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Mindful Parenting in Secondary Child Mental Health: Key Parenting Predictors of Treatment Effects

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Abstract

Objectives Emerging evidence supports the positive effects of mindful parenting as a clinical intervention in the context of child psychopathology; however, previous studies have not considered the specific parenting predictors of improvements in child outcomes.

Methods Parents accessing a child and youth secondary mental health care center participated in an 8-week mindful parenting training ($n = 89$). The effects of the mindful parenting training were assessed on parent-reported child's psychopathology, parents' own psychopathology, mindfulness, and parenting factors from pre- to post-intervention, 8-week and 1-year follow-up.

Results Multi-level analyses indicated immediate and delayed improvements in most child and parent outcomes. Changes in experiential avoidance in parenting partially predicted improvements in child internalizing problems. In combination with mindful parenting, experiential avoidance in parenting fully accounted for improvements in child attention problems. Changes in parental over-reactivity fully accounted for improvements in child externalizing problems.

Conclusions The mindful parenting training successfully improved the targeted (mindful) parenting factors, which in turn predicted improvements across different child outcomes.

Keywords Mindful parenting · Experiential avoidance · Child psychopathology · Parent psychopathology · Parenting · Parenting stress · Parental over-reactivity

Parenthood has intrinsic pleasures and privileges; however, parents also experience frustrations, fears, and failures (Bornstein 2002). As such, stress is a normal aspect of parenthood (Cmic and Greenberg 1990); negative emotions, such as guilt, are also seen as commonplace (Sutherland 2010). Parental stress arises

when there is a mismatch between perceived resources and actual demands of parenting, which can lead to negative feelings toward the self and child that are attributed to the role of parenting (Morgan et al. 2002). Parenting a child with additional needs (e.g., neurodevelopmental disorders, internalizing and externalizing problems) has been linked with increased levels of parental distress (e.g., Podolski and Nigg 2001; Ross et al. 1998).

Parental stress and psychopathology have been associated with negative parenting behaviors (e.g., hostility and controlling, Leinonen et al. 2003; non-physical punishment, Vostanis et al. 2006). Such negative parenting behaviors have been associated with child psychopathology (e.g., child anxiety and high levels of parental rejection and parental control; Bögels and Brechman-Toussaint 2006; Van der Sluis et al. 2015). Furthermore, the relationship between child psychopathology and parenting stress is influenced by parenting behaviors. In a longitudinal study of mothers of children at age 3 and 4 years, Assel et al. (2002) demonstrated that maternal stress predicted parenting behavior, including less displays of warmth and flexibility in interactions with their children. Consequently, these parenting behaviors then

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predicted less-developed social behavior in the children (self-initiated directing of others' attention). Leinonen et al. (2003) also demonstrated that parenting behaviors explained the predictive relationship between parent psychopathology and child adjustment, such that increased parent psychopathology led to increased negative parenting behaviors (e.g., punitive parenting), which in turn predicted adjustment problems in their children (e.g., substance use).

In this way, parenting can be viewed as one part of the environmental context to the development of internalizing and externalizing problems in childhood, with specific parenting factors deemed to be contextual risk factors to child psychopathology. One common response to difficult parenting experiences is over-reactivity. Externalizing disorders, characterized by problems such as inattention, defiance, impulsivity, and aggression (Morgan et al. 2002), have been consistently linked to over-reactivity in parenting. Over-reactivity in parenting refers to responses to problematic child behavior driven by anger, frustration, and meanness (Van den Akker et al. 2010). In a large prospective study, Miller-Lewis et al. (2006) demonstrated that over-reactive parenting was a common predictor of externalizing problems of children at age 6 years, as reported by both parents and teachers. Furthermore, over-reactivity in parenting and resulting harsh parenting behavior have been shown to be uniquely associated with externalizing, and not internalizing, problems in childhood (McLeod et al. 2007; Rothbaum and Weisz 1994; Van den Akker et al. 2010).

Parental over-control is another parenting practice that has been linked to child psychopathology, more commonly to child depression (Betts et al. 2009) and anxiety (Borelli et al. 2015; Ginsburg et al. 2004). Tiwari et al. (2008) suggested that over-controlling parenting behaviors may be a result of parental experiential avoidance. Parental experiential avoidance refers to a parent's inability to cope with their own internal distress in difficult parenting situations. Parents might be unwilling to witness their child experience negative emotions and unable to effectively manage their own reactions to their child's negative affect (Cheron et al. 2009). Thus, in an attempt to avoid their own distress, parents are likely to engage in practices such as over-controlling parenting behavior. Experiential avoidance in parenting may result in a child's vulnerability to internalizing problems, via parenting practices (Tiwari et al. 2008). Previous research supports this postulated link between parental experiential avoidance and anxiety in childhood. Cheron et al. (2009) reported that experiential avoidance in parenting was significantly associated with high levels of child anxiety in a sample of children with anxiety disorders. Consistent with the proposition that parental experiential avoidance could explain negative parenting behaviors (Tiwari et al. 2008), parental experiential

avoidance has also been linked to ineffective parenting behaviors that are known associates to child psychopathology, including, punitive and inconsistent parenting (Cheron et al. 2009; Shea and Coyne 2011). In the context of additional health needs of the child, parental experiential avoidance is also related to ineffective parenting behaviors, such as laxness and over-reactivity (Brown et al. 2014). However, little is known yet about the possible relationship between parental experiential avoidance and parental psychopathology in parents of children with a broader spectrum of diagnoses.

In contrast to negative parenting behavior, positive parenting practices have been positively associated with child development and behavior. Davidov and Grusec (2006) demonstrated that parents' sensitive responding to distress (comfort and helping) predicted better affect-regulation, empathy, and prosocial behavior in children aged 6–8 years. Parental responsiveness and compassion toward their child have been shown to be closely associated with mindful parenting (Geurtzen et al. 2015). As an extension of mindful awareness, mindful parenting is understood to be the awareness of present-moment parenting experience. Current definitions of the construct include the parent's efforts to self-regulate emotional and automatic reactions in the parenting context, in order to respond through choice in their actions rather than from emotional reactivity (Duncan et al. 2009; Smith and Dishion 2013). This capacity for self-regulation has been proposed to help parents to be less over-reactive and to parent in accordance with their parenting goals (Gouveia et al. 2016). In this sense, mindful parenting has shared features with psychological flexibility in parenting, which refers to the parent's ability to accept negative thoughts, emotions, and impulses that arise through parenting stress (Brassell et al. 2016). In this way, psychological flexibility is proposed as the other side of the same coin to parental experiential avoidance.

In their model of mindful parenting, Duncan et al. (2009) proposed that parents with higher levels of mindful parenting will display less negative parenting behavior (e.g., reactivity and harsh discipline) and more adaptive parenting behaviors (e.g., consistent discipline), and that through these parenting factors, children will display more positive outcomes (e.g., reduced externalizing problems). Similarly, Brassell et al. (2016) proposed that it is the presence of parental psychological flexibility (reduced experiential avoidance) that enables parents to maintain present moment and nonjudgmental awareness of their experiences. In turn, this awareness will allow parents to engage in adaptive parenting behaviors (i.e., less negative parenting behaviors). In comparison to negative parenting behaviors, mindful parenting has converse associations to parental stress and psychopathology; higher levels of mindful parenting have been associated with lower levels of stress and depression (Beer et al. 2013; de Bruin et al. 2014).

Furthermore, higher levels of mindful parenting have been associated with lower levels of negative parenting behaviors, such as laxness, overreactivity, and verbosity (de Bruin et al. 2014). Bögels et al. (2010) purported that it is through a decrease in parental stress, that higher levels of mindful parenting benefits parenting behavior and subsequently parental and child psychopathology. Gouveia et al. (2016) confirmed that higher levels of mindful parenting are associated with lower parental stress, decreased display of negative parenting behavior, and increased adaptive parenting. Moreover, recent studies have confirmed a mediating role of parent behavior on the association between child psychopathology and mindful parenting or parental psychological flexibility. In a study of different developmental age groups from 3 to 17 years, Parent et al. (2016) and Brassell et al. (2016) demonstrated the applicability of a mediation model relating to mindful parenting and parental psychological flexibility across development. Higher levels of mindful parenting and parental psychological flexibility (decreased experiential avoidance in parenting) were associated with adaptive parenting (decreased negative and increased positive parenting behavior), which in turn was related to decreased child psychopathology (internalizing and externalizing problems).

Interventions that increase mindful parenting and decrease experiential avoidance in parenting are also likely to improve parenting behavior and child psychopathology. One such example is the mindful parenting program (Bögels and Restifo 2014), an 8-week course that applies mindfulness training (training in meditative practices and everyday mindfulness) to reduce parental stress. As an extension of mindfulness-based therapy, mindful parenting training allows parents to bring an open, non-judgmental, and accepting attitude to their parenting (Bögels et al. 2008; Bögels et al. 2010). The effectiveness of the mindful parenting program in the context of child psychopathology is well-documented, with benefits to parenting behavior, as well as parent and child psychopathology. Following attendance at a mindful parenting program, parents have reported an increase in mindful parenting, a reduction in negative parenting behavior (control, overreactivity, overprotection, and rejection), and an increase in positive parenting behavior (autonomy granting behavior) (Bögels et al. 2014; van der Oord, Bögels, & Peijnenburg 2011). Completion of the mindful parenting program has conveyed benefits to parental psychopathology, including decreased stress and decreased internalizing and externalizing problems (Bögels et al. 2014; van der Oord, Bögels, & Peijnenburg 2011), and to their child's psychopathology, including decreased externalizing and internalizing problems (Bögels et al. 2014; Bögels et al. 2008; Van de Weijer-Bergsma et al. 2012; Van der Oord et al. 2012).

Similar benefits have been demonstrated in relation to interventions that target parental psychological flexibility. In a test of a parenting intervention that targeted parental experiential avoidance (acceptance and commitment therapy, ACT),

Brown et al. (2014) reported post-intervention improvements for parents of children with an acquired brain injury, on outcomes relating to ineffective parenting behaviors (overreactivity) and parenting stress. Specifically targeting limitations in mindful parenting and problematic experiential avoidance in parenting appears to convey subsequent benefits for parenting behavior and parent and child psychopathology. The specificity and proposed mechanism of interventions that improve mindful parenting have been alluded to in previous studies. In a mindful parenting intervention study for parents of children accessing secondary mental health care, Meppelink et al. (2016) demonstrated that a resulting increase in parents' mindful parenting, and not an increase in general mindful awareness, was a specific predictor of improvements in child internalizing and externalizing problems. Similarly, the significant benefits of ACT for parents reported by Brown et al. (2014) were explained by increased parental psychological flexibility (reduced parental experiential avoidance) in a full mediation model.

The aim of the study is to replicate and extend previous research on the effects of mindful parenting training. The study examines the processes targeted within the mindful parenting program, including mindful parenting, experiential avoidance in parenting, and specific parenting factors (parental over-reactivity and parenting stress). Following on from previous mindful parenting intervention studies (Bögels et al. 2014; Meppelink et al. 2016), it was hypothesized that following mindful parenting training parents would experience improvements in their child's and their own psychopathology, parental general mindfulness, and parenting factors (decreased parenting stress, decreased parental over-reactivity, decreased experiential avoidance in parenting, increased mindful parenting) across time points. Secondly, the study aimed to determine whether changes in these various parenting factors predict improved child psychopathology (internalizing, externalizing, and attention problems).

Method

Participants

Parents referred to one of four different child and youth secondary mental health care centers in the Netherlands were recruited to a mindful parenting training intervention. A total of 89 parents, with a child aged 1.5–18 years, participated in the two studies. Parent and child characteristics are reported in Table 1. Child diagnoses of autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), anxiety disorders, and parent-child relationship disorders were the most frequent (see Table 1).

Table 1 Participant characteristics

<i>Parent characteristics</i>	Intervention group (<i>n</i> = 89)
Parental age in years (<i>M, SD</i>)	43.36 (7.65)
Mothers	77.2%
Biological relationship parent-child	75.7%
Highest education	
Lower vocational	38.5%
Higher vocational/university	51.3%
Other	10.3%
Ethnic identity	
Dutch	84.1%
English	6.8%
Other	10.6%
Currently working part/fulltime	58.9%
Parent has a DSM-IV-TR diagnosis	10.2%
<i>Child characteristics</i>	
Child age in years (mean, <i>SD</i>)	10.17 (3.94)
Female children	34.9%
Child living with both parents	74.6%
Number of siblings (mean, <i>SD</i>)	1.65 (1.13)
Child has a DSM-IV-TR diagnosis	88.8%
<i>Primary DSM-IV-TR diagnosis child</i>	
Attention deficit hyperactivity disorder (ADHD)	29.2%
Adjustment disorder	4.4%
Anxiety disorders	11.2%
Autism spectrum disorder (ASD)	23.6%
Posttraumatic stress disorder (PTSD)	2.2%
Oppositional defiant disorder (ODD)	1.1%
Only a parent diagnosis present	6.6%
Parent-child relationship disorder	14.6%

Procedure

Approval for the first time period of data collection in this study was granted by the Ethical Committee of the University of Amsterdam; for the second time period, the Medical Ethical Commission of the Academic Medical Center of the University of Amsterdam granted approval.

Parents participated in the mindful parenting training program (as per the treatment manual, Bögels and Restifo 2014), which consisted of weekly 3-h sessions over an 8-week period, with an additional 1 h home meditation and mindful parenting practice daily, and a 3-h follow-up session 8 weeks after the end of the training. Children were not involved in the training. The intervention was delivered in four different locations: 58 (64%, five groups) participated in location A, 17 (19%, three groups) participated in location B, 12 (13%, three groups) in location C, and 3 (3%, one group) in location D. During the course of the study, families were permitted to also receive treatment as usual, although this was not encouraged and kept at a low

dose where possible. For location A, available data regarding treatment-as-usual were gathered. During the intervention period (between pre- and post-intervention), 46% of families accessed treatment as usual options, the most common of which were parental guidance or family therapy (32%), individual or group psychological treatment for the child (24%), and pharmacotherapy for the child (6%). Combinations of treatment were possible. The number of treatment-as-usual sessions for the 46% of families ranged from 1 to 13 ($M = 3.6$, $SD = 3.1$). During the follow-up period (between post-intervention and follow-up 1), 38% of families accessed treatment-as-usual options, including individual or group treatment for the child (24%), parental guidance or family therapy (18%), and pharmacotherapy for the child (10%). Again, combinations were possible. The number of sessions for the 38% of families ranged from 1 to 10 ($M = 3.1$, $SD = 2.7$).

Parent participants completed outcome measures at four time-points via an online survey: pre-intervention, post-intervention, 8-week follow-up, and 1-year follow-up. A sub-

sample of parents was placed on a 5-week + waitlist to participate in the mindful parenting training. An additional waitlist assessment was conducted for these parents; however, the data from this timepoint were minimal, and so were not included in the analysis here.

Measures

Child Psychopathology

The Dutch version of the Child Behavior Checklist (CBCL; 113 items) assessed parents' perceptions of their child's behavioral and emotional functioning (Achenbach and Rescola 2001). The CBCL child version was completed by parents of children 6–18 years; the CBCL infant version was completed by parents of children 1.5–5 years. Scores on the three CBCL scales were used in the present study: internalizing problems, externalizing problems, attention problems. Satisfactory reliability and validity have been reported for the Dutch version of the CBCL (Verhulst et al. 1996). Internal consistency for all three scales (across time points) was satisfactory (internalizing: $\alpha = .89-.95$; externalizing: $\alpha = .90-.94$; attention: $\alpha = .74-.85$).

Parent Psychopathology and Mindfulness

Parents' own behavioral and emotional functioning were assessed with the Adult Self Report (ASR; 123 items) (Achenbach and Rescola 2003). Scores on the three ASR scales were used in this study (Achenbach and Rescola 2003): internalizing problems, externalizing problems, attention problems. Satisfactory reliability and validity have been reported for the ASR (Achenbach and Rescola 2003). Internal consistency across scales (across time points) was satisfactory (internalizing: $\alpha = .88-.96$; externalizing: $\alpha = .85-.91$; attention: $\alpha = .84-.90$).

Parents' general mindful awareness was assessed with the shortened version of the Five-Facet Mindfulness Questionnaire (FFMQ; 24 items) (Baer et al. 2006; Bohlmeijer et al. 2011). This questionnaire measures mindful awareness across five facets (observing, describing, acting with awareness, non-judging of inner experiences, non-reactivity to inner experiences). Satisfactory validity and reliability have been reported for the FFMQ (Baer et al. 2006; de Bruin et al. 2012). Internal consistency (across time points) was satisfactory ($\alpha = .83-.96$).

Parenting Factors Parenting stress was assessed with the Competence scale of the Parenting Stress Index (PSI; 15 items) (Brock et al. 1992). Satisfactory reliability and validity have been reported for the Dutch version of the PSI (Dekovic et al. 1996). Satisfactory internal consistency (across time points) was observed in this study ($\alpha = .84-.92$).

Parental over-reactivity was assessed with the Over-reactivity scale from the Parenting Scale (PS; 10 items) (Arnold et al. 1993). Satisfactory reliability and validity have been reported (Arnold et al. 1993). Satisfactory internal consistency (across time points) was observed in this study ($\alpha = .67-.92$).

Parental experiential avoidance was measured with the Parental Acceptance and Action Questionnaire (PAAQ; 15 items) (Cheron et al. 2009). Items from the original version that referred to child's experiences of worry and anxiety were altered to include a broader range of child's negative emotional states as examples (i.e., anger, sadness, restlessness). Moderate internal consistency and reliability have been demonstrated for this scale (Cheron et al. 2009). Satisfactory internal consistency (across time points) was observed for the revised scale in this study ($\alpha = .67-.82$).

Mindful parenting was assessed as the extension of mindful awareness to the interpersonal domain of parent-child relationships with the Interpersonal Mindfulness in Parenting scale (IM-P; 29 items) (Duncan et al. 2009; Dutch translation and validation, de Bruin et al. 2014). Satisfactory validity and reliability have been reported for the questionnaire (de Bruin et al. 2014), and satisfactory internal consistency (across time points) was found for the total score in this study ($\alpha = .83-.90$).

Data Analyses

Prior to main analyses, the distribution of the data and assumptions of testing were assessed. The distributions of all child and parent outcomes showed that sufficient normality, skewness, and kurtosis of all variables were $|2|$, except for scores on mindful parenting (IM-P score). Two outlying values at the lower end of the distribution ($z < -2.5$) were replaced by the lowest non-outlying value. Following this, scores on the IM-P also showed sufficient normality.

The dataset had a hierarchical structure with child and parent outcomes (level 1) repeatedly measured over time (level 2: waitlist, pre-intervention, post-intervention, 8-week follow-up, and 1-year follow-up), nested within each the parent-child dyad. To accommodate the current nested structure, and random and non-random types of missing data in the current dataset, child and parent outcomes were tested using multi-level regression models. Measurement points were the main predictor variable in all models and were dummy coded with pre-intervention scores as the reference in the models. To analyze potential mechanisms that may simultaneously operate and explain the improvement in child outcomes, the potential parenting mechanisms were included as additional predictors in these initial models along with measurement points. The maximum likelihood was the estimation model. Standardized parameter estimates were calculated and interpreted similarly to Cohen's *d* effect sizes (Cohen 1988).

Results

Effects on Child and Parent Psychopathology, Parent Characteristics, and Parenting Factors

Table 2 presents the means and standard deviations of all measures at the four different time points. Table 3 presents the results from the initial multilevel analyses assessing the effects of mindful parenting training across all outcome measures.

Following training, significant improvements across child psychopathology were observed with small effect sizes. More specifically, immediate improvement (pre- to post-intervention) was observed for child internalizing and attention problems, with small effect sizes. Improvements in child internalizing problems were maintained at 8-week follow-up, with an increase in effect size (remaining small), but not at 1 year. Improvements in child attention problems were maintained at 8-week and 1-year follow-up, with similar effect sizes. Delayed improvements (pre-intervention to 8-week follow-up) are observed for child externalizing problems, with a small effect size; however, these effects are not maintained at 1-year follow-up.

A significant immediate improvement was observed for parent externalizing problems, with small effect size, which was maintained at 8-week and 1-year follow-ups, with an increase in effect size (medium). Delayed improvements (pre-intervention to 8-week follow-up) were observed for parent internalizing and attention problems, with small effect sizes; however, these effects were not maintained at 1-year follow-up. Immediate improvements were observed in parents' general mindfulness, with a medium effect size, which was maintained at 8-week follow-up, with an increase effect size (large), but not at 1-year follow-up.

Immediate improvements were observed across all parenting factors (parenting stress, parental over-reactivity, experiential avoidance, and mindful parenting), with small to medium effect sizes (largest effect observed for mindful parenting). All effects were maintained at 8-week follow-up, with increasing effect sizes (largest for mindful parenting). At 1-year follow-up, improvements were maintained for parenting stress, parental over-reactivity, and experiential avoidance in parenting, with small to large effect sizes (largest effect for experiential avoidance in parenting).

Parental Predictors of Change in Child Psychopathology

To investigate whether the improvements in child psychopathology as a result of mindful parenting training were predicted by the increase in mindful parenting rather than increased general mindful awareness, we included parents' scores of mindful parenting (IM-P) and general mindful awareness (FFMQ) in the initial multi-level regression models with child outcomes (reported above).

Neither changes in general mindfulness nor mindful parenting were related to improvements in child internalizing or externalizing problems ($p > .05$). Improvements in child attention were predicted by increases in mindful parenting ($F(1, 210.82) = 9.61, p = .002$), but not general mindful awareness ($p = .274$). The main effect of time is no longer significant (all $p > .05$) after accounting for changes in general mindful awareness and mindful parenting. Thus, it seems that improvements in mindful parenting fully accounted for the effects of Mindful Parenting training on child attention problems.

Improvements in child internalizing were predicted by decreases in experiential avoidance in parenting ($F(1, 212.82) =$

Table 2 Means and standard deviations of all variables across measurement points: pre-test (before 8-week mindful parenting training intervention), post-test (after intervention), follow-up 1 (8 weeks after post-test), and follow-up 2 (1 year later)

Outcome variable	Pre-test			Post-test			Follow-up 1			Follow-up 2		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Child internalizing problems (CBCL)	88	0.55	0.33	70	0.45	0.29	67	0.41	0.28	15	0.36	0.24
Child externalizing problems (CBCL)	88	0.47	0.31	70	0.41	0.31	67	0.38	0.29	15	0.25	0.22
Child attention problems (CBCL)	88	0.88	0.38	70	0.74	0.37	67	0.71	0.41	15	0.53	0.34
Parental internalizing problems (ASR)	89	0.50	0.34	72	0.45	0.29	67	0.40	0.32	15	0.41	0.37
Parental externalizing problems (ASR)	89	0.35	0.21	72	0.30	0.19	68	0.23	0.20	15	0.27	0.23
Parental attention problems (ASR)	89	0.70	0.41	72	0.64	0.34	67	0.56	0.39	15	0.47	0.38
General mindful awareness (FFMQ)	89	3.17	0.57	73	3.59	0.45	67	3.70	0.51	7	3.74	0.86
Parenting stress (PSI)	88	3.12	0.93	73	2.75	0.80	66	2.67	0.85	7	2.03	0.61
Parental over-reactivity (PS)	88	3.69	0.89	72	3.23	0.82	67	3.10	0.86	7	2.30	1.01
Experiential avoidance in parenting (PAAQ)	88	3.66	0.68	72	3.32	0.71	67	3.19	0.75	7	2.80	0.77
Mindful parenting (IM-P)	89	3.21	0.37	75	3.47	0.66	67	3.66	0.37	7	3.88	0.40

Table 3 Standardized parameter estimates, standard errors and *F* values (degrees of freedom) of multilevel models of treatment outcome of the mindful parenting training predicted by measurement points (deviations from pre-test)

Outcome variable	Intercept			Post-test			Follow-up 1			Follow-up 2			
	<i>n</i>	β	<i>SE</i>	<i>F</i>	(<i>df</i>)	β	<i>SE</i>	<i>F</i>	(<i>df</i>)	β	<i>SE</i>	<i>F</i>	(<i>df</i>)
Child internalizing problems (CBCL)	88	.11	.26	6.32*	(1,93.38)	-.37	.10	14.02**	(1, 81.54)	-.45	0.10	20.96**	(1,79.22)
Child externalizing problems (CBCL)	88	-.28	.22	9.57**	(1, 92.07)	-.17	.11	2.49	(1,72.66)	-.26	0.11	4.98**	(1, 78.65)
Child attention problems (CBCL)	88	.02	.23	17.30**	(1,91.59)	-.37	.09	15.18**	(1,77.15)	-.37	0.09	15.87**	(1,71.70)
Parental internalizing problems (ASR)	89	-.06	.27	1.64	(1,92.57)	-.19	.10	3.82†	(1,80.01)	-.33	0.10	10.23*	(1,66.95)
Parental externalizing problems (ASR)	89	.02	.26	3.56†	(1,92.48)	-.26	.09	7.70**	(1,82.77)	-.58	0.10	35.77**	(1,75.25)
Parental attention problems (ASR)	89	.27	.26	2.52	(1,93.25)	-.16	.10	2.55	(1, 80.72)	-.35	0.11	9.43**	(1, 75.29)
General mindful awareness (FFMQ)	89	-.33	.22	24.94**	(1,91.39)	.70	.10	52.33**	(1,84.82)	.91	0.10	81.87**	(1,70.59)
Parenting stress (PSI)	88	.26	.24	12.24**	(1153.29)	-.43	.11	15.90**	(1153.36)	-.48	0.11	17.76**	(1154.95)
Parental over-reactivity (PS)	88	.12	.22	13.32**	(1, 90.20)	-.50	.12	16.42**	(1, 83.71)	-.65	0.14	22.75**	(1, 80.65)
Experiential avoidance in parenting (PAAQ)	89	.48	.24	11.43**	(1,91.76)	-.45	.11	15.38**	(1,75.99)	-.62	0.11	32.87**	(1,65.55)
Mindful parenting (IM-P)	89	-.22	.21	40.75**	(1,90.45)	.77	.11	47.29**	(1, 82.95)	1.04	0.11	82.67**	(1, 70.26)

† $p < .10$; * $p < .05$; ** $p < .01$ β = Standardized parameter estimate; can be interpreted as the effect size of change

17.68, $p < .001$), but not parental over-reactivity ($p = .279$), mindful parenting ($p = .200$) nor parenting stress ($p = .068$). The main effect of time remained significant from pre- to post-intervention ($F(1, 164.74) = 5.36$, $p = .022$); from pre-intervention to 8-week follow-up ($F(1, 171.03) = 5.23$, $p = .023$) and pre-intervention to 1-year follow-up (same as initial model, $p = .278$). Thus, decreased experiential avoidance in parenting only partially accounted for improvements in child internalizing problems following mindful parenting training.

Improvements in child externalizing were predicted by decreases in parental over-reactivity ($F(1, 216.39) = 5.51$, $p = .020$), but not by experiential avoidance in parenting ($p = .155$), mindful parenting ($p = .413$), nor parenting stress ($p = .078$). The main effect of time was no longer significant ($p \geq .291$); thus, decreases in parental over-reactivity fully accounted for improvements in child externalizing problems following mindful parenting training.

Improvements in child attention problems were predicted by decreases in experiential avoidance in parenting ($F(1, 218.75) = 6.06$, $p = .015$) and increases in mindful parenting ($F(1, 218.75) = 6.06$, $p = .015$). Neither parenting stress ($p = .123$) nor parental over-reactivity ($p = .525$) predicted improvements in child attention problems. The main effect of time was no longer significant ($ps \geq .264$); thus, changes in experiential avoidance in parenting and mindful parenting fully accounted for improvements in child attention problems following the mindful parenting training.

Discussion

The current study aimed to extend previous research on mindful parenting interventions, by testing the proposed mechanisms of improved parenting factors, namely mindful parenting and experiential avoidance in parenting, parenting stress, and over-reactivity. First, intervention effects from previous literature were replicated here; improvements were observed across parent-reported child and parent psychopathology, across timepoints following the mindful parenting intervention. Second, improvements were observed in the parenting factors targeted within the mindful parenting intervention, decreased parenting stress, decreased parental over-reactivity, decreased experiential avoidance in parenting, increased mindful parenting. Third, the hypothesized specificity of the mechanisms of the mindful parenting training was indicated by different parenting predictors of improvements in child internalizing, externalizing, and attention problems.

Consistent with previous research, and the hypothesized effects, the findings observed here confirm the positive effects of the mindful parenting training program (Bögels and Restifo 2014) for children and their parents (Bögels et al. 2014; Meppelink et al. 2016). Immediate improvements in child

internalizing and attention problems were observed; both effects were maintained at 8-week follow-up, with improvements in child attention also maintained at 1-year follow-up. In partial support of previous studies, delayed improvements in child externalizing (pre-intervention to 8-week follow-up) were observed, which were not maintained at 1 year. Overall, improvements were observed across the three areas of child psychopathology, with the strongest evidence emerging for the sustained effects on child attention problems. Main effects of the mindful parenting training were observed in relation to parent characteristics, with immediate and sustained (8 weeks and 1 year) improvements in parent externalizing problems with small to medium effects. Improvements were observed for parent internalizing and attention problems at initial follow-up, but these were not maintained at 1 year. In this study, the strongest evidence for the effects of the mindful parenting intervention on parent psychopathology emerged for externalizing problems. These findings are partially consistent with previous studies (Bögels et al. 2014; Meppelink et al. 2016). Consistent with previous mindfulness-based intervention studies, the results confirmed an immediate improvement in parents' general mindful awareness, which was maintained at initial follow-up; however, these effects were lost at 1 year.

The most consistent and sustained effects of the mindful parenting training were observed in relation to parenting factors, demonstrating the successful specificity of the intervention in relation to targeted processes. A decrease in parenting stress, decrease in negative parenting practices, and increase in mindful parenting were observed, replicating previous research (Bögels et al. 2014; Meppelink et al. 2016; Potharst et al. 2017). The observed immediate and sustained improvement in experiential avoidance in parenting extends previous research. This new finding demonstrates that the mindful parenting training not only functions to increase parents' awareness of parenting situations, but also enables them to adopt a more accepting attitude toward negative experiences in the context of parenting (i.e., no longer be fearful of or avoid negative thoughts and emotions relating to parenting).

The current findings extend previous research on mindful parenting interventions by indicating the mechanisms of change within parenting factors. Increased mindful parenting accounted for the observed improvements in child attention problems, whereas increased general mindful awareness in parents did not. However, this effect was not observed for child internalizing and externalizing problems, thus providing partial support for the study hypotheses and previous research (Meppelink et al. 2016). Improvements in child internalizing problems were predicted by decreased experiential avoidance in parenting. Improvements in child attention problems were predicted by a combination of decreased experiential avoidance and increased mindful parenting. For internalizing and attention problems, these findings indicate that the key parenting mechanisms of the mindful parenting training may lie

within the parent's quality of nonjudgmental attention to the parent-child relationship, specifically to the child's, as well as the parents' emotional reactivity.

Decreased experiential avoidance in parenting relates to the parents' ability to accept negative thoughts, emotions, and impulses in relation to challenging parenting situations, which may be in regard to their child's reactions or their own reactions. This attitude of acceptance may enable parents to support a child in undergoing something difficult, and allow the child to find it difficult, rather than avoiding such a situation or forcing the child without giving emotional support. In combination with decreased experiential avoidance in parenting, increased mindful parenting allows the parent to have a greater awareness of present-moment parenting experiences, including their child's behavior and emotions, and the regulation of their own reactions to their child. In regulating their own emotional or behavioral reaction to their child, parents may also improve their co-regulatory abilities, which support the child in developing self-regulation. Furthermore, the most consistent effect for parents was observed in regard to improved externalizing problems. Although the causal chain cannot be inferred directly from the current findings, taken together, these findings may suggest that increased attentional, emotional, and behavioral self-regulation enabled parents to show less externalizing behavior and engage in more positive parenting practices. Thus, parents modeled to their child this increased ability to self-regulate their automatic reactions in the parenting context, and to respond rather than react to challenge (Gouveia et al. 2016). In so doing, the child may have learned a means for increasing their own awareness, manifesting as a reduction in attention problems. This interpretation is consistent with the proposed benefits of mindful parenting in targeting parental distress (Bögels et al. 2014), improving positive parenting (Duncan et al. 2009), which in turn leads to improved child outcomes (Brassell et al. 2016; Parent et al. 2016). Furthermore, previous research has illustrated the benefits of mindful parenting as part of psychological intervention for children with attention deficit hyperactivity disorder (Van de Weijer-Bergsma et al. 2012; Van der Oord et al. 2012).

Experiential avoidance in parenting and mindful parenting did not account for improvements in child externalizing problems; as hypothesized, decreased parental over-reactivity emerged as a significant predictor here. This finding suggests that a reduction in parental over-reactivity was related to (parent's observation of) an improvement in their child's behavioral problems. The link between parental over-reactivity and child externalizing specifically has been previously established (Miller-Lewis et al. 2006). Over-reactivity is supposed to be driven by negative emotional reactions in parenting, such as anger and frustration (Van den Akker et al. 2010). During the mindful parenting training, parents practiced being responsive and not reactive toward their child, thus facilitating increased regulation of their emotional reactions, which

promotes reduced over-reactivity. In making this particular change in their parenting practice, parents may model appropriate emotion and behavior regulation to their child, thus accounting for improvements in child externalizing problems.

Limitations and Future Research

The parenting factors assessed within this study have overlapping characteristics, as highlighted for experiential avoidance and mindful parenting. The behavioral manifestation of decreased experiential avoidance and increased mindful parenting would be decreased parental over-reactivity. These overlapping features would account for a proportion of common variance in the analyses. However, there was sufficient distinction between the variables to warrant their combined analysis. In addition, given the conceptual overlap, those parenting factors that were related to improvements in different child problems indicate a potential unique relationship.

An alternative view may take account of the reliance on parent self-report in the current studies, such that it is the parents' perception of their child's problems that is assessed and improves. With an increased quality of awareness in the parenting context, parents were perhaps more accepting of their child's difficulties and perceived them to be less of a problem or challenge. In future studies, third party reports (e.g., teacher) of child behavior should be taken in order to determine whether the effect is unique to parents' perception. A key limitation of the current study is the lack of a control comparator, as well as the low number of observations at follow-up. Future studies should include randomized controlled trials of mindful parenting, including trials that assess the potential enhancing effects that mindful parenting training could have for outcomes from behavioral parenting training. The findings in relation to child attention problems also indicate a potential specificity for the mindful parenting training. Established parenting programs for children with attention problems have limited efficacy, particularly when parents also have their own mental health issues (Johnson et al. 2008; Modesto-Lowe et al. 2008; Thomas and Zimmer-Gembeck 2007; Tung et al. 2017). Mindful parenting offers a potential means of addressing parents' own difficulties, their parenting practices, and their child's attention problem. Future research should explore the possibility of mindful parenting training being an adjunct to established parenting programs and assess any improvements in effects.

Authors' Contributions LME wrote the paper. EA conducted data analyses and collaborated with the writing of the paper. EdB collaborated in the writing of the paper. EP conducted data analysis and collaborated in writing the paper. SB designed the study and collaborated in the writing and editing of the manuscript. All authors approved the final version of the manuscript for submission.

Compliance with Ethical Standards

Conflict of Interest SB is shareholder of a treatment center that offers Mindful Parenting training. All other authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the Ethical Committee of the University of Amsterdam, the Medical Ethical Commission of the Academic Medical Center of the University of Amsterdam and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the studies.

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