

# Mindful Parenting Behaviors and Emotional Self-Regulation in Children With ADHD and Controls

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## Abstract

**Objective** Mindfulness is defined as paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally and these behaviors can be applied to parenting. Thus far, it is not understood whether mindful parenting (MP) differs in parents of children with and without attention-deficit/hyperactivity disorder (ADHD), and how MP relates to other parenting practices and children's self-regulation. **Methods** This study examined the relationships between MP, parenting behaviors and children's self-regulation in 120 families with child ADHD (85% male; mean age = 11.93) and 105 control families (62% male; mean age = 11.98). Parents completed measures of MP (Interpersonal Mindfulness in Parenting Scale), parenting behaviors (parenting warmth, consistency, and anger assessed with the Longitudinal Study of Australian Children measures), psychological distress (Kessler 6), and children's self-regulation (Social Skills Improvement System—self-control subscale). **Results** When compared with controls, parents of children with ADHD reported significantly lower MP. Higher MP was associated with lower levels of parent psychological distress, higher levels of parenting warmth and consistency, lower levels of parenting anger, and higher child emotion self-regulation in both groups. In mediation analyses, MP was indirectly associated with child emotion self-regulation through lower parenting anger, with the model accounting for 55% of the variance in child self-regulation. **Conclusions** MP is a useful construct for understanding parent behaviors, and children's emotion self-regulation.

**Key words:** ADHD; child emotion self-regulation; mindful parenting; parent anger.

## Introduction

Attention-deficit/hyperactivity disorder (ADHD) is a common neurodevelopmental disorder associated with impairments in multiple domains, including emotion self-regulation (Bunford et al., 2015; Langley

et al., 2010; Loe & Feldman, 2007). Studies have demonstrated that parents of children with ADHD experience high levels of parenting stress and have an increased risk for mental health disorders (Modesto-Lowe et al., 2008; Theule et al., 2013). Parents with

ADHD can struggle to maintain consistency in their parenting practices and to regulate their anger given the challenging nature of ADHD symptoms and behaviors (Edwards et al., 2001; Hawes, 2013; Kara et al., 2015).

Mindfulness is defined as paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally (Kabat-Zinn & Kabat-Zinn, 1997). Mindfulness principles can be applied to parenting (Bogels & Emerson, 2019), particularly for parents managing the stress associated with child mental health conditions. Such mindful parenting (MP) is associated with positive parent-child interactions (Duncan et al., 2009). Modeling of parent self-regulation via MP may have flow on effects to children's self-regulation skills (McKee et al., 2018)—an area of vulnerability for children with ADHD (Bunford et al., 2015). Although mindfulness is associated with increased self-control, it is likely that MP is distinct from ADHD symptoms. The definition of mindfulness—paying attention to experiences in the present moment, on purpose and without judgment—goes beyond self-control, impulsivity, and other typical features of ADHD. This study compares MP between the parents of children with and without ADHD and the association between MP and other parenting practices and child self-regulation.

When parents learn to pay mindful attention, they typically tune into their own emotions and thoughts, as well as their child's, leading to enhanced compassion, perspective taking, and responsiveness to others (Bogels & Emerson, 2019). Previous research on MP in nonclinical samples has demonstrated associations with positive parenting behaviors, including warm and responsive parenting, less parenting stress, less controlling, and harsh parenting (Gouveia et al., 2016), increased parent-child attachment, and greater overall child well-being (Medeiros et al., 2016). In addition, intervention studies in clinical and nonclinical settings have identified that MP interventions are associated with improved parenting, family relationships, and child functioning (Behbahani et al., 2018; Potharst et al., 2018; van der Oord et al., 2012).

Mindfulness may improve interpersonal relationships by enhancing emotion regulation and conflict management, in part through control over impulsive expressions of anger (Wachs & Cordova, 2007). MP programs emphasize the difference between response and reaction, with parents encouraged to take a less automatic and reactive stance towards their child. In a pilot study, parents who were randomized to receive a MP intervention reported improvements in anger management with medium size effect compared with the parenting program without MP (Coatsworth et al., 2010). More broadly, MP may be associated with child wellbeing through both reduced negative

parenting behaviors (i.e., anger) and increased positive parenting (e.g., parent warmth; Bogels & Emerson, 2019).

Child emotion self-regulation, in particular, is likely to benefit from the parenting behaviors associated with MP. Emotion self-regulation has been defined as the ability to modulate emotions, including emotion intensity and speed of escalation, to function optimally (Bunford et al., 2015). MP may allow children to learn effective ways to manage emotions from their parents, as well as reduce stress in the parent-child relationship, which is critical for children's emotion self-regulation (Sroufe, 2005). MP thus provides the optimal setting for children to learn emotion self-regulation skills, which is particularly important for children with ADHD. Emotion dysregulation is a significant contributor to functional impairment in children with ADHD, manifesting as difficulty managing negative emotions, such as anger—and positive emotions, such as over-excitement—leading to poor social and functional outcomes (Bunford et al., 2015).

As child self-regulation and optimal parent behaviors tend to be compromised in families with ADHD, children with ADHD may particularly benefit from MP. Parents of children with ADHD are at risk of psychopathology and stress (Modesto-Lowe et al., 2008), increasing the likelihood that they will struggle to demonstrate mindful, nonreactive parenting. Furthermore, parents of children with ADHD may share impulsive traits. Given that ADHD in adults has been associated with lower levels of mindfulness (Smalley et al., 2009), it is plausible that parents of children with ADHD display low levels of MP relative to parents of children without ADHD. However, we are unaware of research comparing MP to families of children with and without ADHD.

MP may exert both direct and indirect effects on children's emotion self-regulation, whereby a direct effect may be partially or fully mediated by parenting behaviors, including parenting warmth, consistency, and anger. It is important to consider MP in the context of other parenting behaviors, as findings have demonstrated lower parenting warmth and consistency and increased anger in parents of children with ADHD (Edwards et al., 2001; Hawes, 2013; Kara et al., 2015). The elucidation of these relationships in children with and without ADHD will allow empirical understanding of the way MP relates to parenting behaviors and children's regulatory skills. A recent review of meditation-based interventions indicates further research is needed (Evans et al., 2018). MP programs will be enhanced through consideration of how MP is connected to other aspects of parenting and child self-regulation.

The aims of this study were to examine: (a) differences in MP between families of children with and

without ADHD; (b) associations between MP, parenting behaviors, and child emotion self-regulation in children with and without ADHD; and (c) whether MP is associated with child emotion self-regulation through parenting behaviors, and to explore the moderating role of ADHD on these associations. It was hypothesized that: (a) families of children with ADHD would report lower levels of MP than families without ADHD; (b) in both groups, MP would be associated with higher levels of parenting warmth and consistency, lower levels of parenting anger, and higher levels of child emotion self-regulation; and (c) MP would be indirectly associated with child emotion self-regulation, through parenting behaviors. Differences between families of children with and without ADHD were explored.

## Materials and Methods

### Study Design

This study used data from a larger community-based longitudinal study of children with and without ADHD designed to identify risk and protective factors associated with poor versus better outcomes in children. The study methodology has been described previously (Sciberras et al., 2013). This study uses cross-sectional data from Wave 4 of this cohort study. Study approval was granted by the Human Research Ethics Committees of the Royal Children's Hospital, Melbourne (No. 31056), and the Victorian Department of Education and Early Childhood Development (No. 2011\_001095).

### Participants

Two hundred and twenty-five families participated in this study. Children meeting the full DSM-IV criteria for ADHD at age 7 (Wave 1) and/or age 10 (Wave 3) were included in the ADHD group ( $N = 120$ ). Of the 120 children in the ADHD group, 72 (60%) met criteria at both waves, and 48 (40%) met criteria on one wave only. Children in the non-ADHD control group (Wave 1) that also did not meet diagnostic criteria for ADHD at age 10 (Wave 3) were included in the non-ADHD group ( $N = 105$ ).

### Original Recruitment Procedure

Participants were recruited from 43 government elementary schools in metropolitan Melbourne, Australia via a 2-stage screening and diagnostic confirmation procedure. At Stage 1, the Conners 3 ADHD Index (Conners, 2008) was distributed to the parents ( $N = 5,922$ ) of all second grade children (age 6–8 years) in participating schools. If parents consented, the child's teacher completed the same measure. Using completed parent and teacher surveys ( $N = 3,734$ ), children were defined as screening positive for ADHD

if the child was reported by the parent as having an ADHD diagnosis or the child scored above threshold on the Conners 3 ADHD Index by both parent and teacher report (boys scoring  $>75$ th percentile and girls scoring  $>80$ th percentile). Positive screens ( $N = 412$ ) were then matched on school and child sex to children screening negative (no diagnosis and below symptom thresholds by both parent and teacher report) for ADHD ( $N = 412$ ). At Stage 2, positive and negative screens were invited into the longitudinal study, which involved diagnostic confirmation using the Diagnostic Interview Schedule for Children-IV (DISC-IV) and baseline data collection (Wave 1). Overall 498 families consented to participate in the longitudinal follow-up. Positive screens were classified in the ADHD group if they meet the diagnostic criteria for ADHD on the DISC-IV, whereas negative screens were classified in the non-ADHD control group if they do not meet diagnostic criteria for ADHD on the DISC-IV. Assessments were administered by trained research assistants with at least a 4-year degree in psychology, blinded to child screening status.

### Follow-up

Children were re-assessed at three additional waves, each 18 months apart, totaling four waves of data collection, with ADHD status re-assessed at Wave 3. This study largely uses data from Wave 4, with the exception that ADHD and non-ADHD groups were defined based on Waves 1 and 3 assessments.

## Measures

### Mindful Parenting

The parent-reported Interpersonal Mindfulness in Parenting Scale (Duncan et al., 2009) was used to assess MP. The scale consisted of eight items assessing three proposed subscales: (a) present attention (two items; e.g., *I find myself listening to my child with one ear, because I am busy doing or thinking about something else at the same time*); (b) nonjudgment (three items; e.g., *I listen carefully to my child's ideas, even when I disagree with them*); and (c) nonreactivity (three items; e.g., *when I'm upset with my child, I notice how I am feeling before I take action*). Items are rated on a 5-point Likert scale from 0 = "never true" to 5 = "always true." Items are summed to create an overall MP score. Previous studies have demonstrated the scale's concurrent and discriminant validity (de Bruin et al., 2014; Duncan et al., 2009) as well as internal consistency reliability (Parent et al., 2016). In this study, the scale showed adequate internal consistency ( $\alpha = .72$ ).

### Parenting Behaviors

The warmth, consistency, and anger parenting scales from the Longitudinal Study of Australian Children

(Zubrick et al., 2014) were used to assess parenting behaviors. The warmth scale includes six items ( $\alpha = .89$ ; e.g., *how often did you have warm, close times together with this child?*) assessing responsive parenting, such as displays of affection and awareness of children's needs. The anger scale includes five items ( $\alpha = .77$ ; e.g., *How often are you angry when you punish this child?*) measuring irritable parenting, such as feelings of anger or frustration towards the child, and emotional reactivity. The consistency scale contains six items ( $\alpha = .77$ ; e.g., *How often do you think that the level of punishment you give this child depends on your mood?*) assessing the setting and consistent application of age-appropriate rules and expectation. Scales were rated on a 5-point Likert scale from 1 = "never/almost never" to 5 = "always/almost always." Items were summed with higher scores indicating greater levels of parenting warmth, consistency, or anger. The scales have acceptable internal consistency reliability and construct validity (Zubrick et al., 2014).

### Child Emotion Self-Regulation

Parents completed the self-control subscale from the Social Skills Improvement System (Gresham & Elliott, 2008). This subscale includes seven items ( $\alpha = .91$ ; e.g., *stays calm when teased, takes criticism without getting upset*). Items are rated from 0 = "never" to 3 = "almost always," with higher scores indicating better emotion self-regulation. The scale has strong reliability and moderately high convergent and discriminant validity (Gresham et al., 2011).

### ADHD Measures

Parents and teachers completed the 10-item Conners 3 ADHD index assessing ADHD symptom severity. Each item (e.g., *restless or overactive*) is rated from 1 = "never/seldom" to 3 = "very often," with higher summed item scores denoting more symptoms. This well-used scale has acceptable reliability and validity (Conners, 2008). Internal reliability in this study was excellent ( $\alpha = .96$ ). The ADHD module from the DISC-IV (Shaffer et al., 2000) was used to confirm ADHD diagnostic status. The DISC-IV assess DSM-IV-based criteria for ADHD and has demonstrated acceptable internal consistency reliability and moderate to good criterion validity (Shaffer et al., 2000).

### Parent Psychological Distress

The Kessler 6 is a 6-item self-report measure that assesses psychological distress experienced by parents. Items (e.g., *feeling hopeless, feeling helpless*) are rated on a 5-point scale from 0 = "none of the time" to 4 = "all of the time". Higher scores denote more symptoms of distress. The scale has acceptable internal consistency reliability and validity (Furukawa et al.,

2003) and in this study internal reliability was very good ( $\alpha = .78$ ).

### Conduct Problems

The conduct problem subscale from the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) was used to assess the presence of conduct problems. This subscale has 5 items (e.g., *often lies or cheats*) rated from 0 = "not true" to 2 = "certainly true." Higher subscale scores indicate more problems. The SDQ has good psychometric properties including satisfactory internal consistency, test-retest reliability, interrater agreement, and structural validity (Stone et al., 2010). In this study, internal reliability was very good ( $\alpha = .78$ ).

### Demographic Information

Socioeconomic status (SES) was measured using the postcode-based Socioeconomic Indexes for Areas (SEIFA), on which lower scores reflect greater disadvantage (Australian Bureau of Statistics, 2011). ADHD medication status, single-parent status, and primary carer education were assessed using single-item measures completed by parents. Data on child and primary carer age and sex were also collected.

### Data Analysis

Preliminary analyses were conducted to determine frequencies, means, and standard deviations for demographic variables. Independent samples t-tests and  $\chi^2$  tests were used to compare these variables between groups. Linear regressions were used to compare levels of MP between the two groups (Aim 1).

Pair-wise correlations were used to examine bivariate associations between MP, parent psychological distress, parenting behaviors, and child emotion self-regulation in the ADHD and non-ADHD groups (Aim 2). Non-parametric techniques were used as parent psychological distress and some parenting behaviors were skewed in either one or in both groups. Given that Pearson's correlations for normally distributed variables were discovered to be comparable to their non-parametric counterparts, Spearman's correlations were reported across all variables for consistency.

Parallel multiple mediations using the "product-of-coefficients" approach were used to examine whether MP was indirectly associated with child emotion self-regulation through parenting behaviors (Aim 3). Mediation analyses were run on the whole sample using the SPSS PROCESS macro (version 3.0), conducted with 10,000 bootstrap samples and with a 95% bias-corrected and accelerated bootstrap confidence interval (95% BCa CI). To examine whether results derived from mediation analyses differed between the ADHD and non-ADHD group, moderated analyses by group (i.e., ADHD vs. non-ADHD) were run on these models



**Table I.** Sample Characteristics for Families of Children with and without ADHD

	ADHD (N = 120) <sup>a</sup>	Non-ADHD (n = 105) <sup>b</sup>	<i>t</i> or $\chi^2$	<i>p</i>
Child characteristics				
Child age	11.93 (0.70)	11.98 (0.61)	-0.58	.56
Child sex (male), N (%)	85 (70.8)	62 (59.0)	3.43	.06
ADHD medication use, N (%)	21 (17.5)	—	—	—
Conduct problems (SDQ)	3.81 (1.89)	2.43 (0.83)	7.23	<.001**
Primary caregiver characteristics				
Age	42.26 (6.69)	43.14 (5.88)	-0.87	.39
Female, N (%)	111 (92.5)	97 (92.4)	0.001	.97
SES (SEIFA)	1019.84 (42.09)	1019.54 (47.22)	0.05	.96
Highest education level, N (%)			11.16	.004**
Did not complete high school	36 (30.0)	17 (16.2)		
Completed high school	45 (37.5)	32 (30.5)		
Completed university	38 (31.7)	55 (52.4)		
Single-parent status, N (%)	34 (28.3)	15 (14.3)	6.49	.01*
Psychological distress (K6)	6.38 (5.18)	2.80 (3.21)	6.32	<.001**

Note. SDQ = Strengths and Difficulties Questionnaire-parent report; SEIFA = Socio-Economic Indexes for Areas (population mean = 1,000, SD = 100); K6 = Kessler-6. All characteristics specified as *M* (SD) unless otherwise specified.

\**p* < .05 and \*\**p* < .01.

<sup>a</sup>*N* = 86–120.

<sup>b</sup>*N* = 70–105.

that is, moderated mediation analyses. Regressions within each mediation model were assessed to confirm that predictors were not affected by multicollinearity, and that residuals met assumptions of linearity, normality, and homoscedasticity.

Potential a priori confounding variables including child age, sex, conduct problems, parent education, SES, and single-parent families were controlled for in Aims 1 and 3. For these two aims, an additional sensitivity analysis was conducted, which included further controlling for parent psychological distress. All analyses were conducted with IBM SPSS Statistics for Windows, version 25.0.

## Results

### Sample Characteristics

Of 498 participating families from Wave 1,225 were included in this study based on grouping criteria and availability of complete data on the main predictor and outcome variables at Wave 4. A comparison of available sample characteristic data for the included and excluded sample revealed that children in the included sample were younger (*p* = .002), and parents reported on average higher psychological distress (*p* = .046) as compared with the excluded sample. No other differences were found between the included and excluded sample in terms of child and parent sex ratio, parent age, family SES, parent education, single-parent status, child conduct problems, and ADHD medication use.

Included sample characteristics are shown in Table I. No differences were found between children with ADHD and non-ADHD children in terms of age and sex, or parent age, sex, and SES. Children with ADHD had higher levels of conduct problems,

*t* = 7.23, *p* < .001, and were more likely to have parents who were single,  $\chi^2$  = 6.49, *p* = .01, had less education ( $\chi^2$  = 11.16, *p* = .004) and higher levels of psychological distress, *t* = 6.32, *p* < .001. Twenty-one children were taking ADHD medication at the time that data were collected for the study.

### Differences in MP Between Families of Children With and Without ADHD

In unadjusted analyses, parents of children with ADHD reported lower levels of MP compared with non-ADHD controls (see Table II). Following the first adjusted analysis, overall levels of MP remained lower in the ADHD group (*MD* = -1.37, 95% CI = [-2.45, -0.29], *p* = .01). After accounting for parent levels of psychological distress, overall levels of MP no longer differed between the two groups (*p* = 0.13).

### Associations Between MP, Parent Psychological Distress, Parenting Behaviors, and Child Emotion Self-Regulation in Families of Children With and Without ADHD

Bivariate associations between the main study variables are displayed in Table III. Within the ADHD group, higher levels of MP were associated with lower levels of parent psychological distress (*r*<sub>s</sub> = -.30, *p* < .01). In relation to parenting behaviors, MP was associated with higher levels of parenting warmth (*r*<sub>s</sub> = .45, *p* < .01), and parenting consistency (*r*<sub>s</sub> = .31, *p* < .01), and lower levels of parenting anger (*r*<sub>s</sub> = -.44, *p* < .01). MP was also associated with higher levels of emotion self-regulation in their children (*r*<sub>s</sub> = .29, *p* < .01). A similar pattern of associations was also found between MP and these variables (i.e., parent psychological distress, parenting behaviors, and child

**Table II.** *Unadjusted and Adjusted Mean Differences in Mindful Parenting Between Families of Children with ADHD and Non-ADHD Controls*

	Mean (SD)		Unadjusted			Adjusted <sup>a</sup>			Adjusted <sup>b</sup>		
	ADHD (N = 120)	Non-ADHD (N = 105)	MD [95% CI]	p	$\beta$	MD [95% CI]	p	$\beta$	MD [95% CI]	p	$\beta$
Mindful parenting	27.76 (3.64)	29.38 (3.43)	-1.61 [-2.55, -0.68]	.001**	-.22	-1.37 [-2.45, -0.29]	.01*	-.19	-0.84 [-1.91, 0.24]	.13	-.11

Note. MD = mean difference; CI = confidence interval;  $\beta$  = standardized beta.

<sup>a</sup>Adjusted for child age, sex, child conduct problems, parent education, socioeconomic status (SES), and single-parent families.

<sup>b</sup>Adjusted for child age, sex, child conduct problems, parent education, SES, single-parent families and parent psychological distress.

\* $p < .05$  and \*\* $p < .01$ .

emotion self-regulation) within the non-ADHD group (all  $p < .05$ ).

### Parallel Mediation Model: Examining Whether MP is Associated With Child Emotion Self-Regulation Through Parenting Behaviors

Given there were no changes in the pattern of results between our main analyses and sensitivity analyses that additionally adjusted for parent distress, we present results from the latter. Figure 1 shows the standardized path coefficients, standard errors,  $p$ -values, and CIs for the multiple mediation model, controlling for potential confounding variables, and parent distress. Comparable to initial associations found within both ADHD and non-ADHD groups, MP was associated with greater parenting warmth ( $\beta = .37$ ,  $p < .001$ ), parenting consistency ( $\beta = .22$ ,  $p < .001$ ), and lower levels of parenting anger ( $\beta = -.29$ ,  $p < .001$ ) in the overall sample. This adjusted mediation analysis revealed, however, that of these parenting behaviors, only parenting anger remained associated with lower levels of emotion self-regulation in children ( $\beta = -.39$ ,  $p < .001$ ). Further, parenting anger was the only parenting behavior that mediated the link between MP and child emotion self-regulation ( $\beta = .11$ ; 95% BCa CI = [0.06, 0.18]). After accounting for parenting behaviors, the relationship between MP and child emotion self-regulation attenuated, suggesting the occurrence of full mediation. The total mediation model accounted for 55% of the variance in child emotion self-regulation.

A moderated analysis by group (i.e., ADHD vs. non-ADHD) for this multiple mediation analysis revealed that most interaction terms were nonsignificant for the total sample indicating that the associations were similar for both ADHD and non-ADHD groups. A single significant interaction was found (Group  $\times$  Parenting anger,  $p = .002$ ) for child emotion self-regulation; with a stronger relationship between hostile parenting and child emotion self-regulation for non-ADHD controls ( $\beta = -.65$ ,  $p < .001$ ) than for children with ADHD ( $\beta = -.21$ ,  $p = .01$ ).

### Discussion

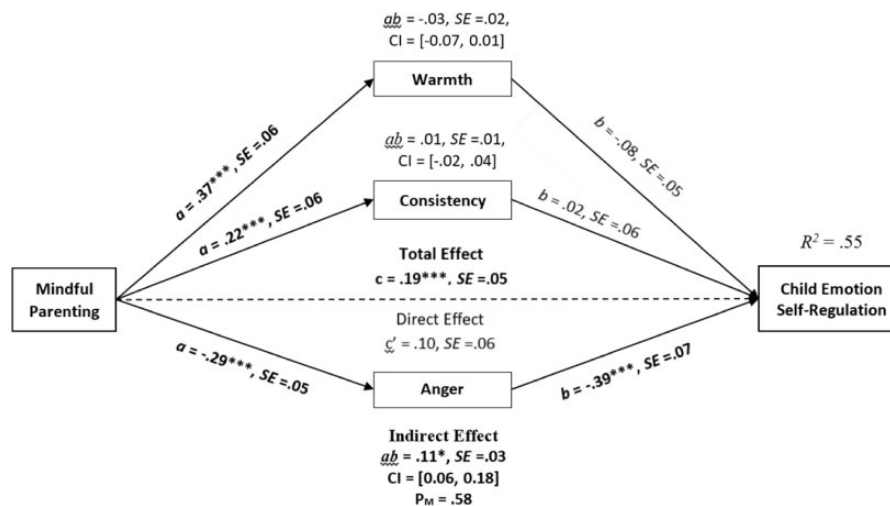
We found lower levels of MP in parents of children with ADHD compared with controls. As predicted, MP was associated with lower levels of parent psychological distress, higher levels of parenting warmth and consistency, and lower levels of parenting anger in both groups. In addition, MP was associated with higher levels of child emotion self-regulation in both groups. In mediation analyses, MP was indirectly associated with child emotion self-regulation, through parenting anger (not parenting warmth or consistency) in

**Table III.** Correlations Between Mindful Parenting, Parent Psychological Distress, Parenting Behaviors and Child Emotion Self-Regulation in Families of Children with ADHD and Non-ADHD Controls

		1.	2.	3.	4.	5.	6.
1.	Mindful parenting	—	-.21*	.38**	.29**	-.44**	.21*
2.	Parent psychological distress	-.30**	—	-.21*	-.27**	.28**	-.23**
3.	Parenting—warmth	.45**	-.26**	—	.21**	-.26**	.15
4.	Parenting—consistency	.31**	-.39**	.18*	—	-.50**	.28**
5.	Parenting—anger	-.44**	.49**	-.40**	-.50**	—	-.50**
6.	Child emotion self-regulation	.29**	-.39**	.21*	.27*	-.47**	—

Note. Bottom left are correlations within the ADHD group only ( $N = 120$ ); top right are correlations for non-ADHD controls ( $N = 105$ ).

\* $p < .05$  and \*\* $p < .01$ .



**Figure 1.** Parallel multiple mediator model with total ( $c$ ), direct ( $c'$ ) and indirect ( $ab$ ) associations between Mindful Parenting and Child Emotion Self-regulation through Parenting Behaviors (i.e., warmth, consistency, and anger);  $N = 220$ . Note. model adjusted for child age, sex, child conduct problems, parent education, socioeconomic status, single-parent families, and parent psychological distress. Values represent standardized path coefficients (and standard errors);  $SE$  = standard error,  $CI$  = 95% confidence interval; bolding denotes significance; \* $p < .05$ , \*\* $p < .01$ , and \*\*\* $p < .001$ .

both groups, with the model accounting for a large proportion of the variance in children's emotion self-regulation. Overall, the results highlight the importance of MP in understanding parent behaviors and children's emotion self-regulation.

To the authors' knowledge, this is the first time that levels of MP have been compared in families with and without ADHD. After accounting for child conduct problems, single-parent families, and SES, we found lower levels of MP in parents of children with ADHD; however, once parent psychological distress was adjusted for, there was no longer a difference in MP between the groups. The relatively high levels of psychological distress in parents of children with ADHD seem to drive the lower level of MP initially seen in parents of children with ADHD. It is also likely that other differences between families of children with ADHD and controls, including higher child conduct problems, and single-parent families, mean less resources for those parents to engage in MP related behaviors.

In both groups, MP was significantly associated with increased positive parenting behaviors (warmth and consistency) and reduced negative parenting behavior (anger) and child emotion self-regulation. These findings are consistent with previous literature, showing that MP is related to optimal parenting, including improved parent-child relationships, and calmer parent responses (Duncan et al., 2009; Gouveia et al., 2016). It is likely that paying attention to children's thoughts and feelings in a nonreactive manner develops parents' compassion and perspective taking (Bogels & Emerson, 2019), as well as parent emotion regulation skills, translating as less reactive anger (Wachs & Cordova, 2007).

The relationship seen here between MP and child self-regulation is consistent with previous cross-sectional associations between MP and child functioning in the general population. MP has been associated with reduced symptoms of anxiety and depression, and increased wellbeing in community samples of children (Geurtzen et al., 2015; Medeiros et al., 2016).

Our findings extend the relationship between MP and children's wellbeing, to include emotion self-regulation. Emotion self-regulation is critical for many life-tasks (Bunford et al., 2015). Emotion dysregulation in children with and without ADHD is associated with increased anxiety, depression, suicidal ideation, and risk taking behaviors such as alcohol and substance use in adolescence (Weinberg & Klonsky, 2009).

Our findings extend previous research demonstrating an association between MP and reduced risk taking behaviors in teens (Turpyn & Chaplin, 2016). Together, the findings indicate that the relationship between MP and children's self-regulation may emerge in childhood, translating into risky health behaviors later in adolescence. Future longitudinal research should examine the long-term relationship between MP and child self-regulation and risky behaviors to understand the causal trajectory of these variables. Our findings further add to the literature by suggesting that MP may be associated with children's emotion self-regulation through lower parent anger.

Prior research has largely failed to examine mechanisms explaining the relationship between MP and child functioning. We explored parenting behaviors, including warmth, consistency, and anger, as possible indirect effects. Even though there was a relationship between reduced MP and compromised parenting practices (low warmth and consistency, and increased anger), only parent anger emerged as a significant mediator in the relationship between MP and child emotion self-regulation. This model held when accounting for a number of covariates, including parent psychological distress, and was similar for both groups. Our results are consistent with previous research, demonstrating that mindfulness is associated with improved anger management (Coatsworth et al., 2010; Wachs & Cordova, 2007), and that MP is associated with reduced behavior problems in children from nonclinical and clinical settings (Potharst et al., 2018). Together, these findings suggest that MP is connected with children's functioning in a range of families.

Our moderation analyses found one group difference; specifically, in the strength of the parent anger and child emotion self-regulation link. Increased parent anger was more strongly associated with reduced child emotion self-regulation in the non-ADHD group. Given the relatively high levels of stress and psychopathology typically experienced in families of children with ADHD (Modesto-Lowe et al., 2008; Theule et al., 2013), this result may not be entirely surprising. Families without ADHD may not be as acclimatized to displays of parent over-reaction and anger, and hostility may be particularly distressing for these children, who may struggle to regulate emotions in the face of elevated parent anger.

It was interesting that positive parenting behaviors (warmth and consistency) did not emerge as significant mediators in our models. Although we replicated the significant association between MP and parent warmth seen in other studies, we failed to find a mediating role for parent warmth. The results from a recent cross-sectional mediation analysis of the relationships between parent mindfulness, positive and negative parenting and children's internalizing and externalizing problems highlight the particular role of negative parent behaviors (Parent et al., 2016). In this study, higher levels of parent mindfulness were indirectly related to lower youth internalizing and externalizing problems in part through lower levels of negative parenting (including reactive and angry parenting). In contrast, positive parenting behavior (including warmth) was not directly associated with externalizing symptoms, and only with internalizing symptoms in younger children aged 3–7 years. Our findings are also consistent with intervention literature highlighting the role of negative, but not positive, parenting as a mediator in children's problem behavior (Beauchaine et al., 2005; Fossum et al., 2009). Our findings add to this literature, indicating that MP may represent one strategy associated with less reactive parenting and better outcomes in children. Longitudinal studies are needed to determine this.

This study has a number of strengths including the community-based sampling and diagnostic interviews to assess ADHD status. We were thorough in our consideration of potentially confounding variables, accounting for key variables such as children's conduct problems, ADHD severity and parents' psychological distress. Thus the findings were not simply the result of parents experiencing symptoms of anxiety and depression. However, certain study limitations are worth considering, including the reliance on cross-sectional data which prevented understanding causal relationships. It is possible that in families with children who have low levels of emotion self-regulation, parents find themselves increasingly less mindful and engaging in less positive parenting behaviors. Future research requires a longitudinal examination of the directionality between MP and children's emotional regulation. Further intervention studies can also establish whether MP interventions are effective in improving children's emotion self-regulation. Another limitation of the study is the reliance on parent-reported measures. It is possible that parents were biased in their reports, and those experiencing low levels of MP reported more negative behavior in their children. If parents had negative perceptual biases, this might also explain why we only found a role for negative, and not positive parenting behaviors leading to child emotion self-regulation in models. Future studies require multi-informant analyses, verified by objective measures of



parent MP, parent behaviors, and child's emotion self-regulation. In addition, we only included families who completed the MP measure, and this may have introduced biases in terms of the type of families who had time to complete this measure.

Despite these limitations, this study offers novel insights into the relationships between MP, negative and positive parenting behaviors, and children's emotion self-regulation. A unique aspect of our study is the inclusion of both children with and without ADHD. Our use of these broad and narrow samples allows generalizability to the broader population, with prevention and treatment implications. In healthy families, fostering MP may equip parents with the skills to handle normative stressful events and prevent the emergence of excessive anger. In families of children with ADHD, MP may assist in managing parenting anger and may have flow on benefits to child self-regulation. Overall, our findings support the potential value of teaching MP skills to a broad range of families.

### Ethical Approval

This research was approved by Human Research Ethics Committees of the Royal Children's Hospital, Melbourne (No. 31056), and the Victorian Department of Education and Early Childhood Development (No. 2011\_001095). All procedures in the study involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its amendments or comparable ethical standards.

### Informed Consent

Informed consent was obtained from all participants.

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