treatment had already occurred, as a form of time-series wait-list control group comparison (Kazdin, 2001).

2.7.2. Generalized estimating equations (GEE). Considering the relatively small sample size of the present investigation, the dependent nature of the data, and the lack of assumptions about the distribution of the behaviours of interest in the general population,
most parametric statistical analyses could not be used in the current analyses. However, generalized linear modeling supports non-normal distributions for dependent variables, and generalized estimating equations (GEE) extends general linear models further by involving dependent data for repeated measures, logistic regression and various other models for time series or correlated data (Ballinger, 2004; McCullagh & Nelder, 1989). For general linear models, data must meet the assumption of normality, independence and homogeneity of variance, but the GEE method accounts for the correlation of responses within response variables and is flexible enough for use in analyzing response variables that are not normally distributed. Therefore, these are parametric approaches, which have unique assumptions regarding the distribution of the reported data (Neal & Simons, 2007). GEEs are used to estimate the parameters of a generalized linear model with a possible unknown correlation between outcomes. When faced with longitudinal data that consists of repeated measures that may be correlated within a subject, researchers must consider the correlation within responses when estimating regression parameters. Otherwise, they can make incorrect inferences about the regression coefficients and inefficient or biased estimates of the regression coefficients (Diggle et al., 2003) that could lead to false conclusions regarding their research questions. Thus, the GEE procedure allows for a better model fit over analyses based on ordinary least squares (OLS), such as analysis of variance (ANOVA) and multiple regression (Ballinger, 2004).

To fulfill objective #6 (i.e., ‘to examine whether the meditation component of the MYmind program had an independent relationship with participants’ stress-related outcomes’), a GEE analysis was conducted. Considering past research has suggested a potential correlation between stress reductions and at-home meditation practice among
other populations (e.g., Carmody & Baer, 2008; Speca et al., 2000), the current study aimed to investigate whether meditation practice would positively impact the stress levels of parents and youth with ADHD. No past research has suggested a relationship between meditation practice and any of the other constructs being investigated in the present study, so only stress levels were further analyzed.

The GEE analysis was conducted with a gamma distribution and a log link. The construct-specific participant stress-related indicators were transformed to reflect a positively skewed gamma distribution. The gamma distribution was chosen because the aforementioned dependent variables are ordinal, positively skewed and the gamma distribution represented the best fit to the distribution of the dependent variable, stress. A log link was chosen because it applies to positive numbers and ensures a positive mean (Ruppert, Wand & Carroll, 2003). Generalized estimating equations were the selected method of analysis because participants’ responses were correlated over time. Given the time-series nature of the data, phase (baseline, treatment and follow-up) was included as a variable in the model, in addition to the parent or adolescent status of the participant, to determine whether either of these variables affected stress levels. The impact of adolescent/parent status and phase was assessed by adding the interaction terms in the analysis.

**Chapter 3: Results**

To investigate the effects of MYmind on parents and their adolescents with ADHD, we examined both trends in the time series data and mean levels for each phase of intervention: baseline, the first four weeks of treatment, the last four weeks of treatment,
and follow-up. For a data series in which there was a substantial positive change in level from baseline to treatment that continued in follow-up, the series was considered a treatment improvement with maintenance. When the data series showed substantial positive change from baseline to treatment that did not continue in follow-up, the series was deemed a treatment improvement without maintenance. For a data series that showed no substantial change in treatment, but a positive change from baseline to follow-up, the series was considered a late treatment improvement. Finally, a data series that indicated no substantial change from baseline to treatment or from baseline to follow-up was deemed as representing no improvement.

To distinguish the extent of treatment improvements, differential levels of improvement magnitude were established. If the mean demonstrated a positive change from baseline to treatment/follow-up of 0.5 to 0.9 (10 – 19%), it was classified as a small improvement. If the mean showed a positive change of 1.0 – 1.9 (20 – 39%), it was classified as a medium improvement. If the mean demonstrated a positive change of 2.0 or greater (40% or more), it was classified as a large improvement. For a series to be considered a treatment improvement, visual analysis of time-series data trends had to corroborate the changes in mean levels.

3.1 Participant Stress

3.1.1 Parent self-report of stress. Visual analysis of data trends and mean levels in Figure 2 suggests that participation in MYmind had a reductive effect on parent reported levels of stress for the majority of parents. Although data for stress ratings remained somewhat variable at the onset of treatment, 11 of 13 parents (85%) showed notable
improvements in the last half of treatment and/or across follow-up. Regarding magnitude of change, six parents reported medium treatment improvements (P1, P2, P3, P6, P12, P13), five parents reported small treatment improvements (P4, P5, P7, P9, P11) and two parents reported no improvements (P10, P13). Of the eleven parents who reported at least some positive change, seven of them reported treatment improvements that were maintained in follow-up (P1, P2, P3, P4, P7, P12, P14), three of them reported a late treatment improvement (P5, P6, P11), and one of them reported improvements that were not maintained in follow-up (P9). As a further demonstration of the stable patterns of low stress levels after intervention, no parents reported the two highest levels of stress, “A lot” or “Quite a bit”, in follow-up.
Figure 2. Parent Report of Stress Levels across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
Figure 2. Parent Report of Stress Levels across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
Figure 2. Parent Report of Stress Levels across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
3.1.2 Adolescent self-report of stress. Visual analysis of data trends and mean levels in Figure 3 reveals that participating in MYmind had a reductive effect on stress levels for adolescent participants. Eight of the nine adolescents (A1, A2, A3, A4, A5, A6, A7, A8) showed small decreases by the end of treatment and/or in follow-up, and one adolescent reported no improvement (A9). Of the eight adolescents reporting reduced stress, one of them reported treatment improvements that were maintained in follow-up (A3), four of them reported late treatment improvements (A1, A2, A4, A5), and three of them reported improvements that were no longer present in follow-up (A6, A7, A8).

As indicated by visual analysis and mean levels, most adolescents reported high and variable levels of stress throughout baseline and at the start of treatment. However, a downward trend throughout treatment can be seen in Figure 3, suggesting somewhat lower levels of stress near the completion of this phase or in follow-up. For instance, the majority of adolescents’ stress ratings decreased by one level so that those reporting “Quite a bit” of stress at the start of treatment were mainly reporting “Some” stress by the end, and those reporting “Some” stress at the onset were reporting “A little” stress or “Almost none” by the final sessions. However, stress ratings increased for A4, A5, A7 and A8 in follow-up, when school resumed in September (indicated on the graph by vertical dotted lines).
Figure 3. Adolescent Report of Stress Levels across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
Figure 3. Adolescent Report of Stress Levels across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
3.2 Participant Distress due to Family Conflict

3.2.1 Parent self-report of distress due to conflict with adolescent. Given that one parent completed two of these items each day because of her two adolescent participants, 14 rather than 13 parent reports are included in the analysis of parent distress due to family conflict. Visual analysis of data trends and mean levels in Figure 4 indicates that completion of MYmind had a positive effect on the parents’ self-reported distress from conflicts with their adolescents. For 10 of the 14 parents (71%), there was a downward trend in reports of distress from family conflict during treatment, with a much lower level of variability by the end of this phase and in follow-up. Six parents reported medium improvements (P2, P3, P4, P11, P12, P14), four parents reported small improvements (P1, P5, P6, P13) and four parents reported no improvements (P7, P8, P9, P10). All four of the parents demonstrating no treatment effects reported baseline levels predominantly in the “Almost none” or “A little” distress range with baseline means below 1.9, providing little potential for improvement. Thus, 10 of the 10 parents (100%) with real potential for change reported reduced levels of distress from conflict.

Visual analysis of Figure 4 shows that more than half of the parents (57%) reported distress ratings that were higher at the onset of treatment than in baseline. Despite these increased distress ratings, seven of the 10 parents who indicated some distress reduction reported treatment improvements that were maintained in follow-up (P2, P3, P4, P6, P11, P12, P14), and the other three parents reported late treatment improvements (P1, P5, P13). These follow-up data suggest that the further treatment progressed, the less distressing conflicts with their adolescents became. In fact, no parent reported that they were experiencing “A lot” or “Quite a bit” of distress due to family conflict throughout six
months of follow-up, and only three parents reported feeling more than “A little” distress once or twice subsequent to treatment completion.

*Figure 4. Parent Report of Distress due to Conflict with their Adolescents across Baseline, Treatment and 6-month Follow-up*
*Note.* Mean lines highlighted in blue.
Figure 4. Parent Report of Distress due to Conflict with their Adolescents across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
Figure 4. Parent Report of Distress due to Conflict with their Adolescents across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
3.2.2 Adolescent self-report of distress due to conflict with parent. Visual analysis of data trends and mean levels in Figure 5 shows that participation in MYmind had a positive impact on adolescent-reported distress due to conflict with their parents, with seven of nine adolescents (78%) showing improvements. Three adolescents reported medium improvements (A6, A8, A9), four adolescents reported small improvements (A1, A2, A3, A4) and two adolescents reported no improvements (A5, A7). Treatment data were generally characterized by a downward trend with lower, more stable levels of distress as treatment progressed and no adolescents reporting high levels of conflict-related distress (e.g., “A lot” or “Quite a bit”) during the second half of treatment or follow-up. Of the seven adolescents reporting a reduction in distress, four of them reported treatment improvements that were maintained in follow-up (A2, A4, A8, A9), and the other three adolescents reported late treatment improvements (A1, A3, A6). Similar to parent distress ratings, adolescents’ distress data in follow-up suggest that the treatment effects maintained or improved with time.
Figure 5. Adolescent Report of Distress due to Conflict with their Parents across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
Figure 5. Adolescent Report of Distress due to Conflict with their Parents across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
3.3 Adolescent Inattention

3.3.1 Parent report of inattention in adolescents. Given that one parent completed two of these items each day because of her two adolescent participants, 14 instead of 13 parent reports are included in the analysis of adolescent inattention. Visual analysis of data trends and mean levels in Figure 6 demonstrates that participating in MYmind had a reductive effect on a subsample of adolescents’ inattention levels, according to parent reports. Nine of 14 parents (64%) reported that their adolescents experienced less difficulty paying attention subsequent to completing MYmind. However, some of these downward trends were difficult to discern and characterized by a high degree of variability.

Of the nine parents who reported a notable decrease in their adolescents’ inattention, one parent indicated a large improvement (P12), two reported medium improvements (P4, P11), and six indicated small improvements (P1, P2, P3, P5, P6, P14). Five parents reported no changes across phases (P7, P8, P9, P10, P13). However, given the nearly flat baselines of P9 and P10, there was no potential for their ratings to improve. Thus, of the 12 parents whose data had the potential for improvement, nine parents (75%) reported positive changes in their adolescents’ inattention symptoms.

Analysis of trends and mean levels suggest that of the nine parents who reported a reduction in adolescent inattention, four of them reported treatment improvements that were maintained in follow-up (P4, P11, P12, P14), four of them reported a late treatment improvement (P1, P2, P3, P5), and one of them reported improvements that were not maintained in follow-up (P6). Most parents reported many more low ratings during the latter half of treatment and follow-up with less variability compared to baseline and
initial weeks of treatment. P6 showed a unique pattern of results with reports of lower levels of adolescent inattention at the end of treatment and start of follow-up compared to baseline and the start of treatment; however, these ratings increased again in the latter half of follow-up.
Figure 6. Parent Report of Adolescent’s Inattention across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
Figure 6. Parent Report of Adolescent’s Inattention across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
Figure 6. Parent Report of Adolescent’s Inattention across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
3.3.2 Adolescent self-report of inattention. Visual analysis of data trends and mean levels in Figure 7 suggests that participating in MYmind positively affected a subsample of adolescents’ self-reported inattention levels, with only four adolescents indicating reductions (44%). Similar to parent ratings, adolescent data were characterized by a high degree of variability within and between participants. In contrast to parent ratings, however, more than half of the adolescents (5) showed no downward trends in their reports of inattention symptoms from baseline to treatment (A1, A3, A5, A6, A7), as evidenced by the large number of overlapping data points across phases. Of the four adolescents who reported positive change, three adolescents reported small improvements (A2, A4, A8), and one adolescent reported a medium improvement (A9).

Two of these four adolescents reported treatment improvements that were maintained in follow-up (A2, A9), one adolescent reported a late treatment improvement (A4), and one adolescent reported an improvement in treatment that was not maintained (A8). Although data from A4 and A8 reveal reduced inattention levels after participating in MYmind, A8’s ratings increased at the start of follow-up and remained high throughout, whereas A4’s data was low at the start of follow-up, but increased in the last couple of months. These late peaks in data suggest that both adolescents struggled to maintain the effects of treatment.
Figure 7. Adolescent Report of Inattention across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
Figure 7. Adolescent Report of Inattention across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
3.4 Adolescent Hyperactivity

3.4.1 Parent report of hyperactivity in adolescents. Given that one parent completed two of these items each day because of her two adolescent participants, 14 instead of 13 parent reports are included in the analysis of adolescent hyperactivity. Visual analysis of data trends and mean levels in Figure 8 suggests that completing the MYmind treatment had a reductive effect on most of the adolescents’ hyperactivity symptoms, according to parent reports. Specifically, 10 of 14 parents (71%) reported decreased levels of their adolescents’ hyperactivity by follow-up. One parent reported a large improvement following treatment (P12), three parents indicated medium improvements (P4, P11, P14), six parents reported small improvements (P1, P2, P3, P5, P6, P8), and four parents reported that their adolescents’ hyperactivity symptoms did not improve (P7, P9, P10, P13). Similar to their inattention ratings, P9 and P10 rated their adolescent as “Not very” hyperactive throughout most of baseline and, thus, showed no potential for positive change. Of the 12 parents whose adolescents had potential for improvement, 10 parents (83%) reported a decrease in hyperactivity.

Six of these 10 parents reported treatment improvements that were maintained in follow-up (P2, P3, P4, P11, P12, P14), three reported a late treatment improvement (P1, P5, P6), and one reported improvements that were not maintained in follow-up (P6). Although data by mid-treatment and/or follow-up showed less variability at generally low frequencies for most parents, two of the parents’ reports were characterized by more inconsistency. For example, P6’s data revealed a downward trend in treatment until the final few weeks, where ratings increased. However, despite this peak in data at the end of treatment, the mean level of data in the second half of treatment was still considerably
lower in comparison to baseline levels. P14 reported an increase in adolescent hyperactivity at the start of follow-up in comparison to treatment, but these levels decreased and stabilized for the latter half of follow-up.
Figure 8. Parent Report of Adolescent’s Hyperactivity across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
Figure 8. Parent Report of Adolescent’s Hyperactivity across Baseline, Treatment and 6-month Follow-up

*Note.* Mean lines highlighted in blue.
Figure 8. Parent Report of Adolescent’s Hyperactivity across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
3.4.2 Adolescent self-report of hyperactivity. Visual analysis of data trends and mean levels in Figure 9 suggests that completing MYmind positively affected only a subsample of adolescents’ self-reported hyperactivity symptoms. Out of nine adolescents, four (44%) reported reduced hyperactivity levels from participating in MYmind. Two reported medium improvements (A4, A8), and another two indicated small improvements (A2, A9). Five adolescents reported no change in hyperactivity symptoms (A1, A3, A5, A6, A7). Data for these latter five adolescents are characterized by a high degree of variability and somewhat high frequencies across phases.

Of the four adolescents who revealed downward trends in hyperactivity, two of them reported treatment improvements that were maintained in follow-up (A2, A9), one adolescent indicated a late treatment improvement (A4), and one adolescent reported a positive change in treatment that was not maintained in follow-up (A8). Similar to her reports of inattention, however, A4’s pattern of responses for hyperactivity exhibited a high level of variability. For example, her follow-up data are, on average, much lower than her baseline and treatment data, but the upward trend in mid-follow-up suggests that she struggled to maintain the reduction in hyperactivity symptoms.
Figure 9. Adolescent Report of Hyperactivity across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
Figure 9. Adolescent Report of Hyperactivity across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
3.5 Adolescent Impulsivity.

3.5.1 Parent report of impulsivity in adolescents. Given that one parent completed two of these items each day because of her two adolescent participants, 14 instead of 13 parent reports are included in the analysis of adolescent impulsivity. Visual analysis of data trends and mean levels in Figure 10 denotes that participation in the MYmind treatment had a positive impact on parent-reported adolescent impulsivity, according to nine of the 14 parents (64%). Of these parents, one indicated a large treatment improvement (P12), two reported medium treatment improvements (P4, P11), and six indicated small treatment improvements (P1, P2, P3, P5, P6, P14). Five parents reported that their adolescents’ impulsivity symptoms did not improve at all (P7, P8, P9, P10, P13). Comparable to inattention and hyperactivity reports, the baseline ratings of P9 and P10 were predominantly in the “Not very” range and therefore, showed no potential for improvement. Thus, of the 12 parents whose adolescents did have potential to improve, nine parents (75%) reported reduced levels of impulsivity in their adolescents.

Analysis of participant profiles suggest that of the nine parents who reported a decrease in adolescent impulsivity, six parents reported treatment improvements that were maintained in follow-up (P2, P4, P6, P11, P12, P14), and three parents reported a late treatment improvement (P1, P3, P5). In follow-up, all nine of these parents reported consistently lower levels of adolescent impulsivity compared to baseline and the start of treatment.
Figure 10. Parent Report of Adolescent’s Impulsivity across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
Figure 10. Parent Report of Adolescent’s Impulsivity across Baseline, Treatment and 6-month Follow-up
Note. Mean lines highlighted in blue.
Figure 10. Parent Report of Adolescent’s Impulsivity across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
3.5.2 Adolescent self-report of impulsivity. Visual analysis of data trends and mean levels in Figure 11 illustrates that participating in MYmind had a minimal impact on adolescents’ self-reported impulsivity symptoms. Of the nine adolescents who completed MYmind, only three reported reductions in impulsivity levels (33%) and all three of these showed only small treatment improvements (A3, A4, A8). Data from the other six adolescents suggested no improvements (A1, A2, A5, A6, A7, A9).

Of the three adolescents who reported reductions in impulsivity, two of them reported late treatment improvements (A3, A4), and one adolescent reported a positive change in treatment that was not maintained in follow-up (A8). Similar to her hyperactivity ratings, data of A4 is much lower in follow-up than in baseline and treatment, however, there is an upward data trend in mid-follow-up.
Figure 11. Adolescent Report of Impulsivity across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
Figure 11. Adolescent Report of Impulsivity across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
3.6 Meditation Practice

3.6.1 Parent self-report of meditation practice. Visual analysis of data trends and mean levels in Figure 12 suggests that participation in the MYmind treatment had a prominent effect on parent-reported meditation practice. Patterns from 12 of 13 (92%) parents revealed substantial increases in meditation practice in treatment compared to baseline. However, a few parents had difficulty maintaining regular meditation practice in follow-up.

Although P1, P6, P11 and P12 reported practicing some meditation before MYmind was initiated, their baseline practice was inconsistent and/or for short durations, with the exception of P12. By mid treatment, almost all parents reported increases in both frequency and duration of meditation practice. Of the 13 parent participants, five parents indicated large increases (P1, P4, P7, P10, P13), six parents reported medium increases (P2, P3, P5, P9, P12, P14), one parent revealed a small increase (P6), and one parent reported that their meditation practice decreased after MYmind (P11). The majority of parents reported meditating almost every day, and some days for 20 minutes or more by the end of treatment.

Further analysis revealed that of the 12 parents who reported increased meditation practice, 10 parents reported increases that were maintained in follow-up (P1, P2, P3, P4, P5, P7, P8, P9, P12, P13, P14), and two parents reported an increase that was not maintained in follow-up (P6, P10). Some parents’ meditation practice persisted at the start of follow-up, but tapered off after a few months (P5, P9, P14). Nonetheless, for the majority of parents, meditation practice continued after treatment completion, albeit in some cases for shorter durations.
Figure 12. Parent Report of Meditation Practice across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
Figure 12. Parent Report of Meditation Practice across Baseline, Treatment and 6-month Follow-up
Note. Mean lines highlighted in blue.
Figure 12. Parent Report of Meditation Practice across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
3.6.2 Adolescent self-report of meditation practice. Visual analysis of data trends in Figure 13 indicates that participating in the MYmind treatment had a positive impact on adolescent-reported meditation practice. In comparison to baseline, eight of the nine adolescents (89%) reported considerable increases in their meditation practice by treatment completion. One adolescent reported a large increase in meditation practice (A9), six adolescents indicated medium increases (A1, A2, A3, A4, A5, A6), one adolescent reported a small increase (A7) and one adolescent reported no increases (A8). By the end of treatment, almost all adolescents were reporting more days meditating than not meditating, and A2, A3, A4, A5 and A6 reported practicing meditation every day consistently for at least two weeks.

Of the eight adolescents who reported improved meditation practice, six of them reported treatment increases that were maintained in follow-up (A1, A2, A4, A5, A7, A9), and two adolescents reported an increase in treatment that was not maintained in follow-up (A3, A6). Although most adolescents’ follow-up meditation practice was more variable and irregular than in treatment, levels were still higher than in baseline for almost all adolescents.
Figure 13. Adolescent Report of Meditation Practice across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
Figure 13. Adolescent Report of Meditation Practice across Baseline, Treatment and 6-month Follow-up

Note. Mean lines highlighted in blue.
3.7 Relationship Between Stress and Meditation Practice

Although visual analysis of meditation trends indicated that meditation practice increased over treatment and follow-up for the majority of participants, a statistical analysis of meditation practice was conducted on these data so that we could subsequently correlate meditation practice with stress levels.

To statistically explore whether the amount of meditation practice significantly varied across the three phases, GEE analysis with meditation practice as the dependent variable and phase as a factor predictor variable was conducted. Results from GEE analyses are interpreted similarly to results from ordinary least squares regression (multiple linear regression). However, Wald $\chi^2$ tests are used instead of t and F tests, and a measure of association (i.e., $R^2$) is not available. Gamma distribution and a log link function were selected for this analysis and the results indicated a significant difference in the amount of meditation practice among the three phases, Wald $\chi^2 (2)=103.72, p < .05$. Pairwise comparisons indicate that the average amount of meditation practice in Phase 1 (Baseline) is significantly smaller than in Phase 2 (Treatment) ($MD = -1.43, SE = 0.16$) and in Phase 3 (Follow-up) ($MD = -1.38, SE = 0.18$). The amount of meditation practice in Phases 2 and 3 are not significantly different. These results suggest that participants continued their meditation practice six months after completing treatment.

A subsequent analysis examining predictors of participant stress was conducted using the GEE procedure, with a gamma distribution and a log function. To fully explore the relationship between meditation practice and stress, all possible interactions and factors were included in the model. Specifically, to investigate whether adolescents or parents benefited more from the meditation practice, interaction terms between group
status and other covariates were added to the model. Given that the data collected in the current study was time-dependent (i.e., participants responded differently based on the amount of time spent in treatment), within subject responses are likely to be correlated. A failure to incorporate within-subject correlations into the analytic model leads to incorrect coefficients and standard errors (Ballinger, 2004). Thus, time was included as a covariate in the model. Additionally, phase was included in the model in order to determine whether the relationship between meditation practice and stress varied according to phase in the program (i.e., baseline, treatment, follow-up). Using backwards elimination, the least significant interaction term was dropped and the model re-estimated, a procedure, which continued until no more interaction terms could be eliminated.

Early results revealed no significant interaction effects across all variables, and no main effects for adolescent/parent status, or phase (see Table G1 in Appendix G). These findings indicated that the relationship between stress and meditation practice did not differ between adolescents and parents, and therefore adolescent/parent status was excluded as a covariate from further analysis. In the subsequent model, no significant interactions or main effects were found for phase, suggesting that the effects of meditation practice on stress levels did not vary across phases of treatment (see Table G2 in Appendix G). Results of the final model demonstrated a significant main effect for meditation practice ($\text{Exp}(B) = .96, p < .01$), whereby 1 point in meditation practice on the likert scale decreases stress by 4% (see Table 5). In general, findings from the GEE analysis suggest that the more participants meditated the less stress they experienced and this significant relationship did not vary across time, participant status or phase.
Table 3

**GEE Analyses: Examining the Relationship Between Stress and Meditation Practice, Main Effects Only.**

<table>
<thead>
<tr>
<th>Type of Predictor</th>
<th>B</th>
<th>SE</th>
<th>Wald $\chi^2$</th>
<th>OR</th>
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<td>Intercept</td>
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<td>126.01**</td>
<td>2.17</td>
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<td>Baseline$^a$</td>
<td>.24</td>
<td>.05</td>
<td>19.61**</td>
<td>1.27</td>
</tr>
<tr>
<td>Treatment$^a$</td>
<td>.23</td>
<td>.04</td>
<td>43.32**</td>
<td>1.26</td>
</tr>
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<td>Meditation Practice</td>
<td>-.04</td>
<td>.02</td>
<td>8.17*</td>
<td>.96</td>
</tr>
<tr>
<td>Time</td>
<td>-.00</td>
<td>.00</td>
<td>1.86</td>
<td>.99</td>
</tr>
</tbody>
</table>

*Note. OR = odds ratio.*

*p < .01, **p < .001.

*a Compared to Follow-up.

### 3.8 Consumer Satisfaction

Based on responses to items on the CSQ, both parents and adolescents reported high levels of treatment satisfaction. Means and standard deviations for each item are presented in Table 4. The mean satisfaction score across all areas of satisfaction was 4.39 (out of 5) for adolescents and 4.33 (out of 5) for parents. Overall, group leaders were viewed highly by both groups of participants. Data suggests that participants felt group leaders listened to and understood their concerns, and implemented the program effectively. The lowest mean ratings by parents were for the question: ‘To what degree has the MYmind program helped to improve your adolescent’s ADHD symptoms overall?’ The lowest mean ratings by adolescents were for the item: ‘To what extent has the MYmind program met your needs?’ Under the “General Comments” section, 10 of 13
parents and seven of nine adolescents reported an improved relationship with their family and/or an overall reduction in stress within the home. Seven parents also reported greater awareness of themselves and their children, while eight of nine adolescents reported that the effects generalized to their academic, artistic or athletic performance.
### Table 4

*Adolescent and Parent Satisfaction with the MYmind Program*

<table>
<thead>
<tr>
<th>Item</th>
<th>Adolescents</th>
<th>Parents</th>
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<tbody>
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<td></td>
<td>(n = 9)</td>
<td>(n = 13)</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
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<tr>
<td>Participants’ satisfaction with help received</td>
<td>4.44</td>
<td>0.53</td>
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<tr>
<td>The extent MYMIND improved participants' ability to deal with problems</td>
<td>4.33</td>
<td>0.71</td>
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<tr>
<td>Appropriateness of MYmind for treating participants’ ADHD symptoms and family conflict</td>
<td>4.67</td>
<td>0.50</td>
</tr>
<tr>
<td>The extent that MYmind met participant's needs</td>
<td>3.89</td>
<td>0.33</td>
</tr>
<tr>
<td>The extent the participants would recommend</td>
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<td>0.50</td>
</tr>
<tr>
<td>MYmind to others</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participants' confidence in ability to manage future conflicts</td>
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<td>0.44</td>
</tr>
<tr>
<td>Amount of change experienced by participants across areas of difficulty due to participation in MYmind</td>
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<td></td>
</tr>
<tr>
<td>Adolescents’ ADHD symptoms</td>
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</tr>
<tr>
<td>Participants’ ability to manage stress</td>
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</tr>
<tr>
<td>Parent-adolescent relationship</td>
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<td>0.50</td>
</tr>
<tr>
<td>Other personal problems</td>
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Chapter 4: Discussion

The present research involved an evaluation of a mindfulness-based training program for adolescents with ADHD, and their parents. There is growing evidence supporting mindfulness-based interventions as effective for a wide range of physical and mental health disorders in a range of populations (e.g., Baer, 2003). The current study contributed to the existing body of research by demonstrating the value of mindfulness for families struggling with increased conflict and stress due to the additional challenges experienced by youth with ADHD and their parents. Results from this multiple baseline evaluation indicated that participating in the MYmind program were associated with specific improvements for both parents and adolescents. Visual analyses of parent- and adolescent-reported data revealed reductions in parent and adolescent stress, parent and adolescent distress due to family conflict, and greater meditation practice. Most parents reported a decrease in their adolescents’ inattention, hyperactivity and impulsivity

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<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std Dev</th>
<th>Mean</th>
<th>Std Dev</th>
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<td>4.39</td>
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<td>Parent ratings of themselves as parents after MYmind</td>
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**Group Leader Abilities**

<table>
<thead>
<tr>
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<th>Mean</th>
<th>Std Dev</th>
<th>Mean</th>
<th>Std Dev</th>
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<td>Understanding participants’ concerns</td>
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<td>Understanding adolescents’ concerns (according to parent)</td>
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<td>Overall Mean</td>
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<td>4.33</td>
<td>0.40</td>
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</table>
symptoms after participating in MYmind, however, results were less consistent across adolescent responses. The majority of adolescents indicated no improvements in their ADHD symptomology in treatment and follow-up compared to baseline. However, both groups reported high satisfaction with the MYmind program overall.

Compared to behavioural and psychosocial programs, which have predominantly not been found highly effective for youth with ADHD and their families (MTA Cooperative Group, 2004a), the present study provides empirical support for mindfulness as a promising treatment for this population. Mindfulness is a self-regulatory skill involving observation of one’s own thoughts and feelings without judgment (Brown & Ryan, 2003), and appears to help adolescents with ADHD who have deficits with executive functioning (Oberle, Schonert-Reichl Lawlor, & Thomson, 2012). For example, due to difficulties with modulating emotions and inhibiting behaviours in these adolescents (Nigg, 2001), behavioural programs rooted in token economies and reinforcement may not adequately address such neurological deficits. However, cultivating mindful attention may be associated with improved executive functioning because it requires an individual to regulate the focus of attention while inhibiting the urge to act on thoughts and feelings that naturally arise in consciousness (Bishop et al., 2004). Thus, adolescents become more attuned to their emotions and cognitions, allowing them to disengage from impulsive reactions and adopt a more adaptive response to managing their stress, interactions and inattention (Brown & Ryan, 2003). Likewise, although most behavioural parent training approaches teach parents to modify their reactions to the aberrant behaviour of their ADHD children through reinforcement and problem-solving techniques (e.g., Abikoff et al., 2004), they do not improve parent
awareness of their automatic responses to emotional triggers or help them gain insight and empathy about the behaviour of their adolescent offspring. Thus, due to these unique mechanisms of action, mindfulness may have the potential as a more effective treatment for addressing the difficulties of adolescents with ADHD and their parents than more commonly prescribed behavioral and psychosocial interventions.

4.1 Reported Stress Outcomes

To evaluate the efficacy of participating in MYmind on parent and adolescent stress levels, all participants were asked to rate their daily experiences of stress over baseline, treatment and follow-up. Visual analyses of data trends and means suggest that compared to baseline, stress levels for 85% of parents and 89% of adolescents were greatly reduced by treatment completion. These low levels of stress remained fairly stable across follow-up for the majority of both groups, although some adolescents’ ratings peaked when school began in September.

4.1.1 Parent stress. Most parents reported fairly high and inconsistent levels of stress in baseline, which is not surprising given past research suggesting a relationship between stress and parenting youth with ADHD (Biondic, 2011; Theule et al., 2013). Compared to baseline, parent reports of stress were notably lower by the end of MYmind and in follow-up, which is similar to past findings on the effects of mindfulness-based parenting programs with children (e.g., Benn et al., 2012). However, the present findings extend the results of these studies by demonstrating these effects with parents of adolescents, who may be associated with even more stressors than children (Shek, 1998).

It appears that, as parents in the present research practiced mindfulness, they (1) became more aware and reflective of their automatic responses to common emotional
triggers before they arose, and (2) learned how to disengage and calm down more quickly from difficult interactions, allowing them to more effectively cope with their stress (e.g., Duncan et al., 2009; Singh et al., 2010). For example, in MYmind parents were taught that physiological stress reactivity can have physical signs (e.g., an increasingly rapid heart rate), and if they attempt to observe those signs, they can use meditative practices to alleviate their heightened emotions before responding (Benn et al., 2012).

Of the 11 parents who reported improvements in their stress levels, 10 indicated that they were able to continue to effectively cope with their stress six months after MYmind ended. Considering many stress management programs for parents of youth with ADHD are ineffective in reducing child-related parenting stress, especially long-term (e.g., Treacy et al., 2005), the maintenance of stress-related treatment effects in the present study is encouraging. Considering that parenting stress is associated with high attrition rates and poor use of strategies following treatment (Friars & Mellow, 2007; Kazdin, Mazurick, & Bass, 1993), the low levels of stress likely contributed to parents’ efforts to fully participate in treatment and to continually practice mindfulness strategies over time (Lanier et al., 2011).

4.1.2 Adolescent stress. Similar to parent stress reports in baseline, adolescent stress ratings were fairly high and variable. Given the academic and social deficits associated with ADHD adolescents, high stress reports were anticipated (Frazier et al., 2007; Kawabata et al., 2012). In comparison to baseline, eight of the nine adolescents reported experiencing less stress by the end of treatment and/or in follow-up. The present findings are the first to identify the potential value of using mindfulness to reduce stress in adolescents with ADHD. Mindfulness may be particularly appropriate for these
adolescents with poor emotion regulation because it cultivates a more adaptive appraisal of the cognitions and emotions that trigger stress, allowing adolescents to make use of more effective coping methods (Zylowska et al., 2008).

Unlike the consistent downward trend observed in parent stress ratings, some adolescents reported an increase in stress levels during follow-up when school resumed in September (at the start of follow-up for Groups 3 and 4; halfway through follow-up for Groups 1 and 2). Although the MYmind curriculum included strategies intended to help adolescents with school-related challenges as a result of their ADHD (e.g., how to focus their attention, how to manage their workload, etc.), the simultaneous increase in stress across adolescents in September suggests that MYmind may not have been sufficiently effective in preparing them for the transition back to school. Considering that social support plays an important role in helping adolescents cope with stress (Licitra-Kleckler & Waas, 1993), such assistance may have been sufficient in the home as a result of parent participation in MYmind. However, with no teacher involvement in the program, school supports may have been inadequate to assist adolescents in effective management of associated stressors.

4.2 Reported Distress due to Family Conflict Outcomes

Due to the lack of research in this area, we examined the impact of MYmind on parent-adolescent interactions. All participants were asked to rate their level of distress as a result of conflicts or interactions with their parent/adolescent everyday over baseline, treatment and follow-up. Visual analysis of data and means indicated that there was a downward trend in reports of distress from family conflict in 100% of parent reports.
(among those with real potential for change) and 78% of adolescent reports after treatment completion and/or in follow-up. These reduced distress ratings in follow-up, suggest that mindfulness may be an effective treatment for targeting parent-adolescent interactions.

4.2.1 Parent distress due to parent-adolescent conflict. Distress ratings in baseline were not as high as one might expect considering the high levels of conflict experienced by families of youth with ADHD (e.g., Babinski et al., 2011). In fact, baseline levels of distress from four parents were so low (below a distress mean level of 1.9) that they had almost no potential to improve. In contrast to past research, these parents may indeed feel that their interactions with their youth are not distressing. One alternative hypothesis for these low reported levels of distress is that parents of adolescents with ADHD may use an avoidance coping strategy (e.g., Goldstein et al., 2007), and thus, avoid interactions with their adolescents rather than making an effort to deal with their problem behaviour. Alternatively, since many of the MYmind parents reported experiencing ADHD symptoms themselves, including disorganization, they may have higher thresholds for disorganization in their adolescents, are poorer at monitoring adolescent behaviour and are less consistent disciplinarians (Weinstein, Apfel, & Weinstein 1998; Murray & Johnston, 2006).

In comparison to baseline, more than half of the parents’ reports of distress increased during the initial weeks of treatment. Considering the weekly attendance and regular home practice required to participate in MYmind, the additional responsibility and commitment expected of adolescents may have provided further issues about which parents and adolescents argued. For example, anecdotal comments from some MYmind
parents at the onset of treatment suggested that they struggled to persuade their adolescents to attend the sessions, as well as to meditate at home. The majority of parents were very motivated to seek help for their adolescents in MYmind, which may have conflicted with adolescent disinterest in full participation (e.g., Bussing et al., 2012).

This upward trend in early treatment may also be due to parents’ enhanced awareness of their emotions and thoughts during conflicts as a result of participating in MYmind. For example, in MYmind sessions 2 and 3, parents were asked to keep a log of their unpleasant events, pleasant events, and stressful situations with their youth as part of home practice. Parents likely became more alert to difficult situations early in treatment and more attuned to the distress they experienced as a result of them. In fact, the elevated distress may be perceived as a treatment effect because enhanced ability to self-monitor thoughts and emotions is a large part of mindfulness practice (Kabat-Zinn, 1990).

In the second half of treatment and/or follow-up, parents’ reports of distress due to family conflict were considerably lower compared to baseline and the onset of treatment, suggesting that intervention had a reductive effect on family conflict. Given the correlation between high parenting stress and over-reactive parent disciplinary practices (Theule et al., 2013), these lower conflict-related distress levels were likely affected by parents’ reduced stress, and visa versa. For example, less stress may have enhanced parents’ ability to adopt a more patient, empathic parenting style, which in turn led to improved parent-adolescent relationships, reduced conflict and stress. Moreover, MYmind also likely increased parents’ tolerance of negative emotions and enhanced their ability to let go of the expectations and attributions that were often the root of conflicts (Duncan et al., 2009). The enduring effects of MYmind in follow-up suggest that parents
were able to maintain their positive parent-adolescent interactions long-term, and continued to respond to disputes with empathy, compassion and acceptance.

4.2.2 Adolescent distress due to parent-adolescent conflict. Compared to baseline levels that were characterized by variability, adolescent conflict-related distress showed a downward trend during intervention with lower, more stable levels by treatment completion and/or follow-up. These reduced levels of conflict-related distress after MYmind may have been due to adolescents’ greater self-awareness and regulation of emotions following mindfulness practices (Tang et al., 2007). As a result of MYmind, adolescents with ADHD may have become more effective at empathically resolving conflict rather than impulsively reacting to social stressors related to interactions with parents.

Adolescents’ reduced levels of conflict-related distress were also likely affected by their parents’ reduced distress levels, as well as reports of lower stress levels by both parties. By cultivating mindfulness, both parents and adolescents may have become more self-aware and better able to disengage from the cognitive and emotional events that fueled impulsive reactions (Dumas, 2005). Through alleviation of the distress associated with their interactions, parents and adolescents may have had more positive experiences with one another, facilitating an improved relationship (Johnston & Jassey, 2007). Moreover, parents’ modeling of mindful emotion regulation is directly related to children’s emotion regulation (Valients, Lemer-Chafabt, & Reiser, 2007); when parents in the present study demonstrated mindful behaviour in their interactions, they may have promoted similar mindful responding in the adolescents.
4.3 Reported ADHD Symptomatology Outcomes in Adolescents

Adolescents and parents were asked to rate the adolescents’ experience of inattention, hyperactivity and impulsivity everyday over baseline, treatment and follow-up. Because similar patterns were observed across data for these three symptoms, they will be discussed together. Visual analysis of trends and means revealed that approximately 60-70% of parents reported a reduction in adolescent ADHD symptoms after treatment, whereas only 30-40% of adolescents reported improvements. These mixed results make it difficult to draw firm conclusions about the potential efficacy of MYmind for ameliorating these behavioral challenges.

4.3.1 Parent report of ADHD symptoms in adolescents. Although variable, most parent ratings of adolescent ADHD symptoms in baseline were not as consistently high as expected. These low parent reports may reflect the age-dependent decline in primary ADHD symptomology that children experience as they enter adolescence (Biederman, Mick, & Faraone, 2000; Langberg et al., 2008). Moreover, the majority of adolescents (78%) were on medication before and during treatment, which may have been effective in moderating ADHD-related behaviours.

These low parent reports may also be associated with an avoidant coping style, resulting in minimal interaction with their adolescent. If parents infrequently interact with their adolescents, they are unlikely to observe their ADHD symptoms on a daily basis. Moreover, parents in the current study anecdotally noted in treatment sessions that they did not know until that point in time that certain problems (e.g., excessive talking, jumping from subjects in a conversation, poor memory, etc.) were attributed to ADHD; this lack of knowledge about ADHD symptomatology may have led to under-reporting of
such ADHD behaviours on the DSQ in baseline. Further, the DSQ included one general question each for adolescent inattention, hyperactivity, and impulsivity, which may not have been as valid as measures that ask parents about each symptom through multiple more specific items. Thus, parents may have under-reported their adolescents’ ADHD because all behaviours related to each symptom were not clearly addressed in the DSQ questions.

Treatment data revealed that 60-70% of parents reported that their adolescents’ ADHD symptoms decreased after participating in MYmind and these effects were maintained in follow-up. Three previous studies investigating the MYmind program found significant reductions in parent-rated inattention and externalizing symptoms in children and adolescents with ADHD and/or behaviour disorders (Bogels et al., 2010; van de Weijer-Bergsma et al., 2011; van der Oord et al., 2012), however, their results were mixed. For example, only fathers reported improvements in van de Weijer-Bergsma et al. (2011), not mothers, and teacher reports in van der Oord et al. (2012) and van de Weijer-Bergsma et al. (2011) indicated no improvement.

Of note, P9 and P10 reported almost exclusively that their adolescent exhibited no ADHD-related behaviour from baseline to follow-up. These parents were husband and wife, and similar to the low levels of symptomatology that appeared in their DSQ ratings, their comments in treatment also revealed minimal stress or tribulation at home. However, in later MYmind sessions both parents disclosed experiencing stress and family discord, suggesting an initial desire to present favorably to the group that decreased once they felt more comfortable in their group interactions. Despite increased comfort, both parents
continued to report no problems in follow-up. Given the likely bias present in their responses across phases, it is difficult to draw any conclusions from their data.

4.3.2 Adolescent self-report of ADHD symptoms. Most adolescents felt that MYmind did not effectively address their ADHD-related difficulties, as only about one third reported reduced inattention, hyperactivity and impulsivity symptoms after participating in MYmind. These stable reports of ADHD symptoms across phases are in contrast to the reduced adolescent ratings of stress and family conflict. It appeared that adolescents were more effective at applying mindfulness skills to their relationships than to their executive functioning and impulsive behaviour. Moreover, due to their ADHD many adolescent participants struggled to remain still during meditations/yoga and to concentrate during discussions, making it more difficult for them to fully participate and benefit from the mindfulness activities.

These results are consistent with the increase in self-reported externalizing symptoms for adolescents with comorbid ADHD and LD following an intervention that involved mindfulness combined with martial arts training (Haydicky et al., 2012). These researchers suggested that the increase in symptoms may have been due to the enhanced awareness and self-monitoring skills that adolescents gained from participating in the mindfulness program. Similarly, the adolescents with ADHD in the study by van de Weijer-Bergsma et al. (2011), reported no positive changes in ADHD symptoms after completion of MYmind.

The above studies also found a discrepancy between parent and adolescent reports of the adolescents’ ADHD symptomatology. Research suggests that parents are more valid reporters of adolescents’ ADHD symptoms than self-report data (Hoza et al., 2004).
However, poor parent–adolescent agreement may not suggest unreliable or invalid 
reporting, but rather differences between parent and adolescent perceptions of ADHD-
related symptoms (Rasmussen et al., 2002). Parents likely rate their adolescents’ 
symptoms based on readily observed behavioural patterns (i.e., externalizing behaviours), 
whereas adolescents’ ratings are rooted in their internalized experiences, of which parents 
may be less aware (Vance et al., 2002). A qualitative study suggested that adolescents 
with ADHD perceived some of their difficulties as something ‘wrong with their mind’ 
that made them different from their peers (Kendall, Hatton, Beckett, & Leo, 2003). 
Therefore, while parents in the present study may have reported improvements in their 
adolescents’ hyperactive behaviours, adolescents may have continued to feel different 
and to experience trouble thinking.

4.4 Reported Meditation Outcomes

To evaluate whether participating in MYmind improved meditation practice, 
participants were asked to rate their time spent meditating across baseline, treatment and 
follow-up. Visual analyses of treatment data suggest that compared to baseline, 
approximately 90% of participants reported meditating more frequently and for longer 
durations. In follow-up, the duration of meditation decreased for some parents and 
adolescents. GEE analyses revealed that meditation practice was significantly correlated 
with reduced stress levels for both groups.

4.4.1 Parent meditation practice. Most parents had no previous experience with 
meditation prior to treatment and the few who did meditated inconsistently and mostly 
for short durations. All parents except one reported significant improvements in their
meditation practice over the course of treatment. By mid treatment, most parents were meditating almost every day, and some days for 20 min or longer.

These results were anticipated given the emphasis placed on meditation in treatment and the gradually increasing durations of meditation recommended in weekly home practice. In support of this recommendation, parents were provided with a range of meditations to practice at home, given a CD containing guided meditations, prompted as a group to brainstorm strategies to overcome barriers to their meditation practice, and sent daily text messages reminding them to meditate.

After treatment was completed, some parents reported less frequent and shorter meditation sessions. This finding is not surprising given that they were no longer receiving the supports provided in treatment. However, the majority of parents were still meditating more days than not over six months of follow-up, suggesting long-term treatment effects. At the booster session six weeks after treatment, parents conveyed that finding ways to embed meditation practice into their busy daily schedules was the largest obstacle to continued meditation practice.

**4.4.2 Adolescent meditation practice.** Almost all adolescents reported no meditation practice during baseline; the two who indicated that they meditated did so infrequently and for short durations. Over treatment, all adolescents but one reported improved meditation practice with increases in both frequency and duration. Given that youth with ADHD often have difficulty remaining still and concentrating for long periods of time, these positive results are promising. Similar to the parents, adolescents were given CDs with guided meditations, sent daily text message reminders and were encouraged to practice for a longer duration of time each week between sessions.
Additionally, the use of meditation among athletes and actors was also discussed with the adolescents to increase their motivation to practice for all areas of their life. Therefore, such improvements in meditation practice may also be due to the enhanced performances in other activities that adolescents associated with their meditation practice. Specifically, adolescents reported meditating before hockey, skateboarding or playing an instrument, which indirectly improved their subsequent performance.

In follow-up, less than half of the adolescents reported meditating as frequently and as long as they did during treatment. Nonetheless, almost all adolescents reported improvements in meditation practice compared to baseline.

**4.4.3 Relationship between meditation and stress.** In the present study, we sought to determine whether participants’ meditation practice predicted their stress levels. Results indicated that longer durations of meditation practice were significantly correlated with reductions in the stress experienced by adolescents and parents. These findings extend previous studies demonstrating the impact of meditation on stress and wellbeing (Baer et al., 2006; Speca et al., 2000). For example, a randomized clinical trial of MBSR conducted with adolescent psychiatric outpatients demonstrated that meditation practice was significantly correlated with reductions in a range of psychological symptoms, including anxiety and depression (Biegel et al., 2009). The present study contributes to emerging research emphasizing the importance of meditation practice in mindfulness-based programs.

**4.5 Limitations and Research Implications**

There are several limitations to the present study that suggest implications for
future research. First, this investigation involved a sample of only thirteen parents and nine adolescents. Given that the symptoms associated with ADHD vary significantly across youth (Nigg & Casey, 2005), the present sample size may have limited generalizability of the findings to the broader population of adolescents with ADHD and their families. However, it is important to note that, although the sample was too small to do a rigorous group comparison study, the current design allowed for a thorough evaluation of MYmind on individual participants. In fact, this sample size is considered large for time-series investigations, and provided the opportunity for examining the process, long-term outcomes, and experiential effects of the MYmind program.

The sample size presented an additional limitation related to the fact that only two-thirds of participants qualified as research and treatment “completers”, raising the possibility of selection bias. Participants who met inclusion criteria regarding treatment attendance, meditation practice and consistent DSQ completion may have differed in significant ways from those who did not meet criteria, and therefore were not included in the research.

Another concern with the current study involves the simultaneous conduction of parent and adolescent treatment groups, making it difficult to determine the relative contribution of each to the improvements demonstrated by participants. In fact, Singh et al. (2010) conducted a study with families of children with ADHD and examined the effects of parent mindfulness training alone and combined with child mindfulness training. They found that providing mindfulness training to the children added substantially to the improvements obtained through parent mindfulness training. Although preliminary, the Singh et al. (2010) study suggested that intervention for both
parent and child is important for optimal treatment effects. Further research examining the effects of independent treatment for parents and adolescents would help to determine the relative contribution of each to the improvements achieved.

A fourth drawback of the present study was that no data regarding parent ADHD symptomatology was collected. Given that many parents of children with ADHD have similar diagnostic features, assessing parent ADHD symptomatology prior to the onset of treatment and measuring the effect of MYmind on their symptoms throughout treatment would have provided additional information on the effects of mindfulness. Future research should include measures to collect diagnostic parent information, and evaluate parent outcomes to investigate whether mindfulness interventions successfully target ADHD in parents.

Fifth, the present study did not evaluate whether the treatment effects enhanced relationships with untreated family members (i.e., no data was collected regarding participant relationships with non-participant family members). Such data would provide information on whether mindfulness training can positively affect interactions with individuals who have not had similar training opportunities. In particular, given the increased conflict found in sibling relationships of children with ADHD (Mikami & Pfiffner, 2008), future studies should investigate whether the improved interactions associated with MYmind generalized to the adolescents’ sibling relationships.

Sixth, meditation in the current study was measured via participant self-reports of duration and frequency of meditation practices. However, time spent meditating and past experience with meditation are inadequate alternatives for true competency with meditation; it is the quality of meditation practice, not quantity, that produces improved
health-related outcomes (Caspi & Burleson, 2005). Other measurement methods, such as physiological measures (including heart rate variability or skin conductance), may be the most effective means of determining whether someone is meditating in a present and mindful manner that is likely to produce positive change (Caspi & Burleson).

Seventh, for the current study, we developed the Daily Symptom Questionnaire (DSQ) to collect data on participants. Given the absence of an assessment instrument that suited our purposes, the DSQ provided the information we sought for evaluating our specific hypotheses regarding MYmind. However, no data on the psychometric properties of the DSQ were collected. Data on the validity and reliability of the DSQ would have helped ensure the accuracy of the results obtained and should be collected in future studies.

Eighth, parents and adolescents were asked to rate inattention, hyperactivity, and impulsivity globally with one question per behavioural area. In contrast to most rating scales that include ratings of several more specific behaviours using multiple items, we relied on the measurement of the overall construct (e.g., inattention) to represent all related behaviours (e.g., difficulty concentrating). Although the three general items used allowed us to obtain daily ratings of each overall category of behaviors, they did not address the diversity of specific behaviours that adolescents struggle with, potentially reducing the validity of our measurement system. Although some research suggests that single-item self-report measures of clinical symptom severity (e.g., depression) and psychosocial functioning are significantly correlated with the total scores and individual item scores of longer measures (e.g., Zimmerman et al., 2006), no such data exists for measures of ADHD.
A final limitation of the current research involved the reliance on self-report data for evaluating the effectiveness of the intervention. Although most time-series designs include repeated live observations over time as the primary source of evaluative data (e.g., Ducharme & Drain, 2004), observations were not feasible in this study given the nature of the sample and the constructs being considered. Self-report questionnaires are generally deemed less reliable than observational data. Cassady (2001) discusses numerous potential sources of bias that can be caused by self-report data, including a selective memory, perception of time (confusing when an event actually occurred), exaggeration, and misattribution (attributing positive events to an internal cause and negative events to an external force). Self-report data may be even more of a concern with ADHD adolescents who tend to overestimate their abilities and underestimate the severity of their problems (Wiener et al., 2012). In addition, the desire to be seen as socially acceptable may have biased self-report data with some participants in the current study. For example, P9 and P10 almost exclusively reported that their adolescent demonstrated no ADHD-related behaviour from baseline to follow-up. Due to possible bias in their self-reports that was revealed anecdotally, it was difficult to draw conclusions from their data.

One of the strongest arguments against using self-report data is that administering questionnaires before and after (but not during) the intervention, as in pre-post designs, requires participants to rely on their memory, thus reducing the accuracy of their reports (Margetts, Vorster & Venterm, 2003). Research has shown that participants respond more accurately to questions about their behaviour the shorter the elapsed time between the report and the behaviour under consideration (Judd, Smith & Kidder, 1991; Whippie &
Richey, 1997). Thus, notwithstanding the use of self-report data in the present study, the daily time-series measurement precluded participant reliance on memory that frequently biases retrospective self-report data in pre-post designs. Moreover, pre-post designs require participants to report at only one point in time after treatment, which is likely not representative of their overall functioning across time (Lambert, Doucette & Bickamn, 2001). For example, a self-report can significantly vary depending on many variables (e.g., time or day it is given, participant’s current mood, etc.), and thus a single report may not be a valid outcome measure of general functioning after treatment. However, multiple self-reports, such as in the current study, will provide a more comprehensive picture of a participant’s behaviour over time without the potential influence of extraneous variables (Lambert et al.).

4.6 Clinical Implications and Conclusions

Results from the current study demonstrate that mindfulness is an effective approach for reducing stress and enhancing parent-adolescent interactions for adolescents with ADHD and their parents. No studies to date have investigated the impact of mindfulness on parent-adolescent interactions in families of youth with ADHD. Moreover, similar to past studies (Bogels et al., 2010; Haydicky et al., 2012; van de Weijer-Bergsma et al., 2011; van der Oord et al., 2012), the current investigation demonstrated that mindfulness may have some potential for treating ADHD symptoms in youth. However, results from adolescent reports were less encouraging than parent reports. Previous research has highlighted the discrepancy frequently found between parent and child/adolescent reports where youth self-report more symptoms than parents
It is important to note that the majority of adolescents were also taking medication while participating in the MYmind program. The discouraging reports from adolescents may suggest that MYmind did not provide many additional improvements to their daily ADHD symptoms beyond the effects of their medication. This explanation is particularly relevant given the low reported rates of ADHD in baseline and evidence from past studies indicating that medication is currently the most effective form of treatment for managing ADHD symptoms (Biederman & Farone, 2005). However, although medication may also have positive effects on the stress levels and negative parenting practices of parents raising youth with ADHD (Wells et al., 2000), it does not provide parents or adolescents with the skills, coping strategies or awareness required to change their automatic patterns long-term. Moreover, youth are more likely to discontinue medication or use it inconsistently during adolescence (Atzori et al., 2009). Consequently, mindfulness may be an important and necessary adjunct treatment to medication for managing the range of difficulties experienced by adolescents with ADHD and their parents.

In the current study, we asked participants to report on their experiences and symptoms for six months following completion of MYmind. These follow-up data provided evidence that the positive effects observed during treatment were maintained or improved after treatment ended. Unlike many psychosocial interventions for ADHD that result in inadequate maintenance of treatment effects (Abikoff, 2009), the results of the current study suggest that mindfulness may produce specific long-term positive outcomes.

During each MYmind session, participants discussed potential solutions to the obstacles they experienced during home practice, and a booster session was provided six
weeks after treatment. These supports likely contributed to the participants’ ability to uphold their mindfulness practice after the weekly MYmind sessions finished. Moreover, questionnaires were emailed throughout follow-up as a cue for reflection on daily experiences. By reviewing events at the end of each day, participants may have developed a habit of self-monitoring, a practice that enhances awareness of internal experiences (Williams et al., 2007). Daily self-reflection may have allowed participants to observe their automatic tendencies, facilitating their ability to respond differently to stressful situations well after intervention was completed.

Notwithstanding the multiple enduring effects observed in the present study, many adolescents reported elevated stress levels when school resumed in September. It appears that the intervention did not adequately prepare adolescents for managing the added stressors associated with beginning a new school year, a finding that is congruent with previous MYmind studies (van de Weijer-Bergsma et al., 2011; van der Oord et al., 2012) in which teachers reported no improvements following treatment. In the future, MYmind should include activities focusing on the school-related stressors (e.g., starting a new school, workload demands, exam time, etc.) and directly apply mindfulness practices to the achievement-related self-regulation required of students (Mendelson et al., 2010).

The use of time-series self-report measurement to assess the effects of MYmind on parent and adolescent behaviours was a unique feature of the present research. These daily self-reports allowed us to observe changes across key constructs over time. Mindfulness involves a gradual process of change through the development of greater awareness and acceptance that is not captured with a pre-post design. Criticisms of currently available pre-post measures of mindfulness suggest that self-assessment at one
time point does not grasp the full range of experiences associated with practicing mindfulness (Grossman, 2008). As a result, it may be beneficial to shift our focus from examining only discrete outcomes of mindfulness to the overall process across key areas of well-being.

In summary, the long-term efficacy of MYmind for parent-adolescent conflict and stress in families with ADHD will hopefully fill the need for treatments targeting the additional difficulties experienced by this population. Moreover, the use of time-series measurement provided a novel approach to measuring the effects of mindfulness programs in a more efficient and comprehensive way. The present research adds to the burgeoning field of mindfulness by demonstrating its associated positive effects with adolescents with ADHD and their parents. Given the breadth of populations and presenting problems for which mindfulness has been found effective, mindfulness-based approaches have been established as the third wave of behavioural and cognitive therapies, providing an alternative to the goal-oriented, behaviour-modification and symptom-change focus of early behaviourism (Hayes, 2004). This clinical focus on acceptance and awareness of difficult conditions that is the foundation of mindfulness may be the ideal antidote for managing the rapidly changing times that are adding so many new challenges to the lives of patients and their healthcare providers.
References


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Johnston, C. (1996). Parent characteristics and parent–child interactions in families of nonproblem children and ADHD children with higher and lower levels of


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Appendix A
Information Letter

What is MYmind: Mindfulness training for Youth with ADHD and their parents?

MYmind: Mindfulness training for Youth with ADHD and their parents is an 8-week group intervention for teenagers who have ADHD, and their parents. The goals of the program are to help teens manage their ADHD symptoms, to help teens and parents reduce their stress, and to reduce conflict and improve the quality of relationships between adolescents and their parents. The program involves meditation exercises and discussions about problem solving strategies. It has been previously evaluated by researchers in Holland and both parents and teens found it to be very helpful. Research has shown that mindfulness meditation has helped improve ADHD behaviours, such as inattention, impulsivity and oppositionality. Mindfulness also reduces stress and improves quality of life.

What do I have to do?

You will attend 8 weekly sessions, lasting approximately 1.5 hours. The parent and teens group will be running simultaneously, and sometimes come together as one large group. The sessions will take place at OISE, which is located at Bloor and St. George. The sessions are held on Saturday mornings. Both parents are invited to join the program, but at least one parent must commit to attending all 8 sessions. If you have more than one teenager with ADHD then both may be eligible to participate.

The research component will involve filling out questionnaires at 4 time points in sessions of approximately 1 hour. You will also receive daily email reminders to practice the mindfulness techniques and problem solving strategies at home. Because we will only be meeting weekly, it will be really important to practice what you’ve learned in sessions at home. Some people will be selected to complete a short questionnaire at this time and submit it via email nightly.

What about our privacy?

Your privacy will be respected. All questionnaire data are considered strictly confidential and will not be shared with anyone outside of the research group at OISE/UT. Any research reports that result from this study will be in a group format, with all identifying information of participants removed. There are a few instances where the researchers are required by law to breach confidentiality. In the event that an adolescent under 16 indicates that he or she is (in danger of) being harmed, we are obligated to inform his/her parents and the appropriate professionals, and/or make a report to appropriate child protection agencies. We also have a duty to report if we
have reason to believe that any participant, no matter their age, has intent to cause serious harm to him/herself or others.

What are the benefits?

In addition to contributing to scientific knowledge about ADHD and mindfulness meditation, there are several benefits that participants will receive from the study.

- Parents and youth participating may get personal benefit in the form of improved self-efficacy, reduction in problem behaviours, reduction in stress, and improved parent-child interactions.

- Dr. Wiener’s research group has created a web site for participants in her studies, communicating the results of the studies and providing links to resources for individuals with ADHD. The website is: http://adhdld.com

- Youth who are in high school will receive Community Service Certificates for the time they spend completing questionnaires in connection with this study (approximately 4-5 hours). Alternatively, youth can receive a small gift as compensation.

Are there any risks?

Other than investment of time, there are no known risks associated with participating in the study. One potential risk is that some people may feel some discomfort when answering questions about their relationships. You will be prepared for this situation during the consent procedure. You may skip any question, request a break, or withdraw from the study at any time without penalty. You are encouraged to speak with the group leaders if they need further support. The meditation practice may become uncomfortable or boring for some participants, but these issues usually subside with practice.

If you have any further questions, please contact adhdldresearch.oise@utoronto.ca or call us at (416) 978-0933
Appendix B
Parent and Adolescent Consent Form

Did you understand the explanation of the mindfulness program?
☐ yes ☐ no

Do you wish to participate in 8 weekly sessions, which includes filling out questionnaires at four different times?
☐ yes ☐ no

Do you understand that you will receive an email reminder every night, and you may be selected to complete a brief questionnaire at that time?
☐ yes ☐ no

Do you understand that you may skip a question, request a break, or stop participating in the research at any time?
☐ yes ☐ no

Name of participant: __________________________
Participant’s date of birth: Month: _____ Day:_____ Year:_____
Signature of participant: _______________________
Date: _______________________
Email and/or Cell Phone Number: ________________________
Appendix C
Demographics Questionnaire

Parent’s Name: ________________________________

Phone Number: ____________________________(Home)
___________________________(Cell)
___________________________(Work)

Would you (parent) prefer to complete the daily questionnaire via email or facebook?

Parent Email: ________________________________

Parent Contact Name on Facebook: ________________________________

Adolescent’s Name: ________________________________

Adolescent’s D.O.B.: /______/_______ Age: _______ Grade: _______ 

dd/mm/yy

Home Address: __________________________________________
__________________________________________
__________________________________________

Will one or both parents be participating in the mindfulness program?

ONE 

BOTH

Please list the people currently living in your home:

<table>
<thead>
<tr>
<th>Name</th>
<th>Gender (M/F)</th>
<th>Age</th>
<th>Relationship to Child</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

Please list any immediate family members (parent, brother/sister) not currently living at home.

<table>
<thead>
<tr>
<th>Name</th>
<th>Gender (M/F)</th>
<th>Age</th>
<th>Relationship to Child</th>
</tr>
</thead>
<tbody>
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</tr>
</tbody>
</table>
What is your marital status?

Single  Married  Re-married  Common Law  Separated  Divorced  Widowed

Was your son/daughter diagnosed with ADHD/ADD?

YES        NO

If yes, what subtype of ADHD was your son/daughter diagnosed with (circle one)?

a) Inattentive
b) Hyperactive/impulsive
c) Combined I & HA/I
d) Unsure/don't remember

When was your son/daughter diagnosed?

Who diagnosed him/her?

Was your son/daughter diagnosed with LD?

YES        NO

When was your son/daughter diagnosed?

Who diagnosed him/her?

What is the nature of your son/daughter's LD (eg. Processing speed, fine motor, verbal language, fluency etc.)

Which academic areas are affected by your son/daughter's LD (eg. Language, math)

Does your son/daughter have any diagnoses besides ADHD or LD?

YES, Specify:________________________  NO

Has your son/daughter had any assessments/psychological evaluations?
YES  NO
If so, what kind of assessment and when were they tested?

Is your son or daughter currently taking any medication?
YES, Specify:_____________________________  NO

If your son or daughter takes medication for ADHD, do they take it on weekends?
YES  NO

Have you and/or your child received any treatment for your child's behavioural issues? (e.g. behaviour management training, parent management training, therapy)
YES, Specify type and date received:_____________________________  NO

Have you and/or your child received and treatment/intervention for family issues? (e.g. family therapy, couples counseling)
YES, Specify type and date received:_____________________________  NO

Do any members of the family (immediate or extended) have an ADHD diagnosis?
YES (Specify member of family)____________________  NO

Do you suspect that any members of the family (immediate or extended) have undiagnosed ADHD?
YES  NO
If yes, Who?
If yes, What makes you think that?

Is English your first language?  YES  NO
Is English your son/daughter’s first language?  YES  NO
Is there a language other than English spoken at home?  YES  NO
If yes, what other language(s) are spoken?

Was your child born in Canada?  YES  NO
If not, where was s/he born?____________________
How long has s/he lived in Canada?___________years
Were you born in Canada?  **YES  NO**
If not, where were you born? ___________________
How long have you lived in Canada? ___________ years

If applicable, was your spouse/partner born in Canada?  **YES  NO**
If not, where was s/he born? ___________________
How long has s/he lived in Canada? ___________ years

What is the highest level of education that you completed?
1. No schooling
2. Some elementary
3. Completed elementary
4. Some secondary
5. Completed secondary
6. Some college
7. Completed a college program
8. Some university
9. Completed an undergraduate university degree
10. Master’s degree
11. Doctoral degree

If applicable, what is the highest level of education that your partner/spouse completed?
1. No schooling
2. Some elementary
3. Completed elementary
4. Some secondary
5. Completed secondary
6. Some college
7. Completed a college program
8. Some university
9. Completed an undergraduate degree
10. Master’s degree
11. Doctoral degree

What kind of work do you and your spouse/partner (if applicable) do?

You: ___________________________  Full time
Part time
Currently unemployed

Spouse/ Partner: ___________________________  Full time
Part time
Currently unemployed
Appendix D
Daily Symptom Questionnaire - Parent version

Please place an X beside the rating that best describes your feelings and behaviours and those of your son/daughter today.

1.) How much stress were you feeling in general today?
   _ (Almost none) _ (A Little) _ (Some) _ (Quite a bit) _ (A lot)

2.) How much time did you spend with your son/daughter today?
   _ (Almost none) _ (less than 1 hour) _ (2-3 hours) _ (4-5 hours)
   _ (more than 5 hours)

3.) How much distress did you experience as a result of interactions/conflicts with your son/daughter today?
   _ (Almost none) _ (A Little) _ (Some) _ (Quite a bit) _ (A lot)

4.) How difficult was it for your son/daughter to pay attention (e.g., trouble listening, focusing) today?
   _ (Not very) _ (A Little) _ (Somewhat) _ (Quite a bit) _ (A lot)

5.) How restless (e.g., trouble sitting still, fidgeting, talking too much) was your son/daughter today?
   _ (Not very) _ (A Little) _ (Somewhat) _ (Quite a bit) _ (A lot)

6.) How impulsive (e.g., acting before thinking) was your son/daughter today?
   _ (Not very) _ (A Little) _ (Somewhat) _ (Quite a bit) _ (A lot)

7.) How long did you meditate today?
   _ (Not at all) _ (5 min) _ (10 min) _ (15 min) _ (20 min or more)
Daily Symptom Questionnaire - Adolescent version

Please place an X beside the rating that best describes your feelings and behaviours today.

1.) How much stress were you feeling in general today?
   _(Almost none)  __(A Little)  __(Some)  __(Quite a bit)  __(A lot)

2.) How much time did you spend with your parent today?
   _(Almost none)  __(less than 1 hour)  __(2-3 hours)  __(4-5 hours)  _(more than 5 hours)

3.) How much distress did you experience as a result of interactions/conflicts with your parent today?
   _(Almost none)  __(A Little)  __(Some)  __(Quite a bit)  __(A lot)

4.) How difficult was it for you to pay attention (e.g., trouble listening, focusing) today?
   _(Not very)  __(A Little)  __(Somewhat)  _(Quite a bit)  __(A lot)

5.) How restless (e.g., trouble sitting still, fidgeting, talking too much, just feeling restless inside) were you today?
   _(Not very)  __(A Little)  __(Somewhat)  __(Quite a bit)  __(A lot)

6.) How impulsive (e.g., acting before thinking) were you today?
   _(Not very)  __(A Little)  __(Somewhat)  _(Quite a bit)  __(A lot)

7.) How long did you meditate today?
   _(Not at all)  _(5 min)  _(10 min)  _(15 min)  _(20 min or more)
Appendix E
Instructions for Completing the Parent Questionnaires

Below is a list of explanations of what each rating means in order to help you fill out the daily email questionnaires. Please feel free to print it out and have it as an aid to help you in rating your own and your adolescent's feelings and behaviours.

1. How much stress were you feeling in general today?

   ____ (Almost none)   ____ (A little)   ____ (Some)   ____ (Quite a bit)   ____ (A lot)

   “Almost None” means that you were calm and relaxed overall today.
   “A little” means that you were fairly calm, and only mildly bothered by events today.
   “Some” means that you were agitated by events today, but it did not greatly disrupt your day.
   “Quite a bit” means that you were upset and disturbed today and you had a difficult time carrying out your day.
   “A lot” means you were frantic, panicked and felt out of control today and could not manage to get through the day.

2. How much time did you spend with your son/daughter today?

   ____ (Almost none)   ____ (less than 1 hour)   ____ (2-3 hours)   ____ (4-5 hours)   ____ (more than 5 hours)

3. How much distress did you experience as a result of interactions/conflicts with your son/daughter today?

   ____ (Almost none)   ____ (A little)   ____ (Some)   ____ (Quite a bit)   ____ (A lot)

   “Almost none” means that you had mostly positive feelings during your interactions with your adolescent today.
   “A little” means that you experienced minimal annoyance or frustration while interacting with your adolescent today, but those feelings did not last very long.
   “Some” means that you experienced some frustration while interacting with your adolescent today and it may have turned into a mild conflict(s).
   “Quite a bit” means that you experienced anger and aggravation after getting into a conflict(s) with your adolescent today, and it affected your mood for the rest of the day.
   “A lot” means that you experienced so much aggravation and fury from interacting with your adolescent you were not able to carry on with your day because the conflict(s) affected you so much.

4. How difficult was it for your son/daughter to pay attention (e.g., trouble listening, focusing) today?

   ____ (Not very)   ____ (A little)   ____ (Somewhat)   ____ (Quite a bit)   ____ (A lot)
“Not Very” means your adolescent was able to concentrate and listen attentively today with almost no difficulty. 
“A little” means that your adolescent was mostly able to concentrate and listen attentively today, even if support was provided (e.g., reminders, repetitions, prompts). 
“Somewhat” means that your adolescent needed reminders and instructions to be repeated in order to concentrate and listen to what was being said, although still had some difficulty. 
“Quite a bit” means that your adolescent had a difficult time concentrating and listening attentively, even if support was provided (e.g., reminders, repetitions, prompts). 
“A lot” means your adolescent could not listen attentively (e.g., did not hear anything said to him/her) or concentrate (e.g., was very distracted), even if support was provided (e.g., reminders, repetitions, prompts).

5. How restless (e.g., trouble sitting still, fidgeting, talking too much) was your son/daughter today?

___(Not very) ___(A little) ___(Somewhat) ___(Quite a bit) ___(A lot)

“Not Very” means your adolescent was able to wait for his/her turn, sit still and speak about one topic at a time today with almost no difficulty. 
“A little” means that your adolescent was sometimes able to wait for his/her turn, sit still and speak about one topic at a time today, when support was provided (e.g., reminders, prompts). 
“Somewhat” means that your adolescent had some trouble waiting for his/her turn, sitting still, and staying on one topic before jumping to the next today, and reminders or prompts would only sometimes help. 
“Quite a bit” means that your adolescent had a difficult time waiting for his/her turn, sitting still and speaking about one topic at a time today, and reminders or prompts would only occasionally help. 
“A lot” means your adolescent was very impatient, could not wait for his/her turn, could not sit still and demonstrated excessive talking today, even if support was provided (e.g., reminders, prompts).

6. How impulsive (e.g., acting before thinking) was your son/daughter today?

___(Not very) ___(A little) ___(Somewhat) ___(Quite a bit) ___(A lot)

“Not Very” means your adolescent was able to take time and think before acting today with almost no difficulty. 
“A little” means that your adolescent was sometimes able to take time and think before acting today, when support was provided (e.g., reminders, prompts). 
“Somewhat” means that your adolescent had some trouble taking time to think before acting today, and reminders or prompts would only sometimes help. 
“Quite a bit” means that your adolescent frequently acted without thinking first today, and reminders or prompts would only occasionally help. 
“A lot” means your adolescent was very impulsive and acted spontaneously today.
without thinking first at all, even if support was provided (e.g., reminders, prompts).

7. How long did you meditate today?

   ___(Not at all)   ___(5 mins)   ___(10 mins)   ___(15 mins)   ___(20 mins or more)
Instructions for Completing the Adolescent Questionnaires

Below is a list of explanations of what each rating means in order to help you fill out the daily email questionnaires. Please feel free to print it out and have it as an aid to help you in rating your feelings and behaviours.

1. How much stress were you feeling in general today?
   ____ (Almost none)  ____ (A little)  ____ (Some)  ____ (Quite a bit)  ____ (A lot)

   “Almost None” means that you were calm and relaxed overall today.
   “A little” means that you were fairly calm, and only mildly bothered by events today.
   “Some” means that you were agitated by events today, but it did not greatly disrupt your day.
   “Quite a bit” means that you were upset and disturbed today and you had a difficult time carrying out your day.
   “A lot” means you were frantic, panicked and felt out of control today and could not manage to get through the day.

2. How much time did you spend with your parent today?
   ____ (Almost none)  ____ (less than 1 hour)  ____ (2-3 hours)  ____ (4-5 hours)  ____ (more than 5 hours)

3. How much distress did you experience as a result of interactions/conflicts with your parent today?
   ____ (Almost none)  ____ (A little)  ____ (Some)  ____ (Quite a bit)  ____ (A lot)

   “Almost none” means that you had mostly positive feelings during your interactions with your parent today.
   “A little” means that you experienced minimal annoyance or frustration while interacting with your parent today, but those feelings did not last very long.
   “Some” means that you experienced some frustration while interacting with your parent today and it may have turned into a mild conflict(s).
   “Quite a bit” means that you experienced anger and aggravation after getting into a conflict(s) with your parent today, and it affected your mood for the rest of the day.
   “A lot” means that you experienced so much aggravation and fury from interacting with your parent you were not able to carry on with your day because the conflict(s) affected you so much.

4. How difficult was it for you to pay attention (e.g., trouble listening, focusing) today?
   ____ (Not very)  ____ (A little)  ____ (Somewhat)  ____ (Quite a bit)  ____ (A lot)
“Not Very” means you were able to concentrate and listen attentively today with almost no difficulty.
“A little” means that you were mostly able to concentrate and listen attentively today, even if support was provided (e.g., reminders, repetitions, prompts).
“Somewhat” means that you needed reminders and instructions to be repeated in order to concentrate and listen to what was being said, although still had some difficulty.
“Quite a bit” means that you had a difficult time concentrating and listening attentively, even if support was provided (e.g., reminders, repetitions, prompts).
“A lot” means you could not listen attentively (e.g., did not hear anything said to him/her) or concentrate (e.g., was very distracted), even if support was provided (e.g., reminders, repetitions, prompts).

5. How restless (e.g., trouble sitting still, fidgeting, talking too much) were you today?

   ___(Not very)   ___(A little)   ___(Somewhat)   ___(Quite a bit)   ___(A lot)

“Not Very” means you were able to wait for your turn, sit still and speak about one topic at a time today with almost no difficulty.
“A little” means that you were sometimes able to wait for your turn, sit still and speak about one topic at a time today, when support was provided (e.g., reminders, prompts).
“Somewhat” means that you had some trouble waiting for your turn, sitting still, and staying on one topic before jumping to the next today, and reminders or prompts would only sometimes help.
“Quite a bit” means that you had a difficult time waiting for your turn, sitting still and speaking about one topic at a time today, and reminders or prompts would only occasionally help.
“A lot” means you were very impatient, could not wait for your turn, could not sit still and demonstrated excessive talking today, even if support was provided (e.g., reminders, prompts).

6. How impulsive (e.g., acting before thinking) were you today?

   ___(Not very)   ___(A little)   ___(Somewhat)   ___(Quite a bit)   ___(A lot)

“Not Very” means you were able to take time and think before acting today with almost no difficulty.
“A little” means that you were sometimes able to take time and think before acting today, if support was provided (e.g., reminders, prompts).
“Somewhat” means that you had some trouble taking time to think before acting today, and reminders or prompts would only sometimes help.
“Quite a bit” means that you frequently acted without thinking first today, and reminders or prompts would only occasionally help.
“A lot” means you were very impulsive and acted spontaneously today without thinking first at all, even if support was provided (e.g., reminders, prompts).
7. How long did you meditate today?

___(Not at all)   ___(5 mins)   ___(10 mins)   ___(15 mins)   ___(20 mins or more)
Appendix F
Parent Consumer Satisfaction Questionnaire

The following questionnaire is part of our evaluation of the MYmind program that you have received. It is important that you answer as honestly as possible. The information obtained will help us to evaluate and continually improve the program we offer.

Your co-operation is greatly appreciated!

Please circle the appropriate response that best expresses how you feel.

A. THE OVERALL PROGRAM

1. How satisfied are you with the help you received?

very dissatisfied dissatisfied neutral satisfied very satisfied

2. To what degree has the MYmind program helped you to deal with your problems?

Not at all A little Somewhat Quite a bit A lot

3. I feel the approach to treating adolescent’s ADHD difficulties and parent-adolescent conflict using this type of training program is:

very inappropriate neutral appropriate very appropriate

4. To what extent has the MYmind program met your needs?

none of my needs a few of my needs some of my needs many of my needs almost all of my needs

5. Would you recommend the MYmind program to a friend or relative?

not recommend not recommend neutral recommend strongly recommend

6. To what degree has the MYmind program helped to improve your adolescent’s ADHD symptoms overall?

Not at all A little Somewhat Quite a bit A lot
7. To what degree has the MYmind program helped to improve your ability to manage your stress overall?
   Not at all   A little   Somewhat   Quite a bit   A lot

8. To what degree has the MYmind program helped to improve your relationship with your adolescent (e.g., how you resolve conflicts)?
   Not at all   A little   Somewhat   Quite a bit   A lot

9. To what degree has the treatment program helped with other general personal or family problems not directly related to your adolescent?
   Not at all   A little   Somewhat   Quite a bit   A lot

   Please briefly describe what those problems were:

   ________________________________________________________________
   ________________________________________________________________

10. How confident are you in your ability to manage future conflicts with your adolescent using what you have learned from this program?
    not at all   not very confident   neutral   confident   very confident

11. My overall feeling about the treatment program for my adolescent is:
    very negative   negative   neutral   positive   very positive

12. Overall, as a result of being in this program, how would you rate yourself as a parent?
    considerably worse   worse   the same   improved   greatly improved

13. Please write down any part of services you did not like.

   ________________________________________________________________
   ________________________________________________________________

B. GROUP LEADER
1. How well do you think your group leader listened to your concern(s)?

not at all well                  very well
                                 1--------2--------3--------4--------5

2. How well do you think your group leader understood your concerns?

not at all well                  very well
                                 1--------2--------3--------4--------5

3. How well do you think the adolescent group leader understood your adolescent’s needs?

not at all well                  very well
                                 1--------2--------3--------4--------5

4. How well do you think your group leader implemented the MYmind program?

not at all well                  very well
                                 1--------2--------3--------4--------5

C. GENERAL

1. Please comment on how this intervention affected you and your family.

   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

   THANK YOU VERY MUCH
Adolescent Consumer Satisfaction Questionnaire

The following questionnaire is part of our evaluation of the MYmind program that you have received. It is important that you answer as honestly as possible. The information obtained will help us to evaluate and continually improve the program we offer.

Your co-operation is greatly appreciated!

Please circle the appropriate response that best expresses how you feel.

D. THE OVERALL PROGRAM

1. How satisfied are you with the help you received?

very dissatisfied dissatisfied neutral satisfied very satisfied

2. To what degree has the MYmind program helped you to deal with your problems?

Not at all A little Somewhat Quite a bit A lot

6. I feel the approach to treating adolescent’s ADHD difficulties and parent-adolescent conflict using this type of training program is:

very inappropriate neutral appropriate very appropriate

7. To what extent has the MYmind program met your needs?

none a few some many almost all of my needs of my needs of my needs of my needs of my needs

8. Would you recommend the MYmind program to a friend or relative?

not recommend not neutral recommend strongly recommend

14. To what degree has the MYmind program helped to improve your ADHD symptoms overall?
<table>
<thead>
<tr>
<th>considerably worse</th>
<th>worse</th>
<th>the same</th>
<th>improved</th>
<th>greatly improved</th>
</tr>
</thead>
</table>

15. To what degree has the MYmind program helped to improve your ability to manage your stress overall?

Not at all | A little | Somewhat | Quite a bit | A lot

16. To what degree has the MYmind program helped to improve your relationship with your parent (e.g., how you get along)?

Not at all | A little | Somewhat | Quite a bit | A lot

17. To what degree has the treatment program helped with other areas of your life (e.g., sports, school, personal problems)?

Not at all | A little | Somewhat | Quite a bit | A lot

Please briefly describe what those areas were:

________________________________________________________________________

________________________________________________________________________

18. How confident are you in your ability to manage future conflicts with your parent using what you have learned from this program?

not at all confident | not very confident | neutral | confident | very confident

19. Please write down any part of services you did not like.

________________________________________________________________________

________________________________________________________________________

E. GROUP LEADER

1. How well do you think your group leader listened to your concern(s)?

not at all well | very well

1--------2--------3--------4--------5

2. How well do you think your group leader understood your concerns?
3. How well do you think your group leader implemented the MYmind program?

not at all well  very well

1-------2-------3-------4-------5

F. GENERAL

1. Please comment on how this intervention affected you and your family.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

THANK YOU VERY MUCH
Appendix G
Supplementary GEE Analyses

Table G1
GEE Analyses: Examining the Relationship Between Stress and Meditation Practice While Controlling for Adolescent/Parent Status and Phase

<table>
<thead>
<tr>
<th>Type of Predictor</th>
<th>B</th>
<th>SE B</th>
<th>Wald χ2</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>.88</td>
<td>.20</td>
<td>19.42*</td>
<td>2.40</td>
</tr>
<tr>
<td>Parentb</td>
<td>-.12</td>
<td>.24</td>
<td>.25</td>
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<tr>
<td>Baseline</td>
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<td>.10</td>
<td>14.61*</td>
<td>1.49</td>
</tr>
<tr>
<td>Treatmentb</td>
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<td>.14</td>
<td>.33</td>
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<td>7.00*</td>
<td>.85</td>
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<tr>
<td>Time</td>
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<td>.02</td>
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<td>2.62</td>
<td>1.01</td>
</tr>
<tr>
<td>Parent x Treatment x Meditation Practice x Time</td>
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<td>.00</td>
<td>.01</td>
<td>1.00</td>
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<tr>
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<td>.00</td>
<td>.20</td>
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<td>.07</td>
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Note. * p < .05.

a Compared to Adolescent.
b Compared to Follow-up.
c Compared to Adolescent x Follow-up x Meditation Practice.
d Compared to Adolescent x Follow-up x Time.
e Compared to Parent x Follow-up.
f Compared to Adolescent x Baseline.
g Compared to Adolescent x Treatment.

Table G2
GEE Analyses: Examining the Relationship Between Stress and Meditation Practice while Controlling for Phase

<table>
<thead>
<tr>
<th>Type of Predictor</th>
<th>B</th>
<th>SE B</th>
<th>Wald χ2</th>
<th>Odds Ratio</th>
</tr>
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<tbody>
<tr>
<td>Intercept</td>
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<td>42.61*</td>
<td>2.16</td>
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<tr>
<td>Baseline</td>
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<td>.17</td>
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<td>1.36</td>
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<td>Treatment</td>
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<td>.14</td>
<td>3.50</td>
<td>1.30</td>
</tr>
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<td>.03</td>
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<td>.93</td>
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<td>1.00</td>
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*Note.* *p* < .05.

$^a$ Compared to Follow-up.

$^b$ Compared to Follow-up x Meditation Practice.

$^c$ Compared to Follow-up x Time.

$^d$ Compared to Follow-up x Meditation Practice x Time.