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THE APPLICATION OF THE THIRD GENERATION OF COGNITIVE-BEHAVIORAL APPROACHES TO PARENTING

EDITED BY: Helena Moreira, Eva S. Potharst and Maria Cristina Canavarro
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THE APPLICATION OF THE THIRD GENERATION OF COGNITIVE-BEHAVIORAL APPROACHES TO PARENTING

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Image from Research Group "Relationships, Development and Health" from the Center for Research in Neuropsychology and Cognitive-Behavioral Intervention from the University of Coimbra

In recent years, there has been growing interest in understanding how the third generation of cognitive-behavioral approaches, particularly mindfulness-, compassion-, and acceptance-based approaches, can contribute to the design of more efficacious parenting interventions and to a better understanding of parenting behaviors and the parent-child relationship. However, the application of third-generation cognitive-behavioral therapies and concepts to parenting is still in its infancy, and further research is needed to explore the potential of these approaches to enhance existing parenting interventions or to inform the development of new parenting interventions targeting different groups of parents and their children. More research is also needed to understand how mindfulness, (self-)compassion, acceptance and other related psychological processes may influence parenting practices, the parent-child relationship, and the child's socioemotional development. With this e-book, presenting state-of-the-art research articles on third generation cognitive-behavioral approaches, a new step is taken in 1) exploring relations between

parenting-related issues and concepts from the third generation cognitive-behavioral framework, and 2) examining parenting-interventions informed by third-generation cognitive-behavioral therapies.

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Editorial: Application of the Third Generation of Cognitive-Behavioral Approaches to Parenting

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Keywords: parenting, third generation of cognitive-behavioral therapy, mindfulness, compassion, acceptance

Editorial on the Research Topic

Application of the Third Generation of Cognitive-Behavioral Approaches to Parenting

In recent years, there has been growing interest in understanding how the third generation of cognitive-behavioral approaches, particularly mindfulness- and acceptance-based approaches, can contribute to the design of more efficacious parenting interventions (Bögels et al., 2014; Coatsworth et al., 2014; Kirby, 2016; Whittingham and Coyne, 2019) and to a better understanding of parenting behaviors and the parent-child relationship (Brassell et al., 2016; Parent et al., 2016). For instance, it has been proposed that bringing mindful attention to parent-child interactions may improve the quality of parenting (Gouveia et al., 2016; Potharst et al., 2018), foster a more positive parent-child relationship (Medeiros et al., 2016; Chaplin et al., 2018), and promote better psychological functioning in children and their parents (Meppelink et al., 2016; Parent et al., 2016; Turpyn and Chaplin, 2016). Other psychological processes, such as (self-)compassion and acceptance, have also shown to play an important role in the way parents think and feel about parenting and in the way they interact with and relate to their children (Moreira et al., 2015; Brassell et al., 2016; Kirby, 2016; Whittingham et al., 2019).

However, the application of third-generation cognitive-behavioral therapies and concepts to parenting is still in its infancy, and further research is needed to explore the potential of these approaches to enhance existing parenting interventions or to inform the development of new parenting interventions targeting different groups of parents and their children. More research is also needed to understand how mindfulness, (self-)compassion, acceptance, and other related psychological processes may influence parenting practices, the parent-child relationship, and the child's socioemotional development.

In the current Research Topic, we brought together several researchers from different countries (Australia, Brazil, China, United States, Italy, Germany, Portugal, The Netherlands, and UK) that focused on the application of third-generation cognitive-behavioral therapies and models to parenting. Of the 14 articles published on this topic, five focused on exploring variables (e.g., experiential avoidance, compassion) that may influence parental behavior and their child's psychological functioning. The remaining studies focused on empirically-based parenting interventions informed by third-generation cognitive-behavioral therapies. These interventions were delivered in different formats (e.g., group and online) and were designed for different phases of the life cycle (e.g., transition to parenthood) and for different target groups (e.g., mothers of children with some developmental condition).

Two studies explored how parent factors, such as goal motivation, psychopathology, and work-family conflict, can influence parenting styles and behaviors. Kirby et al. showed

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that mothers' compassionate goals contributed to facilitative parenting, whereas self-focused goals were associated with greater psychologically controlling parenting. Moreira et al. found that mothers who experienced increased levels of work-family conflict were less mindful in their relationship with their children because they experienced higher levels of parenting stress and anxiety and depressive symptoms.

Two studies investigated the role of a mindful parenting style on the child's socioemotional functioning. Gouveia et al. found that higher levels of mindful parenting skills were associated with lower levels of emotional eating in adolescents. These authors also found that this association was mediated by the adolescents' self-compassion and body shame. In a study focusing on the association between mindful parenting and preschool children's decision-making behavior, Wong et al. found that higher levels of maternal mindful parenting predicted child prosocial decision-making behavior during a sharing task.

In another study focusing on the effect of parenting behaviors on child functioning, Emerson et al. examined the intergenerational relationship between parent and child anxiety and highlighted the key role of parental experiential avoidance. These authors found that parental control and parental experiential avoidance mediated the association between parent and child anxiety, and they also found that the association between parental control and child anxiety was only significant under conditions of high parental experiential avoidance.

The remaining studies focused on parenting interventions and included empirical studies testing the effects of those interventions, a systematic review and meta-analysis, a conceptual study, a study protocol, and an opinion article. Parent training programs that are either mindfulness-based or include mindfulness meditation are adjusted for specific populations of parents. Zeegers et al. focused on mothers with an infant- or toddler-aged child who experienced parenting stress and/or (co)regulatory difficulties. They showed that the mindful parenting group training, Mindful with your Baby/Toddler, was effective in improving parental stress, observed parental acceptance of the child and attunement to the child's mental world. Zhang et al. carried out an RCT in military families post-deployment, offering the mothers either services as usual or a parent training program that included mindfulness meditation in each of the 14 sessions (After Deployment Adaptive Parenting Tools program). They found that mothers with low trait mindfulness at baseline showed improved trait mindfulness at 1-year follow-up, and this mediated improvements in self-reported parenting skills at 2-year follow-up. Singh et al. offered a parent training program that included both mindfulness and positive behavior support (the Mindfulness-Based Positive Support Program) to parents of adolescents with either autism spectrum disorder or intellectual disabilities. In both of these groups, not only was a reduction of parental stress shown but also a reduction in adolescent aggression and an improvement in adolescent compliance behavior.

Psychological interventions, including mindfulness-based and other third generation cognitive-behavioral interventions, are

increasingly offered via the internet (Spijkerman et al., 2016). Two studies in this Research Topic examined the effectiveness of online, self-directed interventions. Fonseca et al. offered a cognitive-behavioral intervention including elements of self-compassion and acceptance (Be a Mom) to women in the postpartum period who were at risk for postpartum depression. In an RCT, Be a Mom was compared with a waiting list and was shown to be effective in reducing symptoms of depression and emotion regulation difficulties and increasing self-compassion. Potharst et al. carried out an RCT in women with a toddler who were experiencing elevated levels of parental stress to whom they offered an online mindful parenting training. In comparison to the waiting list, the training was effective in improving self-compassion and in decreasing symptoms of anxiety and depression and parental over reactivity.

In a systematic review and meta-analysis, Burgdorf et al. assessed the effectiveness of mindfulness interventions for parents in reducing parenting stress and improving youth psychological outcomes. These authors concluded that mindfulness-based parenting interventions may reduce parenting stress and improve youth psychological functioning.

In three manuscripts on this Research Topic, new applications of cognitive-behavioral interventions for parents are presented. Cousineau et al. elaborate on the possibility and importance of offering training not only in mindfulness but also in compassion to parents with children with chronic disease or disability to alleviate parental burden and support child well-being; they introduce their Model of Compassion, Mindfulness, and Resilience in Parental Caregiving, on the basis of which a new intervention can be developed. In their manuscript presenting a research protocol, Lo et al. introduce the idea of enriching psychoeducation to families with an adult-aged child with psychosis with mindfulness. Because of the high levels of stress that these parents experience and the importance of family functioning in the prevention of relapse, family psychoeducation is included in treatment guidelines. In an RCT, they will study the added value of mindfulness for both the parents and young adults by comparing Mindfulness-Based Family Psychoeducation with regular family psychoeducation. The starting point for the manuscript by Grecucci et al. is the importance of internalized dysfunctional attachment, which, in parents, can take the form of mental representations of the child and the self as a parent. These lead to maladaptive coping strategies that negatively influence parenting and the parent-child relationship. The authors offer a two-step approach, in which mindfulness and acceptance techniques may be important and valuable additions to Schema Therapy in treating these mental representations because they may be supportive in containing the emotional experience associated with the mental representations, decreasing the acting out of the maladaptive coping strategies, and choosing new behavior that is values-based.

The manuscripts in this Research Topic have illustrated the importance of mindfulness and related psychological processes in parenting, the parent-child relationship and child development. The manuscripts showed the possibilities of third generation

cognitive-behavioral approaches for a wide range of difficulties that families may encounter. The wide variety of application areas that were described in this Research Topic may, on the one hand, support and motivate researchers and clinicians to continue to adjust existing programs for specific target groups, but on the other hand, to return to the essence of these approaches, namely, to recognize common humanity and universal suffering in specific difficulties and the need for mindful acceptance and compassion.

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The Role of Compassionate and Self-Image Goals in Predicting Psychological Controlling and Facilitative Parenting Styles

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People enter into parental roles with a range of different motivations for parenting. To date, however, there is limited research assessing maternal motivations, concerns, and anxieties in their parenting styles. While some mothers are confident and child focused, others have concerns with performing parenting behaviors, and can be self-focused, shame prone, and self-judgmental. Two studies explored these two dimensions in relation to degree of controlling and facilitative parenting styles in the mothers of 3–9-year-old children. In study one, 151 mothers took part in an online survey measuring these two dimensions using the compassionate goals and self-image goals scales (Crocker and Canevello, 2008), in relation to facilitative and controlling parenting styles. As predicted, after controlling for child behavior, parental mental health, and parental self-efficacy, self-focused and shame avoidant concerns were associated with greater psychologically controlling parenting. In contrast a compassionate focused orientation was associated with greater facilitative parenting. In study two, 198 mothers were randomly assigned to either compassion focused goals, self-image goals, or control condition, which was manipulated by varying the instructions provided to participants. Emotional responses (e.g., angry, sad, and shame) to difficult parenting scenarios did not differ depending on whether participants were prompted with compassionate goal, self-image goal, or control condition instructions. The findings from study 1 demonstrate how goal motivation can influence parenting style, with the results from study 2 suggesting that instruction alone is insufficient to shift goal orientation.

Keywords: compassion, compassionate goals, parenting, motivation, compassion focused therapy

INTRODUCTION

Parenting style is linked to a range of maturational processes in the child including: on epigenetics (Cowan et al., 2016), brain development (Belsky and de Haan, 2011), attachment (Mikulincer and Shaver, 2016), emotional responding (Eisenberg et al., 1991), self-control (Cecil et al., 2012), and social and communicative competence (Hart et al., 2003). A number of factors influence parenting including, the ecological and social environment (e.g., poverty) (Perkins et al., 2013); stress (Anthony et al., 2005); mental health (Rodgers, 1998); parental knowledge and competency (Sanders and Mazzucchelli, 2018); self-efficacy (Sanders and Woolley, 2005), and the nature,

disruptiveness and severity of child behavior problems (Jackson, 2000). Over the last 30 years various parenting programs have been developed to target parental factors of skills and competency to improve outcomes for children (Sanders and Kirby, 2014; Kirby, 2016).

A number of authors have also highlighted the importance of assessing parental motives and concerns as sources of variation in parenting (Abidin, 1992; Sanders and Mazzucchelli, 2018; Kirby et al., 2019). Indeed there are a number of different motives underpinning maternal parental styles including: authoritarian versus authoritative (Robinson et al., 1995); facilitative, which is work around and with the child's needs, in contrast to regulating, which seeks to enable the child to fit into routines and structures of the family and parent (Raphael-Leff, 1986). Koren-Karie et al. (2002) explored three types of maternal interaction: (1) *positively insightful mothers* who tried to orientate their behaviors by trying to see the world through the child eyes; in contrast (2) *one-sided mothers* who had clear ideas about what the child needed and how the child should act, they tended to impose care; and (3) *disengaged mothers* who struggled to relate to their children. One crucial dimension to parental motives and concern is the degree to which parents feel confident in their parental role in contrast to uncertain, self judgmental, shame prone, and shame avoidant.

Compassionate and Self-Image Goals

Crocker and her colleagues (Crocker and Canevello, 2008; Crocker et al., 2009) developed a measure to tap into these dimensions of social relating: labeled compassionate goals (i.e., desires to be helpful) and self-image goals (i.e., concerns with doing things wrong and being rejected). Crocker et al. (2009) theorized that people with self-image goals typically view relationships with others from an *egcosystem* motivational perspective by prioritizing their own anxieties and needs at the expense of others. People adopt self-image goals to construct, maintain and defend a public image that reflects their ideal self (Crocker and Canevello, 2008; Crocker et al., 2009). Self-image goals are self-focused, defensive and typically adopted by those lacking in social confidence as a safety behavior to avoid rejection, which paradoxically leads to decreased regard from others, and decreased self-esteem, and less secure relating (Canevello and Crocker, 2011). Self-image goals tend to be associated with high emotional arousal such as shame, anger, and sadness (Crocker and Canevello, 2011).

In contrast, compassionate goals are other-focused and operate from an *ecosystem* motivational perspective (Crocker et al., 2009). When operating with compassionate goals, people want to be helpful to, and avoid harming, others (Crocker and Canevello, 2008). Compassionate goals are associated with increased self-esteem and regard from others (Canevello and Crocker, 2011), and foster positive emotions such as feeling at ease and connected to others (Canevello and Crocker, 2017).

There is accumulating evidence showing that compassionate and self-image goals reflect distinct motivational perspectives (Crocker and Canevello, 2008; Canevello and Crocker, 2011; Erickson et al., 2018). Crocker and Canevello (2008) examine intrapersonal effects of goals on perceived social support and trust in 199 students. Those with high levels of compassionate

goals and low self-image goals reported greater perceived social support and trust, and reduced conflict. Conversely, self-image goals were associated social anxiety, defensive beliefs, and increased conflict and loneliness. Compassionate and self-image goals have not been specifically examined in parents but these motives may play a role in tendencies to be controlling.

Controlling vs. Facilitative Parenting Styles

Parenting that is highly controlling is linked to poor child outcomes such as anxiety (Laurin et al., 2015) and lower social competence (McDowell et al., 2003). Conversely, positive and facilitative parenting practices are linked to positive child outcomes, including increased social competence (McDowell et al., 2003) and reduced likelihood that a child will develop antisocial behaviors, despite the influence of neighborhood deprivation, poverty and low socio-economic status (Odgers et al., 2012).

Controlling parenting is a highly intrusive form of parenting, whereby the parent attempts to control the child's thoughts, self-expression, feelings, and attachment to the parent (Barber, 1996; Barber and Harmon, 2002). Psychological control strategies include inducing guilt and anxiety, and withdrawing love, in order to control the child (Barber and Harmon, 2002). Mills et al. (2007) examined the link between shame and psychological control among 198 mother-father pairs of children aged 3.6 to 4.5 years. A negative approach to the child mediated the association between shame and critical/rejecting parenting. The authors suggested that shame prone parents may project shame onto their child, leading to negative feelings that increase critical/rejecting behavior. Proneness to shame, characterized by self-focused concerns, may be an important factor that leads to psychological control (Mills et al., 2007). Given this, self-image goal orientation, which are significantly correlated with shame (Crocker and Canevello, 2011) and concern with others' judgments of self (Canevello and Crocker, 2011), may also be significantly associated with controlling parenting.

In contrast, facilitative parenting promotes independence, rather than being overly directed or protected (Healy et al., 2015b). Facilitative parenting encompasses warm and responsive parenting behaviors that support the child's social skills and peer relationships (Healy et al., 2015b). It involves coaching social and emotion regulation skills, managing parent-child conflict and encouraging socialization with peers (Healy et al., 2015a). Facilitative parenting has been linked to positive social, emotional, and behavioral outcomes (Healy et al., 2015a). Miller et al. (2015) explored the relationship between compassion, autonomic nervous system activity, and parenting behaviors among 83 mothers during challenging interactions with their child. Mothers and their 3.5-year-old child were provided with two tasks. During the difficult puzzle task, mothers could give as much assistance to the child as required. During an origami task, mothers were instructed to provide verbal instruction only. Miller et al. (2015) found that greater self-reported compassion for one's child was associated with greater observed warmth, reduced observed negativity, and reduced harsh parenting.

Miller et al. (2015) utilized observational and physiological measures, supporting the conclusion that a compassion orientation protected against adverse parenting practices, even among those who experienced strong physiological stress. To date, however, there has been no direct exploration of compassionate and self-image goals in relation to controlling and facilitative parenting. Examining these links could provide insights into how motives influence parenting style, and thus offer a modifiable target (e.g., parent motivation) in parenting programs to help improve parent-child relating and positive childhood social, emotional and behavior development.

The Current Research

Self-image and compassionate goals shape relationships with others (Crocker and Canevello, 2008; Canevello and Crocker, 2011; Erickson et al., 2018).

The aim of the first study was to examine the relationship between (a) compassionate goals, and (b) self-image goals, and facilitative and psychologically controlling parenting styles.

Study 2 sought to extend on previous research by examining the impact of priming mothers with different goal orientations, and exploring their emotional responses to difficult mother-child interactions.

STUDY 1

The first study involved a cross-sectional survey design to examine whether compassionate and self-image goals in parents explain variance in their implementation of facilitative and psychologically controlling parenting behaviors. Participants completed an online questionnaire about their child's behavior, parental mental health, self-efficacy, interpersonal goals, and parenting. Child behavior, parental mental health, and self-efficacy were included as they are known to influence parenting behavior (Mash and Johnston, 1990; Abidin, 1992; Rodgers, 1998; Jackson, 2000; Anthony et al., 2005; Sanders and Woolley, 2005). To measure compassionate and self-image goals in parents, the Compassionate and Self-Image Goals Scale, developed by Crocker and Canevello (2008), Study 2, was adapted to apply to a parenting context.

Based on the theory that self-image goals involve prioritizing one's own needs at the expense of others (Crocker et al., 2009), it was hypothesized that self-image goals would positively predict psychologically controlling parenting, over and above variance explained by child behavior, parental mental health, and parental self-efficacy (H1). In contrast, given that compassionate goals are associated with responsiveness to other's needs (Canevello and Crocker, 2011) and belief in interconnectedness with others (Crocker and Canevello, 2008), it was hypothesized that compassionate goals would positively predict facilitative parenting, over and above variance explained by child behavior, parental mental health, and parental self-efficacy (H2). We also explored whether self-image goals would explain variance in facilitative parenting, and whether compassionate goals would explain variance in psychological control, over and above child behavior, parental mental health, and self-efficacy.

MATERIALS AND METHODS

Both Study 1 and 2 were granted ethical approval by the University of Queensland ethics review committee in accordance with the National Health and Medical Research Council's guidelines (clearance number: 18-PSYCH-4-71-JMC). Both studies were preregistered with the Open Science Framework¹.

Design and Participants

The study was a cross-sectional survey design. Predictor variables were child behavior, parental mental health, self-efficacy, and compassionate and self-image goals. Based on past research, the parent's age and the age of their child were included as control variables (Sanders et al., 2014). Outcome variables were psychological control and facilitative parenting. An a priori power analysis using the software program G*Power (Faul et al., 2007) indicated that 103 participants would be required to obtain adequate power (0.80) to detect a medium *r* effect of 0.15 at the standard 0.05 alpha error probability.

Two-hundred and nineteen respondents voluntarily accessed the survey. Parents with a child aged 3–9 years were eligible to participate. Forty-four participants were excluded (child not aged 3–9 years, *n* = 8; missing all data, *n* = 28; only provided demographic information, *n* = 8). There were 11 males (6.29%) and 164 females (93.71%). The majority of participants in previous parenting research have been mothers (Nowak and Heinrichs, 2008) and there was a small proportion of males in the current study, thus, the decision was made to remove males from further analyses. A further 13 participants were excluded due to inadequate sampling. Inadequate sampling refers to the participants that were excluded due to missing a large proportion of data. Thirteen participants were missing over 77.50% of the data points and were therefore deemed inadequately sampled. The final sample consisted of *N* = 151 mothers aged 19–55 years (*M* = 35.24 years, *SD* = 6.14), with at least one child aged 3–9 years (*M* = 5.45 years, *SD* = 1.94). Additional participant demographic information is provided in **Table 1**.

Measurements

Demographic Information

The Family Background Questionnaire (FBQ; Zubrick et al., 1995) was used to collect demographic information, as reported in **Table 1**.

Child Behavior

The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) consists of 25 items measuring parents' perceptions of their child's prosocial and difficult behaviors. There are five subscales each containing five items, measuring emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems, and prosocial behavior. Participants responded on a three-point Likert scale from 0 (*Not True*) to 2 (*Certainly True*). The Total Difficulties score is calculated by summing the scores from all of the scales except the Prosocial Behavior scale, with higher scores indicating more problematic child behavior.

¹<https://osf.io/8vc73/> and <https://osf.io/p268g/>

TABLE 1 | Study 1: participant demographic characteristics ($N = 151$).

Characteristics	<i>N</i>	%
Education		
Some high school	8	5.30
Completed high school	13	8.60
Tertiary or tafe course	73	48.30
Postgraduate degree	57	37.70
Employment status		
Full-time	37	24.50
Part-time	55	36.40
Casual	14	9.30
Employed, but on maternity leave	11	7.30
Full-time student	6	4.00
Unemployed, looking for work	3	2.00
Not in paid employment	25	16.60
Income ($n = 148$)		
0 – 10,000	23	15.20
\$10,001 – 20,000	7	4.60
\$20,001 – 30,000	14	9.30
\$30,001 – 40,000	22	14.60
\$40,001 – 50,000	14	9.30
\$50,001 – 60,000	24	15.90
\$60,001 – 70,000	9	6.00
\$70,001 – 80,000	7	4.60
\$80,001 – 90,000	7	4.60
\$90,001 – 100,000	5	3.30
\$100,001+	16	10.60
Ethnicity ($n = 150$)		
Caucasian Australian	131	86.80
Pacific Islander	1	0.70
Asian	4	2.60
Aboriginal/Torres Strait Islander	1	0.70
Other	13	8.60
Relationship status		
Single	11	7.30
Married/defacto	132	87.40
Separated/Divorced	8	5.30
Household dynamic		
Original family (both biological or adoptive parents present)	121	80.10
Step-family (two parents, one being a step-parent)	7	4.60
Sole parent family	16	10.60
Other	7	4.60
Number of children		
One	25	16.60
Two	85	56.30
Three	29	19.20
Four	8	5.30
Five	4	2.60
Social, emotional, behavioral concerns with child		
Yes	63	41.70
No	88	58.30

$N = 151$ (unless otherwise specified).

We only examined Total Difficulties for the present study. The Total Difficulties score has previously shown good concurrent validity (Goodman, 1997). In the current study, the total score showed good internal consistency ($\alpha = 0.84$).

Parental Mental Health

The Depression and Anxiety Stress Scale-21 (DASS-21; Lovibond and Lovibond, 1995) consists of three subscales measuring depression, anxiety, and stress. Participants indicated how much each item applied to them over the past week on a four-point Likert scale from 0 (*Did not apply to me at all*) to 3 (*Applied to me very much or most of the time*). A total score is calculated as a measure of parental mental health by summing all items. Higher scores indicate greater severity of symptoms. Based on a recent analysis of the psychometric properties of the DASS-21, we discarded item 5 when calculating the total score, and converted scored from ordinal level to interval level (Medvedev et al., 2019). The DASS-21 has previously demonstrated good convergent and discriminant validity (Henry and Crawford, 2005) and good internal consistency for the depression ($\alpha = 0.94$), anxiety ($\alpha = 0.87$), and stress ($\alpha = 0.91$) subscales (Antony et al., 1998). In the current study, the total score showed excellent internal consistency ($\alpha = 0.92$).

Parental Self-Efficacy

The parenting sense of competence scale (PSOC; Johnston and Mash, 1989) consists of 16 items that measure two dimensions of parental self-esteem, specifically, satisfaction and efficacy. Participants respond on a six-point Likert scale from 1 (*Strongly Agree*) to 6 (*Strongly Disagree*). For this study, a total score was calculated for the efficacy subscale. Scores are summed, with higher scores indicating higher parental self-efficacy. The PSOC has previously demonstrated convergent and divergent validity (Ohan et al., 2000) and acceptable internal consistency for the efficacy subscale ($\alpha = 0.76$; Johnston and Mash, 1989). In the current study, internal consistency for the efficacy subscale was good ($\alpha = 0.81$).

Compassionate and Self-Image Goals

The Compassionate and Self-Image Goals Scale (Crocker and Canevello, 2008, Study 2) consists of 16 items measuring interpersonal goals. The scale was adapted to apply to a parent-child context for the purpose of this study. The measure began with the phrase “*In the past week, in my relationship with my child(ren), I wanted/tried to...*” followed by seven items measuring self-image goals (e.g., “*Avoid showing my weaknesses*”) and nine items measuring compassionate goals (e.g., “*Avoid being selfish or self-centered*”). Participants responded on a five-point Likert scale from 1 (*Not at all*) to 5 (*Extremely*). The mean for each of the compassionate and self-image subscales was calculated, with higher scores indicating higher interpersonal goals. The original subscales targeted at roommate relationships have demonstrated acceptable to excellent internal consistency ($M_\alpha = 0.95$; self-image goals: $M_\alpha = 0.83$; Crocker and Canevello, 2008, Study 2). In the current study, internal consistency for each subscale was good ($\alpha = 0.84$ for compassionate goals, 0.80 for self-image goals).

Psychological Control

The parental psychological control measure (PPC; Olsen et al., 2002) consists of 33 items that measures psychological control in terms of critical/rejecting parenting. There are six

subscales, specifically, three items measuring constraining verbal expression, three items measuring invalidating feelings, three items measuring personal attacking, six items measuring erratic emotional behavior, five items measuring love withdrawal, and 13 items measuring guilt induction. Participants responded on a 5-point Likert scale from 1 (*Never*) to 5 (*Always*). For this study, a total score was calculated by summing responses, with higher scores indicating higher psychological control. In the current study, internal consistency for the PPC was excellent ($\alpha = 0.90$).

Facilitative Parenting

The Facilitative Parenting Scale (FPS; Healy et al., 2015a) consists of 58 items measuring parental support for child friendships and peer skills. There are 11 subscales, specifically, Warmth, Supports Friendships, Not Over-Protective, Not Conflicting, Child Communicates to Parent, Parent Coaches, Communicates with Teacher, Not Over-Involved in School, Not Aggressively Defensive, Enables Independence, and Not Overly Directive. Participants responded on a five-point Likert scale from 1 (*Not true*) to 5 (*Extremely true*). There are 19 reverse-scored items. The mean score across all items was calculated, with higher scores indicating higher facilitative parenting. The scale has previously demonstrated good internal consistency ($\alpha = 0.89$) and convergent validity (Healy et al., 2015a). In the current study, internal consistency was good ($\alpha = 0.86$).

Procedure

Participants completed the anonymous online questionnaire using Qualtrics™ Survey Software. All the participants provided written online informed consent before the start of their participation. A convenience sample was used involving snowball sampling via online social media.

Data Analysis Plan

Analyses for Study 1 and 2 were performed using IBM SPSS™ software Version 25. Prior to conducting analyses, missing data, assumptions and descriptive statistics were examined. Bivariate correlations between variables were also assessed. Threshold for statistical significance for this study was $\alpha = 0.05$, two-tailed.

A hierarchical multiple regression was conducted to test whether self-image goals explained variance in psychological control, over and above child behavior, parental mental health, and self-efficacy. A second hierarchical multiple regression was conducted to test whether compassionate goals explained variance in facilitative parenting, over and above child behavior, parental mental health, and self-efficacy. For both regression analyses, age of the mother and child in years were entered at Step One to control for demographics (Sanders et al., 2014). Child behavior (SDQ) was entered at Step Two and parental mental health (DASS-21) and self-efficacy (PSOC-Efficacy subscale) were entered at Step Three on a theoretical basis (Mash and Johnston, 1990; Abidin, 1992; Rodgers, 1998; Jackson, 2000; Anthony et al., 2005; Sanders and Woolley, 2005). Compassionate and self-image goals were entered simultaneously at Step Four to assess their unique effect while controlling for the other goal (Crocker and Canevello, 2008).

RESULTS

Data Screening Missing Data

Analyses were conducted to determine the pattern of missing data among key variables (SDQ, DASS-21, PSOC-Efficacy subscale, compassionate and self-image goals subscales, PPC, and the FPS). Missing Values Analysis revealed a non-significant little's missing completely at random (MCAR) test χ^2 (865, $N = 151$) = 824.23, $p = 0.836$, indicating that the data were MCAR. Expectation Maximization was used to estimate missing data at the item level.

Preliminary Analyses Descriptive Statistics

Descriptive statistics were calculated to obtain the means and standard deviations of the measures used in the study (see Table 2).

Bivariate Relationships

As hypothesized, there was significant negative correlation between compassionate goals and psychological control ($r = -0.41$, $p < 0.01$), and a small-moderate positive correlation between compassionate goals and facilitative parenting ($r = 0.32$, $p < 0.01$). In relation to self-image goals, there was a small-moderate positive correlation with psychological control ($r = 0.30$, $p < 0.01$), and a small negative correlation between self-image goals and facilitative parenting ($r = -0.27$, $p < 0.01$). Interesting, there was a significant negative association between compassionate goals and total child difficulties ($r = -0.19$, $p < 0.05$), this was not found for self-image goals. All bivariate correlations are reported in Table 3.

Main Analyses Psychological Control

Results of the hierarchical multiple regression, see Table 4, revealed that mother's and child's age in years did not significantly contribute to the regression model at Step One, accounting for a non-significant 1.8% of variance in psychological control, $\Delta R^2 = 0.018$, ΔF (2, 147) = 1.37, $p = 0.258$. At Step 2, child behavior did contribute significantly, accounting for an additional 12.3% of variance in psychological control, $\Delta R^2 = 0.123$, ΔF (1, 146) = 20.95, $p < 0.001$, with greater child behavior problems being associated with greater psychological control ($\beta = 0.37$, $p < 0.001$). At Step 3, parental mental health and self-efficacy did not significantly contribute to the regression model, accounting for a non-significant 2.8% of variance in psychological control, $\Delta R^2 = 0.028$, ΔF (2, 144) = 2.43, $p = 0.09$. At Step 4, and as hypothesized compassionate and self-image goals contributed significantly to the regression model, and together accounted for an additional 23% of variance in psychological control, $\Delta R^2 = 0.231$, ΔF (2, 142) = 27.37, $p < 0.001$. As hypothesized, higher self-image goals were associated with greater psychological control, ($\beta = 0.38$, $p < 0.001$), accounting uniquely for 12.7% of variance. Higher compassionate goals was associated with lower psychological control ($\beta = -0.41$, $p < 0.001$), accounting for 14.1% of variance.

TABLE 2 | Study 1: demographic characteristics, means and standard deviations for predictor and outcome variables.

Variable	Measure	Subscale	Mean	SD	Min.	Max.
Predictor variables						
Age of mother ^a	FBQ		35.24	6.14	19	55
Age of child	FBQ		5.45	1.94	3	9
Child behavior	SDQ		10.91	6.11	1.00	28.00
Parental mental health	DASS-21		11.35	8.57	0.00	51.00
Self-efficacy	PSOC	Efficacy	28.86	5.64	13.00	41.00
Goals	Compassionate and self-image goals scale	Compassionate goals	4.03	0.56	2.56	5.00
	Compassionate and self-image goals scale	Self-image goals	2.48	0.74	1.29	4.43
Outcome variables						
Psychological control	PPC		61.88	13.01	35.00	106.00
Facilitative parenting	FPS		3.77	0.33	2.64	4.45

N = 151 (unless otherwise specified). ^a*n* = 150 (Mother who did not provide age excluded from this analysis). FBQ, family background questionnaire; SDQ, strengths and difficulties questionnaire; DASS-21, depression and anxiety stress scale-21; PSOC, parenting sense of competence. Compassionate goals; Self-image goals; PPC, parental psychological control measure; FPS, facilitative parenting scale.

TABLE 3 | Study 1: bivariate correlations between key variables.

Variables	1	2	3	4	5	6	7	8	9
(1) Age of mother	1.00								
(2) Age of child	0.39**	1.00							
(3) Child behavior problems (SDQ-total score)	-0.21**	0.09	1.00						
(4) Mental health (DASS-21-total score)	-0.35**	0.01	0.35**	1.00					
(5) Parental efficacy (PSOC – efficacy)	-0.13	-0.06	-0.31**	-0.13	1.00				
(6) Compassionate goals	-0.12	-0.06	-0.19*	0.04	0.34**	1.00			
(7) Self-image goals	-0.29**	-0.02	0.12	0.17*	0.09	0.19*	1.00		
(8) Psychological controlling parenting (PPC)	0.03	0.13	0.35**	0.20*	-0.25**	-0.41**	0.30**	1.00	
(9) Facilitative parenting (FPS)	0.20*	0.04	-0.41**	-0.31**	0.34**	0.32**	-0.27**	-0.46**	1.00

N = 150. SDQ, strengths and difficulties questionnaire; DASS-21, depression and anxiety stress scale-21; PSOC – Efficacy, parenting sense of competence – efficacy subscale; PPC, parental psychological control measure; FPS, facilitative parenting scale. **p* < 0.05. ***p* < 0.01.

Together, all seven predictor variables significantly accounted for 40.1% of variance in psychological control, $R^2 = 0.401$, adjusted $R^2 = 0.371$, $F(7, 142) = 13.55$, $p < 0.001$, indicating a large effect size, $f^2 = 0.67$. In the final model the significant predictor variables were compassionate goals (14.1%), self-image goals (12.7%), and child behavior (3%).

Facilitative Parenting

Results of the hierarchical multiple regression, see **Table 5**, found mother's and child's age in years contributed significantly to the regression model at Step One, accounting for 4.3% of variance in facilitative parenting, $\Delta R^2 = 0.043$, $\Delta F(2, 147) = 3.28$, $p = 0.040$. Age of the mother was the only significant predictor, accounting uniquely for 4.1% of variance, with older age associated with greater facilitative parenting ($\beta = 0.22$, $p = 0.013$). At Step 2, child behavior contributed significantly, accounting for an additional 13.6% of variance in facilitative parenting, $\Delta R^2 = 0.136$, $\Delta F(1, 146) = 24.21$, $p < 0.001$, with greater child behavior problems being associated with lower facilitative parenting ($\beta = -0.39$, $p < 0.001$). At Step 3 parental mental health and self-efficacy contributed significantly,

accounting for an additional 8.2% of variance in facilitative parenting, $\Delta R^2 = 0.082$, $\Delta F(2, 144) = 7.94$, $p < 0.001$. Self-efficacy was the only significant predictor, accounting uniquely for 5.9% of variance, with higher self-efficacy being associated with greater facilitative parenting ($\beta = 0.26$, $p < 0.001$). At Step 4, compassionate goals and self-image goals contributed significantly accounting for an additional 11% of variance in facilitative parenting, $\Delta R^2 = 0.110$, $\Delta F(2, 142) = 12.35$, $p < 0.001$. As hypothesized, higher compassionate goals were associated with higher facilitative parenting ($\beta = 0.28$, $p < 0.001$), accounting for 6.5% of unique variance, and higher self-image goals were associated with lower facilitative parenting ($\beta = -0.27$, $p < 0.001$), accounting for 6.3% of unique variance. Together, all seven predictor variables significantly accounted for 37% of variance in facilitative parenting, $R^2 = 0.370$, adjusted $R^2 = 0.339$, $F(7, 142) = 11.91$, $p < 0.001$, indicating a large effect size, $f^2 = 0.59$. In the final model the significant predictors included compassionate goals (6.5%), self-image goals (6.3%), self-efficacy (3.2%), child behavior (2.8%), and then parental mental health (1.7%). We ran both the hierarchical regressions to determine whether socio-economic status variables, including, income,

TABLE 4 | Study 1: summary of hierarchical regression analysis for variables predicting psychological control (PPC scores).

	B	β	95% CI	t	sr²	R²	R²(adj.)
Step 1						0.018	0.005
Age of mother (years)	-0.05	-0.02	[-0.42, 0.33]	-0.24	0.000		
Age of child (years)	0.96	0.14	[-0.22, 2.13]	1.60	0.017		
Step 2						0.141	0.124
Age of mother (years)	0.18	0.09	[-0.18, 0.54]	0.99	0.006		
Age of child (years)	0.46	0.07	[-0.67, 1.59]	0.80	0.004		
SDQ	0.78	0.37	[0.44, 1.12]	4.58***	0.123		
Step 3						0.169	0.141
Age of mother (years)	0.20	0.09	[-0.19, 0.59]	1.01	0.006		
Age of child (years)	0.14	0.06	[-0.71, 1.54]	0.73	0.003		
SDQ	0.61	0.29	[0.24, 0.98]	3.28**	0.062		
DASS-21	0.16	0.11	[-0.08, 0.41]	1.31	0.010		
PSOC-Efficacy	-0.31	-0.14	[-0.69, 0.06]	-1.64	0.015		
Step 4						0.401	0.371
Age of mother (years)	0.34	0.16	[-0.00, 0.68]	1.96	0.016		
Age of child (years)	0.24	0.04	[-0.73, 1.20]	0.48	0.001		
SDQ	0.43	0.20	[0.11, 0.75]	2.68**	0.030		
DASS-21	0.18	0.13	[-0.03, 0.39]	1.69	0.012		
PSOC-Efficacy	-0.11	-0.05	[-0.44, 0.23]	-0.61	0.002		
Compassionate goals	-9.53	-0.41	[-12.80, -6.27]	-5.77***	0.141		
Self-image goals	6.72	0.38	[4.30, 9.14]	5.49***	0.127		

n = 150. SES, socio-economic status; CI, confidence interval; SDQ, strengths and difficulties questionnaire; DASS-21, depression and anxiety stress scale-21; PSOC – Efficacy, parenting sense of competence – efficacy subscale. **p* < 0.05. ***p* < 0.01. ****p* < 0.001.

TABLE 5 | Study 1: summary of hierarchical regression analysis for variables predicting facilitative parenting (FPS scores).

	B	β	95% CI	t	sr²	R²	R²(adj.)
Step 1						0.043	0.030
Age of mother (years)	0.01	0.22	[0.01, 0.02]	2.52*	0.041		
Age of child (years)	-0.01	-0.05	[-0.04, 0.02]	-0.55	0.002		
Step 2						0.179	0.162
Age of mother (years)	0.01	0.11	[-0.01, 0.02]	1.28	0.011		
Age of child (years)	0.01	0.03	[-0.02, 0.03]	0.36	0.000		
SDQ	-0.02	-0.34	[-0.03, -0.01]	-4.92***	0.136		
Step 3						0.260	0.235
Age of mother (years)	0.01	0.12	[-0.01, 0.02]	1.35	0.009		
Age of child (years)	0.01	0.03	[-0.02, 0.03]	0.41	0.001		
SDQ	-0.01	-0.25	[-0.02, -0.01]	-3.04**	0.048		
DASS-21	-0.01	-0.14	[-0.01, 0.00]	-1.76	0.016		
PSOC-Efficacy	-0.02	0.26	[0.01, 0.03]	3.39**	0.059		
Step 4						0.370	0.339
Age of mother (years)	0.00	0.07	[-0.01, 0.01]	0.85	0.003		
Age of child (years)	0.01	0.05	[-0.02, 0.03]	0.69	0.002		
SDQ	-0.01	-0.19	[-0.02, 0.00]	-2.49*	0.028		
DASS-21	-0.01	-0.15	[-0.01, 0.00]	-1.98*	0.017		
PSOC-Efficacy	-0.01	0.20	[0.01, 0.02]	2.70**	0.032		
Compassionate goals	0.16	0.28	[0.08, 0.25]	3.82***	0.065		
Self-image goals	-0.12	-0.27	[-0.18, -0.06]	-3.75***	0.063		

n = 150. CI, confidence interval; SDQ, strengths and difficulties questionnaire; DASS-21, depression and anxiety stress scale-21; PSOC – Efficacy, parenting sense of competence – efficacy subscale. **p* < 0.05. ***p* < 0.01. ****p* < 0.001.

employment status, and education influenced the models for both facilitative and psychological controlling parenting. However, these variables did not contribute any variance to the models.

DISCUSSION

The results of our first study indicated that parental motive, specifically whether it is driven by compassionate or self-image goals, was associated with distinct parenting styles. Self-image goals predicted psychological controlling parenting, whereas compassionate goals predicted facilitative parenting. Although Study 1 provides insight into the importance of goal orientation in relation to parenting style, it does not allow for causal inferences. Thus, Study 2 will examine the link between goals and emotions in a parenting context using an experimental design.

STUDY 2

The cross-sectional nature of the first study limits the capacity to draw causal inferences about the influence of compassionate and self-image goals in a parenting context. A second study was conducted to address this limitation by experimentally manipulating compassionate and self-image goals in an online questionnaire. This study was based on the previous experimental work of Breines and Chen (2012) who found that self-compassion can increase self-improvement motivation after experiencing a failure. In study 2 participants were randomized to either a compassionate, self-image, or control condition. Conditions were manipulated by varying the instructions provided to participants (adapted from Breines and Chen, 2012, Study 3). Participants then read about various difficult parenting scenarios and reported their emotional responses. The control condition was included to examine baseline emotional responses in the absence of any goal orientation stimuli.

It was hypothesized that those in the compassionate goal condition would experience more positive and less negative emotional responses compared to those in the self-image goal (H1) and control (H2) conditions. We also explored whether those in the self-image goal condition would experience more negative and less positive emotional responses compared to the control condition.

MATERIALS AND METHODS

Design and Participants

The study used a between-groups experimental design, with a manipulated between-groups variable of goal orientation. Participants were randomly allocated to one of three conditions, (a) compassionate goal, (b) self-image goal, or (c) control. The dependent variables were self-reported emotions in response to parenting scenarios. Demographics were measured using the FBQ and psychological control was measured using the PPC to control for differences between groups in age of the mother and child and trait psychological control (see section “Study 1”).

The study was advertised in the same way as Study 1. An a priori power analysis using the software program G*Power

(Faul et al., 2007) indicated that 159 participants would be required to obtain adequate power (0.80) to detect a medium effect size of 0.25 at the standard 0.05 alpha error probability. A total of 270 respondents voluntarily accessed the online survey. Parents with a child aged 3–9 years were eligible to participate. Fifty-three participants were excluded (not a parent, $n = 3$; child not aged 3–9 years, $n = 4$; did not read instructions upon allocation to condition, $n = 1$; missing all data, $n = 33$; only provided demographic information, $n = 12$). There were 6 males (2.76%) and 211 females (97.2%). As in Study 1, males were removed from further analyses. A further 13 participants were excluded due to inadequate sampling, leaving a final sample of $N = 198$ mothers aged 21–55 years ($M = 36.05$ years, $SD = 6.10$) with a child aged 3–9 years ($M = 5.43$ years, $SD = 2.02$). Participants were randomly allocated to conditions, with 70 allocated to the compassion condition, 66 to self-image and 62 to the control. There was no significant difference in age of the mother, age of the child or psychological control across conditions (see Table 6).

Measures

Demographic Information

The FBQ was used to collect demographic information (see Study 1).

Emotional Responses

Participants were asked to imagine their child in a variety of brief parenting scenarios, adapted from Kirby et al. (2019). There were six scenarios in total describing problematic behavior of the child. These scenarios included: (1) imagine your child having a tantrum in public; (2) imagine your child is not doing well at childcare/school; (3) imagine your child has been accused of bullying; (4) imagine your child doesn't do what you ask them when in public; (5) imagine your child swears when in public; and (6) imagine your child hits another child and makes them cry when in public. Participants' reactions to each parenting scenario was assessed using a subscale of emotions, and a subscale of reflect shame, that has been used previously in the Kirby et al. (2019) study.

Emotions

Participants' emotional responses to the parenting scenarios were measured for seven different emotions adapted from Goetz et al. (2010), which was also used in the Kirby et al. (2019) study. Participants were asked to indicate what emotions they felt in terms of anxiety, stress, sadness, anger, frustration, calmness and sympathy. Participants responded on a 10-point Likert scale from 1 (*Not at all*) to 10 (*The most you could feel*). An average score was then calculated across all six scenarios for each emotion. Higher scores for each emotion indicated higher levels. Internal consistency for each emotion across the six scenarios was good (ranging from $\alpha = 0.75$ to $\alpha = 0.87$).

Reflected Shame

Three items that assessed reflected shame that was experienced in relation to the parenting scenarios, which was also used in the Kirby et al. (2019) study. Participants were asked “*To what*

TABLE 6 | Study 2: participant demographic characteristics and trait psychological control according to condition.

	Compassion (n = 70)		Self-Image (n = 66)		Control (n = 62)		Difference between conditions	
	M	SD	M	SD	M	SD	F (2, 194)	p
Demographics								
Age of mother ^a (n = 197)	36.01	6.21	35.62	6.12	36.55	6.01	0.37	0.692
	M	SD	M	SD	M	SD	F (2, 195)	p
Age of child	5.62	2.12	5.23	1.87	5.36	2.03	0.68	0.508
Control measure	M	SD	M	SD	M	SD	F (2, 195)	p
Psychological control	62.07	13.17	64.93	18.17	61.13	13.90	1.10	.336

^aOne participant in the compassion condition did not disclose their age.

extent would you worry that other people would" (1) See you as an incompetent parent, (2) Look down on you, and (3) See you as a bad parent on a 7-point Likert scale from 1 (Strongly Disagree) to 7 (Strongly Agree). An average score was then calculated across all six scenarios for each reflected shame item. Higher scores indicated greater reflected shame. Internal consistency was good (ranging from $\alpha = 0.84$ to $\alpha = 0.85$).

Psychological Control

The PPC measure used in Study 1 was similarly used to measure trait psychological control. Internal consistency for Study 2 was excellent ($\alpha = 0.93$).

Procedure

A convenience sample was used involving snowball sampling via online social media, which meant a website link would be posted, which when clicked, would direct participants to take part in the experiment. Participants completed the experiment using the online survey software package Qualtrics™. All the participants provided written online informed consent before the start of their participation.

After completing the demographic details, participants were then randomly assigned to one of three experimental conditions using the randomization function within Qualtrics: (a) compassionate goal, (b) self-image goal, or (c) control condition. Participants were then presented with a set of instructions that differed depending on condition, which contained the manipulation, adapted from Breines and Chen (2012), Study 3.

Those in the compassionate goal condition read: "In this next section we want you to remember that parenting is hard. We all face challenges, setbacks and disappointments. You are not alone with this. Try not to be too hard on yourself. We all try our best. Please answer the next set of questions with this in mind." Those in the self-image condition read: "In this next section, we want you to remember that parents try to avoid making mistakes so that they don't look like a bad parent. We try to get our children to do things our way because we know what is best for them. We all try our best. Please answer the next set of questions with this in mind." Those in the control condition read: "In this next section, please answer the questions as best as you can."

Following the instructions, participants were then presented with six parenting scenarios, which they were asked to read and then indicate their emotional responses to each scenario.

Participants then completed a set of manipulation check questions, followed by the PPC. In total, the average time to complete the online experiment was 15 min.

Manipulation Checks

Three questions were included to assess whether participants fully engaged with the online study. The first question "How well do you remember the instructions that you were provided with before responding to the parenting scenarios?" was rated on a seven-point Likert scale from 1 (Extremely well) to 7 (Not well at all). Two questions "Did you closely read the initial instructions prior to reading about parenting scenarios?" and "Did the instructions help you to feel compassionate when responding to the parenting scenarios?" were rated on a seven-point Likert scale from 1 (very true) to 7 (untrue).

Data Analysis Plan

Prior to conducting analyses, missing data and assumptions were examined. Preliminary analyses compared the three conditions (compassionate goal, self-image goal and control) on demographic items and psychological control using one-way between-groups analysis of variance (ANOVAs). Manipulation checks were also assessed.

For experimental analyses, one-way between-groups ANOVAs were conducted to test whether those in the compassionate goal condition would experience more positive and less negative emotional responses compared to those in the self-image goal and control conditions and whether those in the self-image goal condition would experience more negative and less positive emotional responses compared to the control condition. To control for type one errors, Bonferroni adjustment was used, with a threshold for statistical significance of $\alpha = 0.005$, two tailed.

RESULTS

Data Screening

Missing Data

Analyses were conducted to determine the pattern of missing data for the dependent variables, manipulation check items, and PPC items. All variables were adequately assessed with data obtained for more than 50% of participants. Missing Values Analysis revealed a non-significant Little's MCAR test $\chi^2 (457, N = 198) = 478.88, p = 0.231$, indicating that

the data were MCAR. Expectation Maximization was used to estimate missing data.

Preliminary Analyses

Control Measures

Demographics

A one-way between-groups ANOVA was conducted to compare the three conditions in terms of age of the mother and child. There were no significant differences between groups, suggesting that the randomization process produced equally comparable groups (see **Table 6**).

Psychological control

A one-way between-groups ANOVA was conducted to compare conditions according to total PPC scores. There was no significant difference between groups, suggesting that the randomization process produced equally comparable groups (see **Table 6**).

Manipulation checks

One-way between-groups ANOVAs were conducted to assess manipulation checks. The first check assessed memory for condition instructions. There was no significant difference between the compassion ($M = 2.59$, $SD = 1.65$), self-image ($M = 2.50$, $SD = 1.43$), and control ($M = 3.17$, $SD = 1.93$) conditions in memory for the instructions, $F(2, 195) = 3.02$, $p = 0.051$. The second check assessed whether participants closely read the instructions. Results revealed a significant difference between conditions, $F(2, 195) = 14.03$, $p < 0.001$, $\eta^2 = 0.13$. *Post hoc* comparisons using the Tukey HSD test indicated that participants in the control condition ($M = 3.30$, $SD = 1.90$) were less likely to have closely read the instructions compared to the compassion ($M = 2.10$, $SD = 1.37$) and self-image ($M = 1.99$, $SD = 1.35$) conditions. The third check assessed whether the manipulation increased compassion within the participant. Results revealed a significant difference between conditions $F(2, 195) = 5.94$, $p = 0.003$, $\eta^2 = 0.06$, with a medium effect. *Post hoc* comparisons using the Tukey HSD test indicated that participants in the control condition ($M = 4.49$, $SD = 1.75$) felt less compassionate compared to the compassion ($M = 3.77$, $SD = 1.75$) and self-image ($M = 3.49$, $SD = 1.55$) conditions.

Main Analyses

Emotional Responses

One-way between-groups ANOVAs were conducted to compare the effect of goal orientation (compassion, self-image and control) on participant's emotional responses in terms of emotions and reflected shame in response to the brief parenting scenarios. There was no significant difference between conditions across the seven emotions items or the three reflected shame items, all $p > 0.005$. See **Table 7** for a summary of all emotional responses.

Age of Child

We also conducted a series of ANOVAs to determine whether age of the child influenced the emotional response of the parent in our scenarios. We found no significant differences in the emotional responses reported by parents across child's age.

DISCUSSION

Parents were randomly assigned to either a compassionate goal, self-image goal or control condition. Conditions were experimentally manipulated by varying the framing of instructions provided to participants. Inconsistent with all hypotheses, no differences in emotional responses were observed between conditions. Our view is the brief instructions provided to induce compassionate and self-image orientation were insufficient, and potentially a stronger intervention such as a meditation exercise (e.g., 10 min listening to audio guided exercise) might be more appropriate and helpful to tap into motivational shift. In sum, the findings of Study 2 suggest that emotional responses to difficult parenting scenarios do not differ according to whether participants were prompted with compassionate goal, self-image goal, or control instructions.

GENERAL DISCUSSION

Does a parent's motivation matter when it comes to parenting? Our findings are somewhat mixed, but it would appear that parental motivation does at least have some impact on parental style. However, further experimental work is needed to determine how modifiable compassionate motivational shift can be with parents, and whether this changes emotional reactions to difficult parenting scenarios.

To the best of our knowledge, this is the first study that has specifically examined parental motivation and how it may predict parenting style. In support of our pre-registered hypotheses we found that that high self-image goals were uniquely associated with greater psychological control, after accounting for child behavior, parental mental health, and parental self-efficacy. Specifically, the results suggest that the more an individual had self-image goals, the more they reported the use of psychologically controlling parenting. This finding is consistent with previous research by Mills et al. (2007), and similarly indicates that self-focused concerns may lead to psychologically controlling parenting. As previously discussed, people with self-image goals are theorized to operate from an *egcosystem* motivational perspective, which is characterized by prioritization of one's own needs (Crocker et al., 2009) and construction of a public image that reflects the individual's ideal self (Crocker and Canevello, 2008; Crocker et al., 2009). The finding that self-image goals predict psychological control is consistent with *egcosystem* theory, in that those with self-image goals may employ psychological control strategies to control the child in order to meet their own needs, at the expense of the child's development of an independent sense of self.

We also found support for our second hypotheses that high compassionate goals were uniquely associated with greater facilitative parenting, after accounting for child behavior, parental mental health, and parental self-efficacy. Specifically, the more an individual had compassionate goals, the more they reported the use of warm and responsive parenting behaviors, characterized by facilitative parenting. This finding is consistent with previous research showing that compassion is associated

TABLE 7 | Study 2: one-way between-groups ANOVA results for dependent measure outcomes between compassion, self-image and control conditions.

Dependent variable	Compassion (<i>n</i> = 70)			Self-image (<i>n</i> = 66)			Control (<i>n</i> = 62)			Difference between conditions	
	<i>M</i>	<i>SD</i>	95% CI	<i>M</i>	<i>SD</i>	95% CI	<i>M</i>	<i>SD</i>	95% CI	<i>F</i> (2, 195)	<i>p</i>
Emotions											
Anxiety	5.57	2.13	[5.16, 6.18]	5.65	1.98	[5.16, 6.13]	5.66	1.67	[5.23, 6.08]	0.00	0.998
Stress	6.05	1.92	[5.59, 6.51]	5.85	1.81	[5.40, 6.29]	5.95	1.69	[5.52, 6.38]	0.22	0.806
Sadness	5.28	1.74	[4.87, 5.70]	5.16	1.74	[4.74, 5.58]	5.56	1.83	[5.10, 6.03]	0.87	.423
Anger	4.86	2.14	[4.36, 5.37]	5.00	1.78	[4.57, 5.44]	4.73	1.84	[4.25, 5.19]	0.33	0.718
Frustration	5.73	2.12	[5.23, 6.24]	5.81	1.63	[5.41, 6.21]	5.90	1.75	[5.46, 6.34]	0.13	0.876
Calm	3.65	1.79	[3.23, 4.08]	4.39	1.65	[3.99, 4.80]	3.61	1.69	[3.18, 4.04]	4.35	0.014
Sympathetic	4.26	1.36	[3.94, 4.59]	4.88	1.41	[4.53, 5.22]	4.36	1.65	[3.94, 4.78]	3.36	0.037
Reflected shame											
Incompetent	4.25	1.27	[3.95, 4.56]	4.43	1.21	[4.14, 4.73]	4.04	1.20	[3.73, 4.34]	1.63	0.198
Looked down on	4.30	1.30	[3.99, 4.61]	4.52	1.19	[4.22, 4.81]	4.02	1.19	[3.71, 4.32]	2.64	0.074
Bad parent	4.25	1.24	[3.77, 4.38]	4.45	1.17	[4.16, 4.74]	4.08	1.21	[3.77, 4.38]	1.49	0.227

ANOVA, analysis of variance; CI, confidence interval. Alpha set to 0.005.

with responsiveness to the needs of others (Canevello and Crocker, 2011) and greater observed warmth in mothers during interaction with their child (Miller et al., 2015). Additionally, this result aligns with the theory that people with compassionate goals operate from an *ecosystem* motivational perspective, through an understanding of interconnectedness with others (Crocker et al., 2009). Specifically, those with compassionate goals are responsive to the needs of others, evidenced by the use of warm and responsive parenting strategies that support the child's social skills and relationships.

Exploratory analysis revealed that high compassionate goals were related to reduced psychological control, and that high self-image goals were related to reduced facilitative parenting, after accounting for child behavior, parental mental health, and parental self-efficacy. This suggests that a compassionate goal orientation is associated with reduced psychologically controlling parenting, whereas a high self-image goal orientation is associated with reduced facilitative parenting. Importantly, compassionate goals were found to have the strongest explanatory power in both psychological control and facilitative parenting.

Inconsistent with hypotheses, Study 2 found that those who were prompted to adopt compassionate goals did not experience more positive and less negative emotional responses compared to those in the self-image goal and control conditions, in response to reading about difficult parenting situations. Moreover, we found no age interactions, thus implying our scenarios seemed to work similarly with all ages. This finding is inconsistent with previous research showing that self-image goals are linked to anxiety and stress (Erickson et al., 2018) and that self-compassion is linked to more positive and less negative emotional responses in parents (Kirby and Baldwin, 2018). Moreover, the findings are inconsistent with previous research from which Study 2 was adapted, which showed that a subtle reminder to be self-compassionate following initial failure at a test lead to increased time spent studying for a subsequent test compared to those who read a self-esteem statement or those in the no intervention control condition (Breines and Chen, 2012, Study 3).

Although Study 2 was the first to experimentally manipulate goal orientation, we were unable to establish a causal link between goals and emotional responses to difficult parenting situations. We propose that there are at least three possible explanations for this. First, results revealed that the manipulation was unsuccessful, as those in the compassionate goal and self-image goal conditions felt equally compassionate compared to the control. Thus, it is possible that the brief instructions were insufficient to induce compassionate and self-image goal orientations as intended. This could be partly due to the instructions. That is, the self-image instructions could have inadvertently elicited aspects of self-compassion, particularly in relation to common humanity. The self-image instructions describes how all parents try to avoid making mistakes and try not to look like a bad parent. Instead of priming parents for self-image goals this may have elicited a sense of common humanity, as it indicated that we are not alone with our uncertainties and self-image worries but that we share these with other parents. Thus, the intended self-image goal prompt might actually be a self-compassionate prompt, specifically in relation to common humanity. This is supported by the manipulation checks that showed differences in feelings of compassion for those in control condition as compared to compassion condition as well as self-image condition (but not between compassion and self-image).

Second, Breines and Chen (2012) found the self-compassionate prompt was able to facilitate greater motivation in university students to pass an exam, this finding might not generalize to parents, where there is an interaction between two individuals (parent and child). In contrast to an instructional prompt that was used in our study, in a previous study we used a 15-min Loving-Kindness Meditation, where parents focused on sending intentions of good will to oneself, a person that made them smile (e.g., their child), a stranger, someone they disliked, and to a group of people (e.g., a family). In the Kirby and Baldwin (2018) study they found the 15-min meditation led to increased positive responses to the vignettes (e.g., calm and sympathetic) and less negative responses (e.g., frustration and

anger) compared to a focused imagery group. We suggest, that for parents, a longer and more embodied intervention such as the LKM meditation is required to bring about emotional shift to stressful parenting situations. This suggestion is in line with recent findings from Matos et al. (2018) who found that brief compassionate mind training was effective in helping individuals with distress, but this was moderated by an individual's capacity to embody compassion. Embodiment refers to an individual's ability to bring and feel compassion into everyday life. For example in a stressful parenting situation slowing the breath and trying to think through, "*If I was at my compassionate wisest and strongest how would I like to think, how would I like to act, in this moment.*" We suggest future research should examine a parent's capacity to embody compassionate motivation, as this could be a key aspect to facilitating shift to compassionate goals. Moreover, we adopted a between-groups design, a pre-post design with a longer intervention might be more appropriate to assess for motivational shift in parents (Kirby et al., 2019).

Third, the current study measured emotions adapted from Goetz et al. (2010), which were trait-based emotions. In contrast, Breines and Chen (2012), Study 3 assessed self-improvement behavior by measuring time spent studying for a test, which is a commonly used and objective and sensitive measure (Di Paula and Campbell, 2002; Williams and Desteno, 2008). Thus, the measurement of emotions may have been less sensitive, and the brief instructions may have been unable to override parents' trait emotions.

Implications for Compassion and Parenting Programs

The finding that a compassionate goal orientation was the strongest predictor of positive facilitative parenting, as well as lower levels of psychological controlling parenting, supports the growing call for parenting programs to consider integrating compassion-based approaches within their intervention design (Coatsworth et al., 2010; Kirby, 2017; Waters, 2017). Compassion Focused Therapy (Gilbert, 2014) was developed to cultivate compassionate motivation to help individuals who struggle with self-criticism and shame, with a growing evidence-base supporting its effectiveness (Kirby et al., 2017). Compassion Focused Therapy is theoretically informed by social mentality theory, which is consistent with Crocker and Canevello's (2008) ego- and ecosystem model. However, given the lack of findings in Study 2 regarding the use of an instructional prompt to facilitate motivational shift in parents, further work is needed to determine what level of dosage is required to help facilitate change.

Limitations and Directions for Future Research

Although the present research has provided a deeper insight parental motivation, there are a number of limitations that should be addressed. First, only a small proportion of males volunteered to participate in both studies. Thus, the decision was made to exclude males, limiting generalizability to fathers. By excluding fathers it meant we could exclusively examine the role of parental motives and shame proneness in mothers, and as the

majority of parenting research has been conducted with mothers it allows for easier comparisons to past research (Nowak and Heinrichs, 2008). However, this is a limitation of our study and future research should actively recruit equivalent proportions of mothers and fathers. Moreover, research has shown differential effects between mothers and fathers, with an indirect association between shame proneness and psychological control, through a worrisome approach toward the child identified among fathers (Mills et al., 2007). Thus, it would also be important to compare compassionate and self-image goals in mothers and fathers in order to determine whether they operate similarly for both parents.

A further limitation of the current research is that recruitment relied on self-selection. People who volunteer their time for the purpose of psychological research tend to be highly conscientious (Lönngqvist et al., 2007) and have greater intellectual ability, interest and motivation compared to non-volunteers (Rosenthal, 1965). Future research could include an incentive for participation to encourage participation from a more representative sample to minimize bias and increase generalizability of results. Another limitation is that both studies relied on self-report measures. Thus, participants' responses may not reflect how parents actually behave with their children, limiting generalizability of results to parents' behavior. Moreover, although the parenting scenarios used in Study 2 have been used previously (Kirby et al., 2019), they were hypothetical scenarios and may not reflect the parents child's behavior. Current research relies heavily on introspection and hypothetical responses, thus the need for behavioral observation has been suggested (Baumeister et al., 2007). Future research in the form of an observational study could further inform our understanding of the influence of compassionate and self-image goals on parenting. This could involve measuring compassionate and self-image goals in parents and providing parents with difficult tasks to complete with their child, such as the challenging puzzle and origami tasks used by Miller et al. (2015). As in the study conducted by Miller et al. (2015), warmth (e.g., praise, encouragement, and hugs) and negativity (e.g., criticism, aggravated tone, and disapproval) could similarly be observed and coded to examine the link between goals and positive and aversive parenting behaviors. It could be anticipated that those with high compassionate goals would display greater warmth and reduced negativity compared to those with high self-image goals.

Finally, in relation to Study 2, given trait compassion and self-esteem have been found to be strongly associated with self-image goals and compassionate-goals, we could have included assessment measures to control for this to exclude the possibility that dispositional characteristics would differ between the groups.

CONCLUSION

The present research is the first to examine compassionate and self-image goals in parents. The findings suggest that in addition to child behavior, parental mental health, and self-efficacy, a high self-image goal orientation is linked to increased psychologically controlling parenting, whereas a high

compassionate goal orientation is linked to greater facilitative parenting. Our findings suggest instructional prompts for motivational shift are unsuccessful, and possibly stronger interventions are required when attempting to shift parents from self-image to compassionate motives. It is recommended that further experimental work is conducted that attempts to cultivate compassionate motivation in parents to determine whether this can influence change in parental style and child outcomes.

ETHICS STATEMENT

This study was carried out in accordance with the recommendations of The University of Queensland Ethics Board

Committee with informed consent collected from all subjects. All subjects gave informed consent in accordance with the Declaration of Helsinki. The protocol was approved by The University of Queensland Ethics Board Committee.

AUTHOR CONTRIBUTIONS

JK came up with the original idea of study one and assisted OG with data analysis and writing. OG helped to design study two and executed both study one and study two, and assisted with the data analyses, and helped to writing the manuscript. PG collaborated in the writing and editing of the final manuscript. All authors approved the final version of the manuscript for submission.

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Work-Family Conflict and Mindful Parenting: The Mediating Role of Parental Psychopathology Symptoms and Parenting Stress in a Sample of Portuguese Employed Parents

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Aims: The aims of the current study are to examine whether parents' work-family conflict, emotional distress (anxiety/depressive symptoms and parenting stress) and mindful parenting vary according to the type of employment (full-time, part-time, and occasional), the type of work schedule (fixed, flexible, and shift), and the number of working hours per week and to explore whether parental emotional distress mediates the association between work-family conflict and mindful parenting dimensions.

Methods: A sample of 335 employed parents (86.3% mothers) of children and adolescents between the ages of 1 and 19 years old completed a sociodemographic form and measures of work-family conflict, anxiety/depression symptoms, parenting stress, and mindful parenting. The differences in study variables among types of employment, work schedules and number of weekly working hours were analyzed. A path model was tested through structural equation modeling in AMOS to explore the indirect effect of work-family conflict on mindful parenting dimensions through anxiety, depression and parenting stress. The invariance of the path model across children's age groups (toddlers, preschool and grade school children, and adolescents) and parents' gender was also examined.

Results: Parents with a shift work schedule, working full-time and 40 h or more per week, presented significantly higher levels of work-family conflict than those with a fixed or flexible schedule, working part-time and less than 40 h per week, respectively. Parents with a flexible work schedule presented significantly higher levels of self-regulation in parenting and of non-judgmental acceptance of parental functioning than parents with a shift work schedule. Higher levels of work-family conflict were associated with lower levels of mindful parenting dimensions through higher levels of anxiety/depression symptoms and parenting stress. The model was invariant across children's age groups and parents' gender.

Discussion: Work-family conflict is associated with poorer parental mental health and with less mindful parenting. Workplaces should implement family-friendly policies (e.g., flexible work arrangements) that help parents successfully balance the competing responsibilities and demands of their work and family roles. These policies could have a critical impact on the mental health of parents and, consequently, on their parental practices.

Keywords: mindful parenting, parents, parenting stress, parental anxiety symptoms, parental depressive symptoms, work-family conflict

INTRODUCTION

Balancing the dual demands of work and parenting pose a great challenge to contemporary parents. Labor markets are becoming increasingly competitive and insecure, requiring parents to make a great commitment to work and dedicate much of their family and personal time to their jobs. In Portugal, the employment rate for all Portuguese mothers (aged 15–64) with at least one child aged 0–14 is 75.7% (68.4% working full-time), which is higher than the OECD average (66.2%) and one of the highest rates among OECD countries. The proportion of children (aged 0–14) that live in households where both parents work full-time is 61.9%, which is also higher than the OECD average of 56%. In addition, family-friendly workplace policies, which are key determinants of a family ability to reconcile work and family life, are not employed by the majority of companies in Portugal. For instance, only 34.5% of companies report providing flexible working time arrangements, such as the possibility to accumulate hours for days off (full or half days) and to vary the start and end of daily work, to at least some employees (the OECD average is 53.4%) (OECD, 2019).

Some studies show that the pressure parents feel on their jobs (e.g., to display greater commitment and dedication) along with certain working conditions (e.g., inflexible work schedules and work overload) may create a work-family conflict and have a strong impact on parents' well-being and on their parental behaviors (e.g., Costigan et al., 2003). When experiencing this conflict between the incompatible demands of work and family, parents may feel high levels of distress (e.g., anxiety, depression, and parenting stress), which, in turn, can have a negative impact on their parenting behaviors and practices, including their ability to adopt a mindful approach to parenting.

Mindful Parenting

Over the last decade, several researchers, particularly those interested in family and parent-child relationships, have been showing an increasing interest in the study of the applications of mindfulness to the parenting context (e.g., Dumas, 2005; Singh et al., 2007; Bögels and Restifo, 2014; Parent et al., 2016a). Mindful parenting is a parental approach that can be simply described as bringing non-judgmental, compassionate, and present-centered awareness into parent-child interactions (Kabat-Zinn and Kabat-Zinn, 1997; Bögels and Restifo, 2014; Bögels et al., 2014). According to Kabat-Zinn and Kabat-Zinn (1997), the authors who made popular the term *mindful parenting*, this parental approach “means seeing if we can

remember to bring this kind of attention and openness and wisdom to all moments with our children” (p. 25); it “is a continual process of deepening and refining our awareness and our ability to be present and to act wisely” (p. 28).

Mindful parenting offers an alternative to the automatic pilot mode in which so many parents live (Kabat-Zinn and Kabat-Zinn, 1997), allowing them to *be* in the present moment when interacting with their children, to be sensible and responsive to their child's needs, and to exert self-regulation in difficult moments with the child and thereby choose parenting behaviors (rather than reacting automatically) that are in accordance with their parental values and goals (Duncan et al., 2009). Being a mindful parent implies that parents are able and willing to be open and receptive to their children's behaviors, thoughts and emotions, without judging them and automatically reacting to them, so parents can truly see and understand their children and act in a sensitive manner (Bluth and Wahler, 2011).

For Duncan et al. (2009), mindful parenting encompasses several dimensions, such as the ability to listen to the child with full attention (i.e., being fully present and with complete attention to the child in parent-child interactions), greater self-regulation in parenting (i.e., being able to regulate the emotions and behaviors in parent-child interactions), greater emotional awareness of the child (i.e., being able to notice and correctly identify the child's emotions), an attitude of compassion toward the child (i.e., being able to be kind, sensible and responsive to the child's needs), and a non-judgmental acceptance of parental functioning (i.e., being able to accept without criticizing the self as a parent) (Duncan et al., 2009; de Bruin et al., 2014; Moreira and Canavarro, 2017).

Bringing mindful awareness to parent-child interactions promotes a higher quality parent-child relationship (Duncan et al., 2009). There is some evidence that mindful parenting is associated with less parenting stress (Beer et al., 2013; Bögels and Restifo, 2014; Bögels et al., 2014; Gouveia et al., 2016; Moreira and Canavarro, 2018b), more positive parenting styles and practices (Williams and Wahler, 2010; de Bruin et al., 2014; Gouveia et al., 2016; Parent et al., 2016b; Moreira and Canavarro, 2017), and a more secure attachment relationship between the parents and the child (Medeiros et al., 2016; Moreira et al., 2018b). Mindful parenting was also shown to be associated with several positive outcomes for children and adolescents, such as lower levels of internalizing and externalizing problems (Geurtzen et al., 2015; Parent et al., 2016b), greater psychosocial wellbeing (Medeiros et al., 2016), and a lower likelihood of substance use (Turpyn and Chaplin, 2016). In addition, interventions aimed

at promoting the development of mindful parenting skills (e.g., Bögels and Restifo, 2014) proved to be highly effective in reducing parenting stress and promoting positive parenting practices and the psychological adjustment of parents and children in different groups of parents (e.g., Singh et al., 2006, 2007; van der Oord et al., 2012; Bögels et al., 2014; Potharst et al., 2017).

Mindful parenting, like other parenting styles and practices, is multiply determined and can be influenced by intersecting parent (e.g., personality, mental health, and gender), child (e.g., temperament and age), and social (e.g., parents' work context) variables (Belsky, 1984). For instance, with regard to parent variables, we have shown that parents' attachment and caregiving orientations (Moreira and Canavarro, 2015; Moreira et al., 2016), self-compassion and dispositional mindfulness (Gouveia et al., 2016), and self-critical rumination (Moreira and Canavarro, 2018b) were important internal variables that could play a role in mindful parenting. The gender of parents is also an important variable in determining levels of mindful parenting. In previous investigations, we have shown that women presented higher levels of mindful parenting than men, although these studies have only explored the gender differences in the total score of the mindful parenting scale and not in the different mindful parenting dimensions (Moreira and Canavarro, 2015; Medeiros et al., 2016).

Other potential determinants of mindful parenting are the parents' mental health and their levels of parenting stress (i.e., the stress that results from perceiving the demands of parenting as exceeding personal and social resources to cope with those demands; Abidin, 1992). In fact, there is ample evidence that parental psychopathology and parenting stress are among the strongest risk factors for negative parenting behaviors (Goodman and Gotlib, 1999; Lovejoy et al., 2000; Goodman, 2007; Shea and Coyne, 2011; Goodman and Garber, 2017), which supports the hypothesis that more depressed, anxious or stressed parents would struggle more to bring mindful awareness to the relationship with their children. Although the role of parents' mental health on mindful parenting has been little investigated, in a previous study, we found that mothers reporting clinically significant levels of anxiety and/or depression symptoms presented lower levels of all the dimensions of mindful parenting (Moreira and Canavarro, 2018a). In another study, we have also shown that higher levels of parenting stress were associated with lower levels of mindful parenting (Gouveia et al., 2016). When exploring the contribution of psychopathology and parenting stress on parenting behaviors, it is important to note that the relationship between these variables can be bidirectional. While some studies have shown that depression and/or anxiety symptoms increase the likelihood of parenting stress (Williford et al., 2007; Pritchard et al., 2012), others have demonstrated that parenting stress lead to psychopathology symptoms (Thomason et al., 2014; Weitlauf et al., 2014; Vismara et al., 2016; Rollè et al., 2017), and still others have treated parenting stress and depression symptoms as same-level variables (Ponnet et al., 2013).

Children characteristics, as their age or developmental stage, can also be important determinants of parenting. Children and adolescents of different ages pose different challenges for parents

(Galinsky, 1987) and, therefore, potential differences in parenting practices and behaviors should be always considered when conducting studies that include parents of children in different stages of development. Nevertheless, previous research suggested that mindful parenting do not vary according to children's age group. For instance, Medeiros et al. (2016) found no significant differences between parents of children aged 8–12 years and parents of adolescents aged 13–19 years and Moreira et al. (2018b) found no significant differences between parents of adolescents in the yearly and middle/late stages of adolescence. More distal variables of the social context, such as the parents' working context, may also have an important role in determining how mindful parents can be in their parental role. However, the role of work-related variables in mindful parenting has never been investigated.

Work-Family Conflict and Parenting

In recent decades, there has been increasing interest in understanding the influence of parents' work context on parenting. Research on the work-family interface has shown that parents' work experiences have a considerable impact on their parenting behaviors and on the overall quality of their family life (Crouter and Bumpus, 2001). For instance, stressful work conditions (e.g., work overload, feelings of pressure, low autonomy, long work hours, inflexible schedules or a negative work environment) have been linked to more negative (e.g., intrusive and less sensitive) parent-child interactions (Costigan et al., 2003), more harsh and less warmth and responsive parenting behaviors (Greenberger et al., 1994), lower emotional and behavior involvement in parent-child interactions (Repetti and Wood, 1997), and less frequent leisure and childcare activities with children (Bass et al., 2009; Roeters et al., 2010). Stressful working conditions have also been associated with poorer mental health in parents (Perry-Jenkins et al., 2017) and children (Johnson et al., 2013; Dockery et al., 2016). For example, some types of work schedules, such as shift work, have been associated with more mental and physical health problems (Figueiro and White, 2013; Cho, 2018).

Reconciling work and family-related responsibilities, often without any support from family or others and frequently in competitive, stressful, and insecure jobs, is a challenge that many working parents face today. This conflict between the competing responsibilities and demands of work and family contexts has been labeled a "work-family conflict" and was defined as "a form of inter-role conflict in which the role pressures from the work and family domains are mutually incompatible so that participation in one role is made more difficult by participation in another role" (Greenhaus and Beutell, 1985, p. 77). This interrole conflict may have two distinct directions – work interfering with family and family interfering with work – each presenting distinctive determinants and consequences (Byron, 2005; Michel et al., 2011). In this study, the term *work-family conflict* is used to describe the interference of work with family.

The work-family conflict has been linked to particular work conditions, including working long hours and having inflexible working schedules (Cooklin et al., 2015a), having a shift work schedule (Barnett et al., 2008; Mauno et al., 2015), and having

a full-time job as opposed to a part-time job (Higgins et al., 2000; Hill et al., 2004). Previous research has also shown that work-family conflict may depend on the parents' gender. With the increase in the number of dual-earner families over time and the fact that parents have more traditional implicit gender-role stereotypes (i.e., women's role as homemaker and men's role as economic provider) than non-parents (Endendijk et al., 2018), the work-family conflict has been an issue for both parents. However, mixed results with regard to gender differences have been reported in the literature. While most studies show higher levels of conflict among women (Cinamon and Rich, 2002; Lee et al., 2003; Ahmad and Omar, 2008), others have found higher levels of conflict among men (Allen and Finkelstein, 2014), and still others have found no differences between men and women (Duxbury and Higgins, 1991).

Work-family conflict is currently considered a major social determinant of parents' family environment and parenting behaviors (Dinh et al., 2017). Several studies have shown that parents experiencing higher levels of work-family conflict have lower quality parent-child interactions (Lau, 2010; Vieira et al., 2016), which are characterized, for instance, by irritable, less warm and inconsistent parenting behaviors (Cooklin et al., 2015b, 2016). Parents experiencing this interrole conflict were also shown to report lower parental self-efficacy (Cinamon et al., 2007) and lower parental satisfaction (Vieira et al., 2012). Work-family conflict has also been linked to child mental health. For instance, some studies found that work-family conflict was positively associated with children's emotional distress (Strazdins et al., 2013; Vieira et al., 2016; Vahedi et al., 2018) and negatively associated with children's self-esteem (Lau, 2010).

One of the possible vehicles through which work-family conflict can impact parenting behaviors, including mindful parenting behaviors, is the mental health of parents and their levels of parenting stress (i.e., perceiving the actual demands of parenting as exceeding personal and social resources to cope with those demands; Abidin, 1992). In fact, several studies have shown that higher levels of work-family conflict are associated with poorer parents' mental health (Kinnunen et al., 2004; Cooklin et al., 2015a; Westrupp et al., 2016) and with higher levels of parenting stress (Kinnunen et al., 2004; Vieira et al., 2012).

The Present Study

This study had two main goals. First, we aimed to explore whether work-family conflict, anxiety/depression symptoms, parenting stress, and mindful parenting could vary according to parents' gender and to parents' key working characteristics, including type of work schedule (fixed, flexible, or shift work), type of employment (full-time, part-time/occasional), and number of weekly working hours (less than 40 h, 40 h or more). Based on previous investigations, we expected to find lower levels of work-family conflict, anxiety/depression symptoms and parenting stress, and higher levels of mindful parenting among women compared to men, and among parents with a flexible work schedule, parents with a part-time job and parents who work fewer hours per week.

The second goal of this study was to investigate whether work-family conflict could play a role in parents' ability to be

mindful in the relationship with their children and whether this relationship could be mediated by parenting stress and by anxiety and depressive symptoms. To understand whether this model could be applicable to mothers and fathers and to various developmental stages of the child, we included mothers and fathers of toddlers (1–3 years), preschool and grade school children (4–11 years) and adolescents (12–19 years) in our sample, and we tested the invariance of the model with respect to the parents' gender and the children's age group. Based on previous studies showing that work-family conflict is associated with negative parenting experiences (e.g., Dinh et al., 2017), we expected that higher levels of work-family conflict could be directly associated with lower levels of mindful parenting. In addition, based on studies that demonstrated that work-family conflict is a risk factor for poor parental mental health (e.g., Cooklin et al., 2015a) and for higher levels of parenting stress (e.g., Vieira et al., 2012) and that parent mental health and parenting stress are associated with more negative parenting behaviors (e.g., Shea and Coyne, 2011), including lower levels of mindful parenting (Moreira and Canavarro, 2018b), we hypothesized that parents' anxiety and depression symptoms and parenting stress would mediate the relationship between work-family conflict and mindful parenting.

MATERIALS AND METHODS

Participants

As presented in **Table 1**, the sample comprised 335 parents (86.3% mothers) of children and adolescents aged 1–19 years. As the majority of parents had more than one child, they were asked to choose one of their children when completing the mindful parenting questionnaire. **Table 1** presents the sociodemographic characteristics of the child on whom parents focused when answering the questionnaire.

Procedure

The sample was collected online ($n = 266$, 79.4%) and in one public basic education school in the central region of Portugal ($n = 69$, 20.6%) between December 2017 and April 2018. The only inclusion criterion was to be the parent of a child or adolescent between the ages of 1 and 19 years old. Participants who were recruited online completed the questionnaires in a data collection website (LimeSurvey®). The survey link was shared on social networks and through email. In the first page of the online survey, a brief description of the study goals, the inclusion criterion, and the ethical issues that guided the study were presented. In particular, in this first page, it was clearly stated that participation in the study was anonymous and that no identifying information could be collected. Since the data was collected online, participants did not provide written informed consent. Instead, participants provided informed consent by clicking on the option "I understood and accept the conditions of the study," which was on the second page of the survey. Only those who selected this option were granted access to the assessment protocol. Parents who were recruited in the school received, through their children, a letter explaining the study,

TABLE 1 | Sociodemographic and work-related characteristics.

	N = 335
Parents' characteristics	
Parents' gender <i>n</i> (%)	
Female	289 (86.3%)
Male	46 (13.7%)
Age (years) <i>M</i> (<i>SD</i>); range	38.86 (5.59); 20–52
Parents' education <i>n</i> (%)	
Basic or secondary studies	115 (34.3%)
Higher education (bachelor's, master's or doctoral degree)	220 (65.7%)
Area of residence <i>n</i> (%)	
Rural	142 (42.4%)
Urban	193 (57.6%)
Parents' cohabitating status <i>n</i> (%)	
Living with a partner	289 (86.3%)
Not living with a partner	45 (13.4%)
Number of children	
One	139 (41.5%)
More than one	196 (58.5%)
Household monthly income <i>n</i> (%)	
<2000€	216 (64.5%)
≥2000€	119 (35.5%)
Type of employment <i>n</i> (%)	
Full-time	296 (88.4%)
Part-time	34 (10.1%)
Occasional	5 (1.5%)
Work schedule <i>n</i> (%)	
Fixed	234 (69.9%)
Flexible	47 (14%)
Shift work	54 (16.1%)
Number of working hours per week <i>M</i> (<i>SD</i>); range	38.4 (8.83); 4–80
Children's characteristics	
Child's age (years) <i>M</i> (<i>SD</i>); range	7.29 (4.43); 1–19
Child's age category <i>n</i> (%)	
Toddlers (1–3 years old)	73 (21.8%)
Preschool and grade school children (4–11 years old)	202 (60.3%)
Adolescents (12–19 years old)	60 (17.9%)
Child's gender	
Female	157 (46.9%)
Male	178 (53.1%)

an informed consent form, and the questionnaires that should be completed at home and returned a week later. Research assistants collected the written informed consents and the questionnaires at the school on a date agreed upon with the class director. Authorization for the sample collection was obtained from the Ethics Committee of the Faculty of Psychology and Education Sciences of the University of Coimbra and from the board of directors of the school.

Measures

Sociodemographic and Working Variables

Participants completed a sociodemographic form assessing their age, sex, cohabitating status, education, area of residence, family monthly income, number of children, and child's sex and age.

This form also asked parents about their type of employment (full-time, part-time, or occasional), number of working hours per week, and work schedule. The variable work schedule comprised three categories: a fixed work schedule (i.e., a schedule with the same number of working hours and days per week), a flexible work schedule (i.e., a schedule that allows employees to vary their workday start and finish times, choose the days they work, and/or work from home), and a shift work schedule (i.e., a work schedule in which most of the working hours fall outside a typical daytime Monday to Friday week and that can include evening shifts, night shifts, weekend work, irregular hours, on call, and split or rotating shifts).

Work-Family Conflict

The Portuguese version of the Work-Family Conflict (WFC) subscale of the Work-Family Conflict Scale (Haslam et al., 2015; Moreira et al., 2018a) was used to assess parents' perceived negative impacts of work on family. This subscale has 5 items (e.g., "Working often makes me irritable or short tempered at home") answered on a 7-point scale from 1 (*very strongly disagree*) to 7 (*very strongly agree*). The total score of this subscale is the sum of all items and higher scores indicate higher levels of conflict. Although the Work-Family Conflict Scale has also a Family-Work Conflict subscale, we have only included in the study the WFC subscale since we were only interested in assessing the interference of work with the family. The original version presented adequate internal consistency and convergent, concurrent and predictive validity. Preliminary data of the Portuguese version has also exhibited adequate internal consistency and construct validity. In the current study, the Cronbach's alpha was 0.89.

Anxiety and Depression Symptoms

The Portuguese version of the Hospital Anxiety and Depression Scale (HADS; Zigmond and Snaith, 1983; Pais-Ribeiro et al., 2007) was administered to parents to assess their levels of depressive and anxious symptoms in the last seven days. The scale comprises 14 items and uses a 4-point Likert scale from 0 (*not at all/only occasionally*) to 3 (*most of the time/a great deal of the time*). The items are organized into two subscales: Anxiety and Depression. The total score of each subscale is the sum of all items, with higher scores indicating higher levels of symptomatology. The HADS is frequently used for screening anxious and depressive symptomatology in clinical settings and in the general community and it has shown robust psychometric properties in a wide range of populations and cultures. The Portuguese version has also robust psychometric properties, including adequate reliability and construct validity (Pais-Ribeiro et al., 2007). In the sample of this study, the Cronbach's alpha coefficients were 0.84 for anxiety and 0.82 for depression.

Parenting Stress

To assess the distress associated with the parental role, the Portuguese version of the Parental Stress Scale (PSS; Berry and Jones, 1995; Mixão et al., 2010) was employed. The PSS has 18 items (e.g., "I feel overwhelmed by the responsibility of being

a parent”) answered on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The total score results from the sum of the items and higher scores indicate higher levels of parenting stress. The scale presented adequate psychometric properties, in the original and Portuguese versions, including adequate reliability (Cronbach’s alpha > 0.80) and construct validity in samples of parents mostly from the general community. In the current study, the Cronbach’s alpha was 0.70.

Mindful Parenting

Mindful parenting was assessed through the Portuguese version of the Interpersonal Mindfulness in Parenting Scale (IM-P; Duncan, 2007; Moreira and Canavarro, 2017). The Portuguese version (Moreira and Canavarro, 2017) includes 29 items that are scored on a 5-point Likert scale, from 1 (*never true*) to 5 (*always true*). The subscale scores result from the sum of the items, and higher scores suggest higher levels of each mindful parenting dimension. Parents were requested to think on only one of their children when answering the questionnaire, if they had more than one child. In the online data collection, parents were instructed to choose, preferably, their youngest child; in the data collection in schools, parents were instructed to think about the child who received the questionnaire in the school. IM-P items were distributed across the following subscales: (1) Listening with Full Attention (LFA; assesses the degree to which parents are attentive to their children and fully present in interactions parent–child interactions; e.g., “I pay close attention to my child when we are spending time together”), (2) Compassion for the Child (CC; assesses the extent to which parents are kind, sensitive and responsive to the child’s needs; e.g., “I try to be understanding and patient with my child when he/she is having a hard time”), (3) Non-Judgmental Acceptance of Parental Functioning (NJAPF; assesses an attitude of non-judgmental acceptance of the self as a parent; e.g., “When I do something as a parent that I regret, I try to give myself a break”), (4) Self-Regulation in Parenting (SR; assesses an ability to self-regulate emotions and behaviors during parent–child interactions; e.g., “In difficult situations with my child, I pause without immediately reacting”), and (5) Emotional Awareness of the Child (EAC; assesses the ability to notice and correctly identify the child’s emotions; e.g., “I can tell what my child is feeling even if he/she does not say anything”). Although the psychometric properties of the original version of IM-P scale are unknown, the scale has shown reliability and construct validity in Dutch samples (de Bruin et al., 2014). The Portuguese version (Moreira and Canavarro, 2017) have also exhibited reliability and construct validity among parents from the general community. In the current study, the Cronbach’s alphas were 0.85 (LFA), 0.63 (EAC), 0.81 (SR), 0.77 (NJPAF), and 0.83 (CC).

Data Analyses

The Statistical Package for the Social Sciences (SPSS, version 25.0; IBM SPSS, Chicago, IL, United States) and the AMOS 20 (IBM® SPSS® AMOS™ Version 20.0; IBM Corporation, Meadville, PA, United States) were used for data analyses. Descriptive statistics were computed for all sociodemographic and study variables. Since parents were collected through two different procedures, differences in sociodemographic and study variables between

parents who participated online and parents who were collected at the school were analyzed through ANOVAs and chi-square tests. Next, controlling for the sociodemographic variables that differed significantly between parents collected online and at the school, differences in study variables were analyzed through one-way ANCOVAs (work-family conflict and parenting stress) and MANCOVAs (anxiety/depressive symptoms and mindful parenting dimensions). To examine the bivariate associations between study variables, Pearson correlations were computed. In addition, correlations between the sociodemographic/working variables and the mindful parenting dimensions were computed with the aim of identifying potential covariates that should be controlled in the path model. Correlations close to 0.10 were considered small, close to 0.30 were considered medium, and at 0.50 or higher were considered large (Cohen, 1988).

Differences in work-family conflict, anxiety/depression symptoms, parenting stress, and mindful parenting dimensions were analyzed as a function of work schedule (fixed versus flexible versus shift work), type of employment (full-time versus part-time/occasional), and number of working hours per week (less than 40 h versus 40 h or more) through ANOVAs and MANOVAs. The part-time and occasional categories were merged into one group because only five individuals (1.5%) reported having occasional work. Because the work schedule had three categories, *post hoc* comparison analyses with a Bonferroni correction were performed to ascertain which groups differed from the others.

To examine whether work-family conflict was associated with mindful parenting dimensions through parents’ anxiety and depressive symptoms and parenting stress, a path model was tested in AMOS (maximum likelihood estimation method). The model fit was considered good when χ^2 was non-significant ($p > 0.05$), the CFI was ≥ 0.95 , the RMSEA was ≤ 0.06 , and the SRMR was ≤ 0.08 (Hu and Bentler, 1999). A bootstrap resampling procedure with 2000 samples and a 95% bias-corrected confidence interval (BC95% CI) was used to estimate the significance of the indirect effects. The specific indirect effects and their confidence intervals were estimated using an AMOS user-defined estimand. The structural invariance of the path model across children’s age groups (toddlers versus preschool and grade school children versus adolescents) and parents’ gender was tested through multigroup analyses. After examining the baseline model for each group separately, the unconstrained model (i.e., a model without equality constraints on parameters; configural invariance model) was compared with a model in which structural weights were constrained to be equal across groups. A non-significant chi-square difference ($\Delta\chi^2$) between the two models indicated that the path model was invariant across groups.

RESULTS

Preliminary Analyses

Differences in the sociodemographic and working variables between parents recruited online and parents recruited in the school were analyzed. Significant differences were only found

TABLE 2 | Correlations among study variables.

Study variables	<i>M (SD); range</i>	1	2	3	4	5	6	7	8
(1) Work-family conflict	19.24 (7.47); 5–35	–							
(2) Anxiety symptoms	6.68 (3.82); 0–19	0.26**	–						
(3) Depressive symptoms	4.88 (3.71); 0–17	0.31**	0.73**	–					
(4) Parenting stress	17.54 (2.99); 3–21	0.26**	0.47**	0.48**	–				
Mindful parenting									
(5) Listening with full attention	18.59 (2.91); 9–25	–0.34**	–0.40**	–0.40**	–0.44**	–			
(6) Emotional awareness of the child	11.70 (1.74); 7–15	–0.18**	–0.21**	–0.24**	–0.33**	0.39**	–		
(7) Self-regulation in parenting	27.05 (4.14); 14–40	–0.24**	–0.44**	–0.45**	–0.51**	0.53**	0.38**	–	
(8) Non-judgmental acceptance of parental functioning	24.30 (4.21); 13–35	–0.21**	–0.55**	–0.47**	–0.41**	0.37**	0.26**	0.49**	–
(9) Compassion for the child	25.77 (2.99); 17–30	–0.13*	–0.27**	–0.27**	–0.43**	0.50**	0.48**	0.57**	0.34**

* $p < 0.05$, ** $p < 0.01$.

for parents' gender, [$\chi^2(1) = 6.56, p = 0.010$], education [$\chi^2(1) = 8.61, p = 0.003$], and income [$\chi^2(1) = 4.50, p = 0.034$]. Controlling for these sociodemographic variables, differences between groups were analyzed for all the study variables. No significant differences were found for any study variable: work-family conflict [$F(1,330) = 0.01, p = 0.931$], parenting stress [$F(1,330) = 0.98, p = 0.323$], anxiety and depressive symptoms [Wilk's lambda = 0.998, $F(2,329) = 0.34, p = 0.715$], and mindful parenting dimensions [Wilk's lambda = 0.990, $F(5,326) = 0.68, p = 0.643$]. Therefore, the two groups were combined and analyzed together.

Correlations between study variables were also analyzed. As presented in **Table 2**, significant correlations were found between work-family conflict and all the remaining variables. Anxiety, depression and parenting stress were significantly and positively correlated with each other and significantly and negatively associated with mindful parenting dimensions. In addition, correlations between sociodemographic (parents' age, gender, education, cohabitating status, income, area of residence, number of children; children's gender and age) and working variables (work schedule, type of employment and number of working hours per week) and mindful parenting dimensions were analyzed to investigate whether any variable should be introduced as a covariate in the path model. Listening with full attention was significantly correlated with parents' gender (0 = men, 1 = women; $r = -0.12, p = 0.034$) and child's gender (0 = boy, 1 = girl; $r = -0.13, p = 0.018$); self-regulation was significantly correlated with work schedule (0 = fixed/shift work, 1 = flexible; $r = 0.12, p = 0.034$) and child's gender ($r = -0.14, p = 0.008$); non-judgmental acceptance was significantly correlated with education (0 = basic/secondary education, 1 = higher education; $r = 0.15, p = 0.006$), income (0 = 2000€, 1 = ≥ 2000 €; $r = 0.12, p = 0.023$), and work schedule ($r = 0.13, p = 0.016$); and compassion for the child was significantly correlated with child's gender ($r = -0.14, p = 0.009$).

Comparison Analyses as a Function of Working Variables

Differences in study variables as a function of work schedule (fixed versus flexible versus shift work), type of employment

(full-time versus part-time/occasional), and number of working hours per week (less than 40 versus 40 or more) are presented in **Table 3**. Significant differences in work-family conflict were found for work schedule, type of employment and number of weekly working hours. Specifically, parents with a shift work schedule presented significantly higher levels of work-family conflict than those with a fixed or flexible schedule (no differences were found between fixed and flexible schedules), and parents working full-time and 40 h or more reported higher levels of work-family conflict than those working part-time and less than 40 h per week, respectively. Significant differences in mindful parenting dimensions were found only for work schedule [Wilk's Lambda = 0.921, $F(10,656) = 2.74, p = 0.003$]. The examination of the univariate effects revealed that differences were only significant for the self-regulation in parenting and non-judgmental acceptance of parental functioning dimensions, with parents with a flexible schedule reporting significantly higher levels of self-regulation and of non-judgmental acceptance than parents with a shift work schedule (no significant differences were found between fixed and flexible or shift work schedules).

Comparison Analyses as a Function of Parents' Gender

Differences in study variables as a function of parents' gender are presented in **Table 4**. The only significant difference was found for listening with full attention, with fathers presenting higher levels of this mindful parenting dimension than mothers.

The Indirect Effect of Work-Family Conflict on Mindful Parenting Through Parental Anxiety/Depressive Symptoms and Parenting Stress

A path model was tested to explore the indirect effects of work-family conflict on mindful parenting dimensions. Sociodemographic and working variables that were significantly correlated with mindful parenting dimensions were introduced as covariates in the model. The initial path model presented a poor fit to the data, $\chi^2(60) = 641.59, p < 0.001$; CFI = 0.500; SRMR = 0.156; RMSEA = 0.170, $p < 0.001$, 90% CI = [0.16, 0.18].

TABLE 3 | Comparison analyses as a function of working variables.

	Work schedule <i>M (SD)</i>				Type of employment <i>M (SD)</i>				Weekly working hours <i>M (SD)</i>			
	Fixed <i>n</i> = 234	Shift <i>n</i> = 54	Flexible <i>n</i> = 47	Comparison analyses	Full-time <i>n</i> = 296	Part-time/ occasional <i>n</i> = 39	Comparison analyses	<40 h <i>n</i> = 141	≥40 h <i>n</i> = 194	Comparison analyses		
Work-family conflict	18.50 (7.35)	23.78 (7.25)	17.72 (6.47)	<i>F</i> (2,332) = 12.96, <i>p</i> < 0.001	19.74 (7.24)	15.41 (8.15)	<i>F</i> (1,333) = 11.98, <i>p</i> < 0.001	17.55 (7.48)	20.47 (7.24)	<i>F</i> (1,332) = 12.95, <i>p</i> < 0.001		
Anxiety	6.71 (3.68)	6.78 (4.39)	6.23 (3.94)	<i>F</i> (2,332) = 0.13, <i>p</i> = 0.978	6.64 (3.78)	7.00 (4.14)	<i>F</i> (1,333) = 0.30, <i>p</i> = 0.583	6.87 (3.87)	6.55 (3.79)	<i>F</i> (1,332) = 0.59, <i>p</i> = 0.442		
Depression	4.81 (3.63)	5.52 (3.97)	4.51 (3.81)	<i>F</i> (2,332) = 1.08, <i>p</i> = 0.342	4.81 (3.60)	5.44 (4.48)	<i>F</i> (1,333) = 0.99, <i>p</i> = 0.321	5.12 (3.88)	4.71 (3.58)	<i>F</i> (1,332) = 1.02, <i>p</i> = 0.314		
Parenting stress	39.18 (6.45)	37.98 (6.33)	37.66 (5.35)	<i>F</i> (2,332) = 1.66, <i>p</i> = 0.191	38.83 (6.24)	38.38 (6.30)	<i>F</i> (1,333) = 0.17, <i>p</i> = 0.681	38.83 (6.74)	38.73 (5.99)	<i>F</i> (1,332) = 0.18, <i>p</i> = 0.895		
MP: Listening with full attention	18.74 (3.01)	17.93 (3.00)	18.62 (2.19)	<i>F</i> (2,332) = 1.72, <i>p</i> = 0.181	18.61 (2.96)	18.46 (2.57)	<i>F</i> (1,333) = 0.09, <i>p</i> = 0.768	18.55 (2.87)	18.63 (2.95)	<i>F</i> (1,333) = 0.06, <i>p</i> = 0.810		
MP: Emotional awareness of the child	11.76 (1.70)	11.78 (1.84)	11.32 (1.78)	<i>F</i> (2,332) = 1.35, <i>p</i> = 0.260	11.66 (1.74)	12.03 (1.72)	<i>F</i> (1,333) = 1.51, <i>p</i> = 0.219	11.74 (1.74)	11.68 (1.73)	<i>F</i> (1,333) = 0.13, <i>p</i> = 0.718		
MP: Self-regulation in parenting	27.09 (4.26)	25.83 (3.76)	28.23 (3.56)	<i>F</i> (2,332) = 4.36, <i>p</i> = 0.014	27.00 (4.09)	27.41 (4.49)	<i>F</i> (1,333) = 0.34, <i>p</i> = 0.561	26.82 (4.28)	27.22 (4.04)	<i>F</i> (1,333) = 0.77, <i>p</i> = 0.382		
MP: Non-judgmental acceptance of parental functioning	24.18 (4.19)	23.63 (4.24)	25.66 (4.07)	<i>F</i> (2,332) = 3.29, <i>p</i> = 0.039	24.27 (4.20)	24.46 (4.33)	<i>F</i> (1,333) = 0.07, <i>p</i> = 0.794	24.13 (3.93)	24.42 (4.41)	<i>F</i> (1,333) = 0.39, <i>p</i> = 0.534		
MP: Compassion for the child	25.67 (3.03)	25.93 (3.08)	26.06 (2.70)	<i>F</i> (2,332) = 0.43, <i>p</i> = 0.653	25.73 (2.98)	26.03 (3.13)	<i>F</i> (1,333) = 0.33, <i>p</i> = 0.567	25.77 (2.90)	25.76 (3.07)	<i>F</i> (1,333) = 0.00, <i>p</i> = 0.976		

MP, mindful parenting. Significant differences are marked as bold.

TABLE 4 | Comparison analyses as a function of parents' gender.

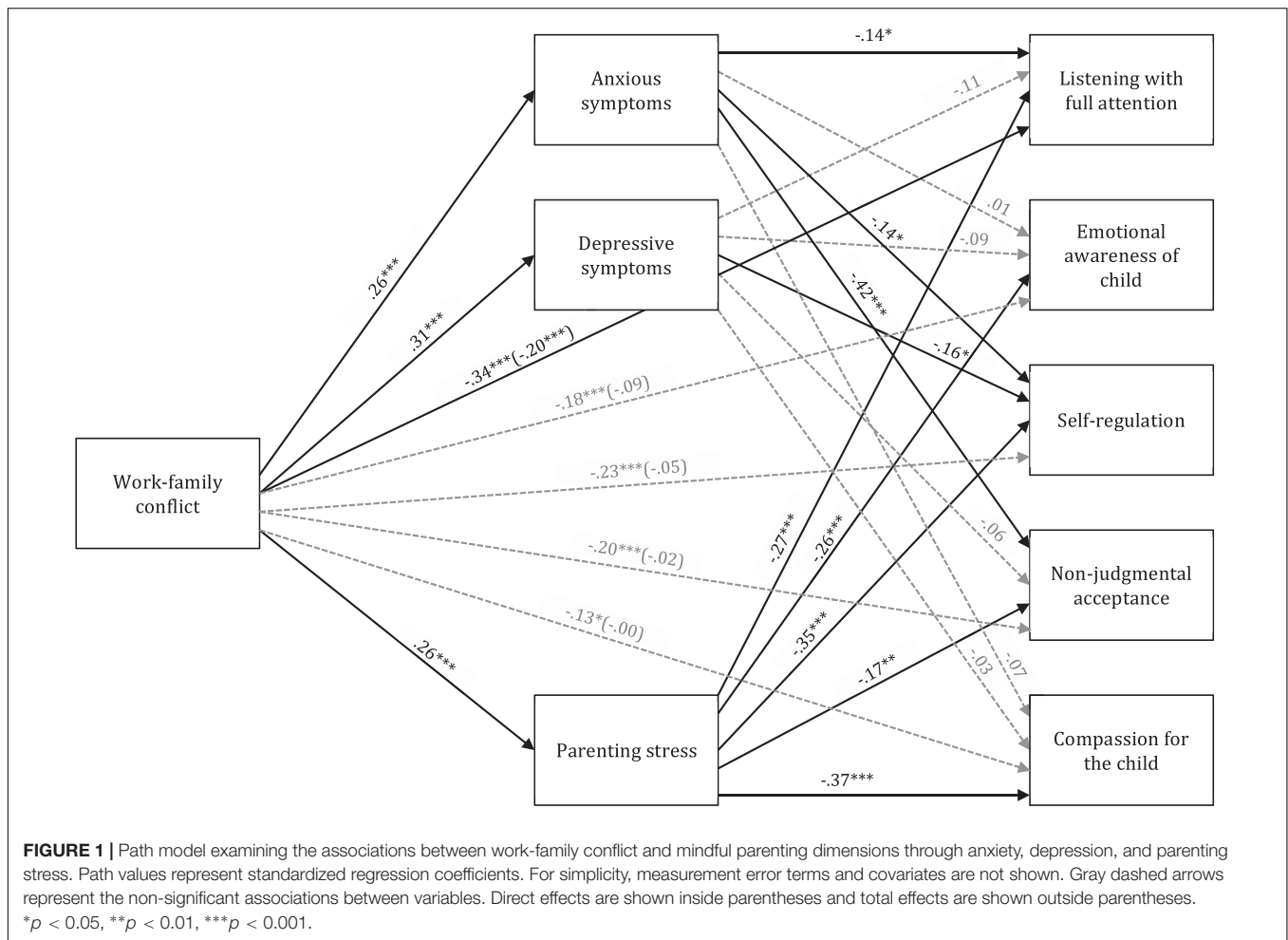
	Mothers (<i>n</i> = 289)	Fathers (<i>n</i> = 49)	Comparison analyses
	<i>M (SD)</i>	<i>M (SD)</i>	
Work-family conflict	18.50 (7.35)	17.72 (6.47)	<i>F</i> (1,333) = 1.91, <i>p</i> = 0.168
Anxiety	6.75 (3.85)	6.24 (3.66)	<i>F</i> (1,333) = 0.72, <i>p</i> = 0.397
Depression	4.93 (3.77)	4.59 (3.38)	<i>F</i> (1,333) = 0.33, <i>p</i> = 0.564
Parenting stress	38.81 (6.48)	38.57 (5.11)	<i>F</i> (1,333) = 0.06, <i>p</i> = 0.807
Mindful parenting			
Listening with full attention	18.46 (2.98)	19.43 (2.34)	<i>F</i> (1,333) = 4.52, <i>p</i> = 0.034
Emotional awareness of the child	11.75 (1.72)	11.39 (1.83)	<i>F</i> (1,333) = 1.74, <i>p</i> = 0.188
Self-regulation in parenting	27.54 (3.46)	26.97 (4.23)	<i>F</i> (1,333) = 0.77, <i>p</i> = 0.382
Non-judgmental acceptance of parental functioning	24.20 (4.17)	24.91 (4.42)	<i>F</i> (1,333) = 1.15, <i>p</i> = 0.285
Compassion for the child	25.73 (3.05)	25.98 (2.64)	<i>F</i> (1,333) = 0.27, <i>p</i> = 0.607

Therefore, we examined the modification indices, which suggested that some residuals might be correlated. We initially allowed the correlation between the residuals belonging to depression, anxiety and parenting stress and between income and education, which presented the largest modification indices. Although the model fit improved significantly [$\Delta\chi^2(4) = 349.13, p < 0.001$], it did not achieve a good fit ($\chi^2(56) = 292.46, p < 0.001$; CFI = 0.797; SRMR = 0.089; RMSEA = 0.112, $p < 0.001, 90\% CI = [0.10, 0.13]$). Therefore, some residuals from mindful parenting dimensions were also allowed to correlate (listening with full attention with emotional awareness, self-regulation, and compassion for the child; emotional awareness with self-regulation and compassion for the child; self-regulation with non-judgmental acceptance and compassion for the child). The respecified path model presented a very good fit to the data, $\chi^2(49) = 83.46, p = 0.002$; CFI = 0.970; SRMR = 0.060; RMSEA = 0.046, $p = 0.638, 90\% CI = [0.03, 0.06]$ (see Figure 1).

As presented in Table 5, work-family conflict had an indirect effect on all mindful parenting dimensions through depressive and anxiety symptoms and parenting stress. When analyzing the specific indirect effects, we found that work-family conflict was associated with listening with full attention through anxiety and parenting stress; with emotional awareness of the child through parenting stress; with self-regulation through anxiety, depression and parenting stress; with non-judgmental acceptance through anxiety and parenting stress; and with compassion for the child only through parenting stress.

Structural Invariance Across Children's Ages and Parents' Gender

Multigroup analyses were performed to test the structural invariance of the path model across children's age groups (toddlers versus preschool and grade school children versus adolescents) and parents' gender. Concerning the invariance analyses for children's age groups, the baseline model



demonstrated a good fit to the data in the group of parents of preschool and grade school children, $\chi^2(49) = 69.98, p = 0.016$; CFI = 0.971; SRMR = 0.068; RMSEA = 0.046, $p = 0.581$; 90% CI = [0.02, 0.07]. Among parents of toddlers and adolescents, the model presented a poorer fit to the data (toddlers: $\chi^2(49) = 64.06, p = 0.073$; CFI = 0.948; SRMR = 0.100; RMSEA = 0.065, $p = 0.279$; 90% CI = [0.00, 0.11]; adolescents: $\chi^2(49) = 73.28, p = 0.014$; CFI = 0.865; SRMR = 0.112; RMSEA = 0.092, $p = 0.074$; 90% CI = [0.04, 0.13]). Then, we compared the unconstrained and constrained models (unconstrained: $\chi^2(147) = 207.92, p < 0.001$; CFI = 0.949; SRMR = 0.101; RMSEA = 0.035, $p = 0.990$; 90% CI = [0.02, 0.05]; constrained: $\chi^2(209) = 269.11, p = 0.003$; CFI = 0.950; SRMR = 0.107; RMSEA = 0.029, $p = 1.00$; 90% CI = [0.02, 0.04]) and found that the difference between both models was not significant, $\Delta\chi^2(62) = 61.19, p = 0.505$, which indicates that the relationships between the variables in the model were invariant across groups.

To explore if the path model was invariant across mothers and fathers, another multigroup analysis was performed. In this analysis, parents' gender was not introduced as a covariate. The baseline model for mothers demonstrated a good fit to the data ($\chi^2(37) = 51.47, p = 0.057$; CFI = 0.986; SRMR = 0.058; RMSEA = 0.037, $p = 0.815$; 90% CI = [0.00, 0.06]); however,

the model did not present a good fit in the group of fathers ($\chi^2(37) = 67.59, p = 0.002$; CFI = 0.815; SRMR = 0.131; RMSEA = 0.136, $p = 0.008$; 90% CI = [0.08, 0.19]). The comparison between the unconstrained and the constrained models (unconstrained: $\chi^2(74) = 120.02, p < 0.001$; CFI = 0.961; SRMR = 0.131; RMSEA = 0.043, $p = 0.779$, 90% CI = [0.03, 0.06]; constrained: $\chi^2(104) = 146.86, p = 0.004$; CFI = 0.964; SRMR = 0.143; RMSEA = 0.035, $p = 0.975$, 90% CI = [0.02, 0.05]) revealed a non-significant difference, $\Delta\chi^2(30) = 26.84, p = 0.632$, which indicates that the relationships between variables in the model were invariant across groups.

DISCUSSION

This study had two main goals. First, we aimed to investigate whether some important work-related variables, such as type of employment, work schedule and number of working hours per week, could play a role in parents' work-family conflict and also on their emotional distress (anxiety/depression symptoms, parenting stress) and parenting practices (i.e., mindful parenting). We found that parents with a shift work schedule, parents with a full-time job, and parents who work 40 h

TABLE 5 | Indirect effects of work-family conflict on mindful parenting dimensions.

	Estimate	p-value	BC 95%CI
			Lower/Upper
Indirect effects			
WFC → LFA	-0.140	0.001	-0.205/-0.082
WFC → EAC	-0.096	0.001	-0.151/-0.048
WFC → SR	-0.179	0.001	-0.253/-0.114
WFC → NJAPF	-0.173	0.001	-0.246/-0.109
WFC → CC	-0.127	0.001	-0.198/-0.069
Specific indirect effects			
WFC → Depression → LFA	-0.014	0.127	-0.036/0.003
WFC → Depression → EAC	-0.007	0.287	-0.022/0.006
WFC → Depression → SR	-0.027	0.012	-0.057/-0.006
WFC → Depression → NJAPF	-0.011	0.382	-0.037/0.015
WFC → Depression → CC	-0.004	0.661	-0.027/0.016
WFC → Anxiety → LFA	-0.014	0.038	-0.036/-0.001
WFC → Anxiety → EAC	0.001	0.940	-0.010/0.010
WFC → Anxiety → SR	-0.021	0.030	-0.047/-0.002
WFC → Anxiety → NJAPF	-0.062	0.001	-0.095/-0.034
WFC → Anxiety → CC	-0.008	0.290	-0.027/0.007
WFC → Parenting Stress → LFA	-0.027	0.001	-0.045/-0.013
WFC → Parenting Stress → EAC	-0.016	0.001	-0.027/-0.008
WFC → Parenting Stress → SR	-0.050	0.001	-0.077/-0.028
WFC → Parenting Stress → NJAPF	-0.024	0.002	-0.044/-0.009
WFC → Parenting Stress → CC	-0.039	0.001	-0.060/-0.021

WFC, work-family conflict; LFA, listening with full attention; EAC, emotional awareness of the child; SR, self-regulation in parenting; NJAPF, non-judgmental acceptance of parental functioning; CC, compassion for the child. Standardized coefficients are presented for the global indirect effects and unstandardized coefficients are presented for the specific indirect effects.

or more per week had higher levels of work-family conflict than parents with a flexible or fixed work schedule, parents with a part-time job and parents who work less than 40 h per week, respectively. We also found that parents with a flexible work schedule had higher levels of self-regulation in parenting and higher levels of non-judgmental acceptance of parental functioning than parents with a fixed or shift work schedule. Another major goal of this study was to investigate whether work-family conflict was linked to mindful parenting dimensions through parental psychopathology and parenting stress. Overall, we found that higher levels of work-family conflict were indirectly associated with lower levels of mindful parenting dimensions through anxiety and depression symptoms and parenting stress. This model was shown to be invariant between mothers and fathers and between parents of children from different age groups. These results will be discussed in further detail below.

Corroborating the results of previous studies (e.g., McLoyd et al., 2008; Cho, 2018), we found that parents working full-time and 40 h or more per week and with a shiftwork schedule reported higher levels of work-family conflict. Parents working full-time and more than 40 h per week have objectively less time for their family, which can lead them to experience greater difficulty in successfully managing family and work roles. Parents working

fewer hours and part-time have more time and, consequently, more opportunities to be with their family, which seems to be a key factor for experiencing lower levels of work-family conflict. In addition, parents with a shift work schedule usually work on weekends, work evening and night shifts, and have irregular or rotating shifts. This type of work schedule, often called “unsociable work” (Strazdins et al., 2006), may be highly disruptive for family routines (McLoyd et al., 2008) and may lead parents to experience a greater instability and a lower perception of control over their lives and to have less time and energy resources for performing their family role, which may result in a greater perception that work demands are negatively interfering with their family demands (Cho, 2018).

The results of our study also suggest that flexible work schedules can be protective of parenting. These findings are in line with those of previous investigations that found that working time flexibility can facilitate the work-life balance of employees and, particularly, of parents (Riedmann et al., 2006; OECD, 2011; Eurofound, 2016). Interestingly, in a study that included a large sample of working parents of children aged 0–16 from the United Kingdom (Bowden, 2009), 51% of the working parents reported that they would have a better relationship with their children if they had a flexible work schedule; and 63% of the parents working full-time reported that their current work schedule prevent them from being with their children the amount of time they would like. However, to the best of our knowledge, our study is the first study directly exploring the role of flexible working hours on parenting behaviors. Specifically, we found that parents with flexible schedules presented higher levels of self-regulation in parenting and of non-judgmental acceptance of parental functioning than parents with fixed or shiftwork schedules. Having flexible working hours allows parents to better reconcile work demands and tasks with their family role (e.g., parents can change their workday start and finish times in order to do some activity with their children or work from home if their child is sick) (OECD, 2016). This greater balance may lead parents to feel less stressed and better able to regulate their emotions and behaviors when interacting with their children (e.g., as suggested by their higher levels of self-regulation in parenting, they may have a greater ability to pause before reacting to a child's negative behaviors, instead of automatically displaying hostility or negative affect), which in turn may have a positive impact on the relationship with their children. In addition, being able to manage working hours allows parents to avoid missing important moments in their children's lives (e.g., school parties and sport events), to be present when necessary (e.g., when children are sick), and to involve themselves in a greater number of leisure activities with their children. This can make parents less likely to feel that they have failed as parents, which can lead them to have higher levels of non-judgmental acceptance of their parental functioning. Parents who work in shifts or who have a fixed work schedule are less able to manage their time according to their child's needs (Barnett et al., 2008), which may lead them to feel guilty for not being present whenever necessary and to criticize themselves as parents.

We also analyzed gender differences in study variables. No differences were found in any variable, with the exception of

the mindful parenting dimension listening with full attention. While it is important to keep in mind that our study comprised a very small number of fathers (13.7% of the total sample) and that our group of fathers was a self-selected sample (most fathers were recruited online; therefore, these fathers are likely those who are more involved in childcare and who are more interested in parenting-related issues), our results suggest that the mothers and fathers in our sample experience similar levels of work-family conflict, anxiety/depression symptomatology, and parenting stress. In the majority of contemporary families, both parents work outside the home and both take an active role in caring for their children. In fact, according to the OECD data on gender equality, although Portuguese women are less likely to be employed than men, the gender gap is smaller than the OECD mean (10.8% points). Specifically, in 2017, in Portugal, the female employment rate (64.8%) was only 6.3% points lower than the average employment rate for men (71.1%) (OECD, 2019). However, even though men and women are expected to take equal roles in the family and working contexts, the traditional gender-role stereotypes are still prevalent, particularly in dual-earner families with children (Endendijk et al., 2018). While women are expected to succeed at work, they are also expected to assume the most prominent role in childcare, and while men are still expected to be the main economic providers, many also want to have an active role in their families (which may particularly be the case for the fathers who constituted our sample). Thus, it is not surprising that both report similar levels of work-family conflict and emotional distress.

With regard to gender differences in mindful parenting, it is interesting to note that in our sample, fathers reported higher levels of listening with full attention than mothers, a dimension that refers to the parents' ability to direct their attention and awareness to the child and be fully present during parent-child interactions. A possible explanation is that mothers, because they still assume the most salient roles in the childcare and at home and spend more time than fathers with their children (Laflamme et al., 2002), may feel a greater difficulty in balancing all the tasks and roles as mothers, homemakers, workers, among others, which may have a negative impact on their ability to be in the present moment with their children. Although they seem to not perceive a higher level of work-family conflict than fathers, they may be more concerned with endless outstanding tasks (in the different contexts in which they play a role), and these constant concerns and role demands may deprive them of the ability to direct their full attention to their children when interacting with them. A typical example would be a mother who is thinking about what she is going to do for dinner and about the chores left to do at her job while playing with her child. In fact, extensive research shows that fathers tend to spend a greater amount of their interaction time with their children in play activities, whereas mothers usually spend more time in caregiving activities (McBride and Mills, 1993; Tiedje and Darling-Fisher, 1993). Play activities are likely to involve more attention to the present moment than caregiving activities, such as feeding the child or helping to do homework, which can also explain our results. Lastly, women are known

to be more ruminative than men (Johnson and Whisman, 2013), which can also explain our results. Whereas men can more easily turn off their preoccupations and enjoy the present moment while interacting with their children, women may more easily engage in ruminative thoughts that divert their attention from what is going on in the present moment when they are with their children.

With regard to the path model, we found that, although work-family conflict was indirectly associated with all mindful parenting dimensions through anxiety, depression, and/or parenting stress, it only had a direct effect on the listening with full attention dimension. This direct effect suggests that perceiving a greater level of interference of work with family life (particularly with regard to less quality time with the family and increased irritability at home, which are the main aspects assessed by the work-family conflict measure we used in this study) can translate into a diminished ability to listen to the child and engage in activities together in a calm and attentive way. Objectively, those who have fewer opportunities to be with their family because of work also have fewer opportunities to bring their mindful awareness to interactions with their children. In addition, we may hypothesize that parents with higher levels of work-family conflict may be absorbed by work-related concerns or by ruminations related to the frustration they feel at having so little time for the family, which may consume their attention resources and leave them with a diminished ability to concentrate on the present when they are with their children. For example, if parents are worried about a deadline, an outstanding task, or any other work-related issue, or if parents are focused on the fact that they usually have little time to be with their children ("I should have more time for my family"), they may be so consumed by those thoughts and concerns that they may not be able to be fully present and focus entirely on what is going on when they are interacting with their children (e.g., playing, feeding them).

As mentioned, we found several indirect effects between work-family conflict and mindful parenting through anxiety, depression, and/or parenting stress. These indirect effects occurred through positive associations between work-family conflict and the three mediators and negative associations between the mediators and the mindful parenting dimensions. With regard to the positive associations between work-family conflict and anxiety, depression, and parenting stress, these results are in accordance with previous investigations that have shown that work-family conflict is an important risk factor for parental psychopathology and parenting stress (e.g., Vieira et al., 2012; Westrupp et al., 2016). Managing family and work roles and feeling that the demands of time and energy these roles require are not easily reconcilable can be profoundly exhausting and distressing for parents and make them feel anxious, depressed, and highly stressful in their parental roles. Parents may feel that to respond satisfactorily to the demands of their jobs, they fail as parents, which may undermine their psychological well-being and lead them to feel that the demands of being a parent exceed their personal and social resources (e.g., parenting skills, social support) to cope with those demands (Abidin, 1992).

With regard to the links between the mediators (anxiety, depression, and parenting stress) and the mindful parenting dimensions, we found that while parenting stress was negatively associated with all mindful parenting dimensions (i.e., dimensions related to the parents, the child, and the parenting relationship), anxiety and depression were predominantly associated with parent-centered dimensions. Specifically, anxiety was negatively associated with self-regulation, non-judgmental acceptance of the parenting functioning and listening with full attention, and depression was only negatively associated with self-regulation. These findings suggest that individual factors, such as psychopathology, seem to play a more relevant role on mindful parental behaviors that are more focused on the parent themselves (the ability to listen with full attention, to regulate emotions and behaviors in parent-child interactions and to non-judgmentally accept parental mistakes and limitations), whereas parenting stress seem to have a broader effect and to also play a role in dimensions more focused on the child, such as the emotional awareness of child and the compassion for the child.

With regard to parenting stress, several previous studies have already shown a consistent association between this type of stress and mindful parenting (e.g., Bögels et al., 2014; Gouveia et al., 2016; Moreira and Canavarro, 2018b). While previous research has typically explored this link in the opposite direction to that we investigated in this study, suggesting that mindful parenting may create favorable conditions for parents to experience lower levels of parenting stress, the opposite direction is also valid. Several theories of parenting stress argue that this type of stress leads to dysfunctional parenting (Abidin, 1992; Deater-Deckard, 2004), which is consistent with the results of our study that suggest that parents who are more stressed due to the demands and challenges of their parenting roles may struggle to adopt a mindful stance in parenting. Perceiving parental demands (e.g., survival demands such as feeding and protection and psychological demands such as giving affection to the child and helping the child regulate emotions) as exceeding parental resources (e.g., feelings of competence, time, instrumental, and emotional support) may lead parents to experience parenting as more stressful and taxing than rewarding, which is not the ideal condition for mindful parenting. This study adds to the existing knowledge by showing that experiencing work-related stress can spill over to the parenting context, leading parents to experience higher levels of parenting stress and, in turn, less mindful parenting.

Our model also suggests that parents' anxiety and depression symptoms also play a role, albeit a less prominent role than parenting stress, in explaining why work-family conflict is associated with lower levels of mindful parenting. Several specific indirect effects were found, which corroborate the large body of research indicating that parental psychopathology suffers the influence of work-related variables (Westrupp et al., 2016) and is one of the most influential determinants of maladaptive parenting practices (Belsky, 1984; Harvey et al., 2011). We found that both depression and anxiety were associated with lower levels of self-regulation in parenting. Anxious and depressed individuals tend to have greater difficulties in regulating their

own emotions (Gross and Jazaieri, 2014), and this difficulty may extend to the parent-child relationship. In fact, our results suggest that more anxious and/or depressed parents may have greater difficulty in regulating their emotions and behaviors when interacting with their children and a greater predisposition to be more impulsive and reactive to children's (negative) behaviors. These results are consistent with previous studies showing, for instance, that parental depression increases parents' child-directed hostility and negativity (Lovejoy et al., 2000; Harvey et al., 2011), which often is the result of a lower ability to regulate their own negative emotions.

In addition, we found that higher levels of anxiety were a mediator of the relationship between work-family conflict and listening with full attention. This result corroborate previous studies showing, for instance, that anxious parents tend to be less engaged and more withdrawn during interactions with their children (Woodruff-Borden et al., 2002), to have lower levels of sensitivity when interacting with their children (Nicol-Harper et al., 2007), and to be less warm (Whaley et al., 1999; Williams et al., 2012) than non-anxious parents. Several explanations may underlie our results. First, anxious parents may focus their attention primarily on themselves and on their own needs, as suggested by previous studies that have shown that parental psychopathology promotes self-focused attention, particularly on their own symptoms and needs (Ingram, 1990; Dix and Meunier, 2009). By focusing their attention on themselves and on their own symptoms of anxiety, anxious parents are less likely to direct their attention to their child, as suggested by the negative link between anxiety and listening with full attention. Second, anxious mothers might be more ruminative and, consequently, less able to be mindful in the interactions with their children. This hypothesis is consistent with previous research showing that parental rumination has a negative effect on parent-child interactions and relationship outcomes (e.g., Stein et al., 2012; O'Mahen et al., 2015), as well as with previous studies showing that rumination and mindfulness are negatively associated (e.g., Teasdale et al., 1995; Schut and Boelen, 2017). Rumination, which is highly prevalent among individuals with anxiety disorders (Dar and Iqbal, 2015), may monopolize attentional and cognitive resources and narrow parents' attentional focus, thereby making it difficult for mothers to fully engage with their children and to be fully present when interacting with them (Stein et al., 2012; Moreira and Canavarro, 2018b). Since we found that work-family conflict was linked to anxiety and, consequently, to the ability to listen to the child with full attention, it can be hypothesized that these ruminative thoughts are linked to work-related features. Future studies should further investigate this possibility by using a measure that evaluates rumination that is particularly focused on work-related issues.

Anxiety symptoms also mediated the link between work-family conflict and non-judgmental acceptance of parental functioning. These associations are consistent with previous research that has shown that distressed mothers are usually more self-critical and, consequently, are more likely to endorse a negative view of themselves as mothers (Goodman and Gotlib, 1999). Self-criticism is a transdiagnostic factor that is linked to several forms of psychopathology (Blatt and Zuroff, 1992;

Gilbert and Procter, 2006). Therefore, it is likely that more anxious parents (as well as parents showing higher levels of parenting stress) might find it difficult to accept perceived limitations as parents and feel that they do not meet their self-defined standards in the relationship with their children, particularly if they experience a higher level of work-family conflict, as suggested by the results of this study.

The invariance analyses revealed that the relationships in the model were independent of the parents' gender and of the child's developmental stage. With regard to parents' gender, and although men and women struggle with different gender-role stereotypes, work-family conflict seems to play an identical role in mothers' and fathers' emotional distress and in their parenting practices. Given the large number of dual-earner families in today's society, it is possible that, in some cases, both parents may have high levels of work-family conflict, which may have a cumulative effect on the risk of less mindful parenting practices. Furthermore, although the developmental challenges are different in young children, school-aged children and adolescents (e.g., Teasdale et al., 1995; Schut and Boelen, 2017), the effect of work-family conflict on parental distress and, in turn, on mindful parenting seems to be transversal to the different developmental stages. However, it is important to note that the baseline model for the parents of toddlers and adolescents and for fathers did not present a very good fit to the data. While this may mean that the path model does not fit these groups well, these results may also be a consequence of the reduced size of these subsamples. Future studies should seek to include the same number of parents of children of different ages and the same number of mothers and fathers.

Limitations of the Study

This study presents several limitations that should be noted. First, this study has a cross-sectional design, which does not allow for determining with confidence the direction of the associations between the variables. For instance, it is also possible that experiencing higher levels of psychopathology symptoms and parenting stress leads to a greater strain between work and family demands. On the other hand, mindful parenting can also predict parenting stress and even work-family conflict. For instance, more mindful parents may be more able to positively manage the challenges and demands of parenting, consequently feeling less parenting stress. Mindful parents might also manage in a more balanced way the demands of work and family, feeling less conflict between these two roles. Future longitudinal studies should be conducted to understand the direction of the associations between these variables. In addition, and although we have considered psychopathology symptoms and parenting stress as parallel mediators, future longitudinal studies, in which all variables are assessed through several time points, may contribute to clarify the directionality between these variables. Second, 86.3% of the participants were mothers, which limits the generalizability of the results to fathers. Future studies should include a larger number of fathers to explore in further detail gender effects on the associations studied. Third, most parents were married or living with a partner, had completed higher

education, had a child between the ages of 3 and 10 years old, and had a full-time job and a fixed work schedule, which may limit the generalization of results to parents with other sociodemographic characteristics, with younger or older children (i.e., toddlers and adolescents) and with other work conditions. Fourth, the sample was recruited online and at schools. Although no differences were found in study variables as a function of the local of recruitment, the two groups differed in some sociodemographic variables. In addition, online recruitment is often associated with a self-selection bias (i.e., parents who participate in an online study tend to be more interested in the study theme and to be more motivated to complete the questionnaires), which may compromise the representativeness of the sample. Fifth, the Cronbach's alpha of the Emotional Awareness of the Child subscale was below the recommended threshold of 0.70. Although some authors argue that Cronbach's alphas of 0.60 are acceptable in research in the social sciences (Galinsky, 1987), some caution should be used when interpreting the results obtained with this subscale. Finally, to improve the model fit of the path model, we have allowed some residuals of the study variables to correlate. However, this was made not only based in statistical criteria but also based on a theoretical rationale (e.g., it is expectable that the associations between anxiety and depression symptoms were high, so we allowed the residuals to be correlated, which suggests that other factors not included in the model may influence both anxiety and depression symptoms).

Practical Implications of the Study

The results of the present study provide further evidence that certain working conditions (e.g., shiftwork) and work-family conflict may have an adverse impact on the lives of employed parents, particularly on their mental health and parental behaviors. It is critically important that policy makers and employers recognize this impact and devise strategies that can help parents better balance their work and family responsibilities. With the growing rates of dual-earner families, it is increasingly important that workplaces adopt and implement family-friendly policies that can minimize the impact of work on family, such as more extended maternity and paternity leaves (in Portugal, the maternity leave has a maximum of 6 months and the paternity leave is 25 days), sickness leaves, career breaks and extended leave, part-time work, and flexible work arrangements (e.g., alternate work schedule, teleworking, compressed work week) (Aron et al., 2013; Hair et al., 2013). The results of our study emphasize the protective role of a flexible work schedule and the detrimental role of a shiftwork schedule on parent's wellbeing and parenting. Family-friendly policies can help working parents have a more balanced life, which may benefit not only the parents themselves but also their children, their families, and even their organizations. For instance, several studies have demonstrated that family-friendly policies promote a greater commitment to work and higher levels of job satisfaction (Yu, 2018), greater productivity (Dex and Smith, 2002; Bae and Yang, 2017) and fewer turnover intentions (Bae and Yang, 2017).

In addition, our study suggests that work-family conflict plays a detrimental role on parents' mental health and parenting

practices at different stages of child development, particularly during preschool and grade school years. Although most family support policies in Portugal are designed for parents in the postpartum period (e.g., maternity leave and breastfeeding breaks), our study draws attention to the importance of supporting parents in the later stages of child development. Therefore, family-friendly work arrangements should include parents of children and adolescents of all ages and should not be exclusive of parents during the postpartum period.

When it is not possible to change work conditions (e.g., to change from a shiftwork schedule to a flexible schedule) and/or when workplaces are not willing to implement family-friendly policies, targeted interventions for parents who are experiencing high levels of stress and difficulty in reconciling work and family demands, aimed at helping them develop strategies to better cope with the work-family conflict, can be very useful. In addition, preventive parenting interventions designed to promote more positive and mindful parenting practices, regardless of parents' work conditions, should consider the impact that work can have on parents' mental health and parenting and, therefore, help them to develop skills that allow them to more adaptively balance work and family responsibilities (e.g., time management skills) in order to prevent them from experiencing high levels of conflict between their work and family roles.

Another result of our study with important implications is that anxiety, rather than depression, seems to play an important role in how parents see themselves as parents and in their ability to be fully present when interacting with their children. These findings underline the importance of assessing, in clinical context, the relationship that anxious parents establish with their children, in order to provide them strategies that not only reduce their anxiety but also promote a greater acceptance of perceived mistakes and limitations as parents, a greater self-regulation in parenting, and a greater ability to defuse from their problems and to be present when interacting with their children. Although the literature has predominantly emphasized the negative role that parental depression plays in parenting behaviors and in child development (Yu, 2018), our study draws attention to the important role of anxious symptomatology. In addition, parenting stress has been shown to be the mediator that best explains the relationship between work-family conflict and mindful parenting, since it has been shown to be associated with all the dimensions of this parenting style. It seems to be parenting stress that has a greater impact on mindful parenting behaviors, particularly on child-centered dimensions (which were not associated with psychopathology). These results underscore the importance and utility of mindfulness focused parental interventions for parents with high levels of parenting stress (Lovejoy et al., 2000), particular for those whose the likely cause of stress is a conflict between work and family demands. These results also point out that a more general preventive approach targeting the promotion of mental health in work contexts may expand its benefits not only at the individual level, but also to the parent-child relationship.

Promoting mindful parenting, namely, by creating better working conditions so that parents can effectively *be* mindful in the relationship with their children, is extraordinarily important

not only for parents but also for children. Mindful parenting can be a privileged vehicle to foster a positive and secure relationship between the parents and the children (Bögels and Restifo, 2014), and in several studies, it has been shown to promote better psychosocial adjustment in various groups of children and adolescents (e.g., less internalizing and externalizing behaviors, greater wellbeing) (Medeiros et al., 2016; Moreira et al., 2018b). Therefore, the promotion and implementation of work policies that protect the family, by reducing work-family conflict and thus preventing the development of psychopathology and parental stress and promoting a mindful stance in parenting, are fundamental for future generations. Parents who are happier in their different work and family roles are also parents who are more balanced and mindful in the relationship with their children.

DATA AVAILABILITY

The datasets generated for this study are available on request to the corresponding author.

ETHICS STATEMENT

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The Ethics Committee of the Faculty of Psychology and Education Sciences of the University of Coimbra approved the study. Informed consent was obtained from all participants included in the study. Participants recruited through a data collection website provided informed consent by clicking on the option "I understood and accept the conditions of the study." Participants recruited at the school provided written informed consent.

AUTHOR CONTRIBUTIONS

HM designed the study, performed the data analyses, and wrote the manuscript. AF designed the study and revised the final draft of the manuscript. BC contributed to the interpretation of data. MC collaborated in the editing of the final manuscript.

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Is Mindful Parenting Associated With Adolescents' Emotional Eating? The Mediating Role of Adolescents' Self-Compassion and Body Shame

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This study aimed to explore whether parents' mindful parenting skills were associated with adolescents' emotional eating through adolescents' levels of self-compassion and body shame. The sample included 572 dyads composed of a mother or a father and his/her child (12–18 years old), with normal weight (BMI = 5–85th percentile) or with overweight/obesity with or without nutritional treatment (BMI \geq 85th percentile) according to the WHO Child Growth Standards. Parents completed self-report measures of mindful parenting (Interpersonal Mindfulness in Parenting Scale), and adolescents completed measures of self-compassion (Self-Compassion Scale-Short Form), body shame (Experience of Shame Scale), and emotional eating (Dutch Eating Behavior Questionnaire). Two path models, one with the total score for mindful parenting and the other with its dimensions, were tested in AMOS. Mindful parenting, specifically the dimension of compassion for the child, was indirectly associated with emotional eating through adolescents' self-compassion (point estimate = -0.27 , $p = 0.03$, CI 95% [-0.61 , -0.06]) and through self-compassion and body shame sequentially (point estimate = -0.19 , $p = 0.03$, CI 95% [-0.37 , -0.05]). The path model was invariant across weight groups but not across adolescents' sex (the indirect effects were significant among girls only). This study provides a novel comprehensive model of how mindful parenting, especially the dimension of compassion for the child, can be associated with adolescents' emotional eating behaviors by suggesting a potential sequence of mechanisms that may explain this association. This study suggests the beneficial effect of both mindful parenting and adolescents' self-compassion skills for adolescent girls struggling with feelings of body shame and emotional eating behaviors.

Keywords: mindful parenting, self-compassion, body shame, emotional eating, weight

INTRODUCTION

Adolescence is the key period for the emergence and development of body-related issues and disordered eating behaviors (e.g., Stice, 2002; Neumark-Sztainer et al., 2011; Helfert and Warschburger, 2013). Disordered eating behaviors, such as emotional eating, are considered serious public health concerns for youth since they are developmental pathways to obesity even after weight loss (Thayer, 2001; Braet et al., 2008; O'Reilly and Black, 2015; Eichen et al., 2017). Therefore, it is

critical to understand psychosocial and emotional processes related to disordered eating behaviors (Stice, 2002; Neumark-Sztainer et al., 2011) and to identify protective psychological skills that can help youths develop a healthier relationship with their bodies and with food. Self-compassion has recently been suggested to have a beneficial role in body-related issues and in disordered eating (e.g., Braun et al., 2016; Rahimi-Ardabili et al., 2018). In addition, considering the important impact that parents have on psychological functioning and on the eating behavior of their children, it is also critical to understand how parenting may be related to adolescents' psychological processes and disordered eating behaviors. Mindful parenting is a parenting approach that may promote adolescents' self-compassion skills and psychological functioning (e.g., Parent et al., 2016; Moreira et al., 2018). Nevertheless, no studies have explored how mindful parenting may be associated with adolescents' disordered eating behaviors.

Emotional eating is a disordered eating behavior characterized by eating as an avoidant coping strategy to temporarily alleviate negative emotional states (Braet et al., 2014). Therefore, this eating behavior is intrinsically related to the inability to adequately regulate emotional states, especially painful or stressful ones (Evers et al., 2010). Emotional eating has been associated with poor psychological adjustment and eating disorders (e.g., anxiety and depressive symptoms, bulimia, binge eating disorder; Braet et al., 2008; Goossens et al., 2009); it is also a very common denominator and antecedent of other disordered eating behaviors (e.g., overeating; Zeeck et al., 2011). Emotional eating is more frequent among adolescents than among children (Wardle et al., 1992; Pearson et al., 2012; Bennett et al., 2013) and more frequent among youths with overweight/obesity than among youths with normal weight (Braet and van Strien, 1997).

One factor that has been considered a significant risk factor for engagement in disordered eating behaviors, such as emotional eating, is having negative feelings about one's body (Stice, 2002; Neumark-Sztainer et al., 2011). Although the literature has preferentially focused on body dissatisfaction issues among adolescents, especially those with overweight and obesity, there is also some interest in studying the role of body shame. Similar to body dissatisfaction, body shame involves negative thoughts and emotions about one's body but also encompasses more general negative feelings about the self that is objectified on the basis of the appearance (Calogero, 2012). Therefore, body shame arises from the evaluation of oneself or the perception that others evaluate oneself as inferior, flawed, or unattractive, with a desire to hide oneself and one's body (Gilbert, 2002).

To better understand this self-oriented emotion, one must consider the role of body image ideals (i.e., to be thin or muscular) strongly perpetuated by society that encourage weight stigma, which is highly prevalent among youths with overweight and obesity, especially among girls (Smolak and Levine, 2001; Latner and Stunkard, 2003; Puhl and Latner, 2007). Moreover, this weight-related stigmatization very often leads to generalizations about individuals with overweight/obesity, including negative generalizations such as having low intelligence and poor social skills (Lynagh et al., 2015). Adolescents (especially in the middle and late stages) are particularly vulnerable to the development

of appearance-related issues in the pursuit of the ideal body perpetuated by society and the desire to be accepted by others (Stice, 2002; Neumark-Sztainer et al., 2011; Helfert and Warschburger, 2013). Therefore, the frequent stigmatization that adolescents with overweight/obesity face increases the risk for negative psychological outcomes including poor quality of life and higher levels of body shame or eating disorders (Stice, 2002; Puhl and Latner, 2007; Eisenberg et al., 2012), thus influencing the way adolescents feel and relate to themselves.

Despite the scarce literature regarding the role of body shame among adolescents with different weights, there is some evidence to support the negative effect that this self-conscious emotion has on psychological function (Moreira and Canavaro, 2017a) and on the eating behavior of youths, especially those with overweight/obesity (Mustapic et al., 2015; Iannaccone et al., 2016). For instance, body shame was found to mediate the relationship between self-esteem and eating disorders among adolescents with different weights (Iannaccone et al., 2016), between body dissatisfaction and eating behaviors among adolescent girls with different weights (Mustapic et al., 2015), and between dispositional mindfulness and quality of life among older adolescents with overweight and obesity (Moreira and Canavaro, 2017a). Overall, these studies suggest that the greater one's body shame is, the higher the probability of having negative emotions about oneself or lower levels of positive psychological resources, thus leading to the development of disordered eating behaviors and psychological problems. Therefore, when adolescents experience higher levels of body shame, they may struggle to regulate those negative emotions about themselves and be more prone to engage in compensatory behaviors such as emotional eating.

Self-compassion is a psychological resource aimed at alleviating one's suffering with a caring and nurturing mentality, and it has been considered an adaptive strategy of emotion regulation or a coping strategy (McBeth and Gumley, 2012; Sirois et al., 2015). Self-compassion can be broadly defined as an adaptive way of relating to oneself by adopting an attitude of kindness toward one's difficult experiences with the desire to relieve one's own suffering (Gilbert and Procter, 2006; Neff, 2009). This state of mind encompasses higher levels of self-kindness and mindful awareness and the recognition that all human beings share a common humanity while demonstrating lower levels of self-judgment, overidentification, and isolation (Neff, 2003, 2009). Therefore, self-compassion has been associated with several psychological benefits among adolescents (e.g., lower levels of depression and anxiety symptoms, higher levels of well-being, greater life satisfaction, and less perceived stress; Neff and McGehee, 2010; Bluth et al., 2017).

Recently, some studies, mainly among adult women with both normal weight and overweight, have shown that self-compassion can also play an important role in the adoption of healthier behaviors, thus decreasing engagement in disordered eating behaviors and preventing negative weight-related outcomes (i.e., body dissatisfaction, body shame; e.g., Ferreira et al., 2013; Braun et al., 2016; Muris, 2016; Rahimi-Ardabili et al., 2018). Based on previous studies, self-compassion might enable more adaptive emotion regulation strategies, such as less self-critical thoughts

and less cognitive-behavioral avoidance (which often trigger disordered eating behaviors and body dissatisfaction), increasing acceptance and thereby facilitating healthy weight management (Adams and Leary, 2007; Mantzios and Wilson, 2014; Albertson et al., 2015). In addition, from a holistic point of view, a self-compassionate approach may simultaneously promote physiological and psychological self-care, that is, encouraging individuals to care equally about the body and the mind (Mantzios and Egan, 2017). Despite the growing interest in the field, to date, no studies have been conducted on the relationship between self-compassion skills and disordered eating behaviors among adolescents.

Parents can play an important role in the development of their children's self-compassion skills (Moreira et al., 2018). Through a mindful parenting approach, parents encourage the non-judgmental acceptance of difficult emotional states and foster the use of adaptive strategies of emotion regulation, leading to better adjusted psychological outcomes (Townshend et al., 2016; McKee et al., 2017). Mindful parenting is a parenting style characterized by intentionally bringing mindful awareness to everyday parent-child interactions (Kabat-Zinn and Kabat-Zinn, 1997; Bögels and Restifo, 2015) through the following important parenting practices or skills: directing complete attention to the child and being fully present during parent-child interactions; adopting an attitude of compassion, sensitivity, and responsiveness toward the child; adopting an attitude of non-judgmental acceptance of the self as a parent and of the challenges of parenting; self-regulating parents' own emotions and behaviors in the parent-child relationship in accordance with parenting values and goals; and developing emotional awareness of the self and the child (de Bruin et al., 2014; Moreira and Canavarró, 2017b).

Among the extensive research on this topic, studies have shown that parents with higher levels of mindful parenting adopt more positive parenting styles and practices and demonstrate more positive interactions and communication with their children (e.g., Lippold et al., 2015; Gouveia et al., 2016; Parent et al., 2016). Moreover, this parenting approach has been associated with several indicators of positive psychological functioning in children, such as lower levels of depressive, anxiety, internalizing and externalizing symptoms, and increased well-being (e.g., Bögels et al., 2013; Parent et al., 2016; Moreira et al., 2018). However, whether this parenting approach can help adolescents in their relationship with their body and eating behavior remains to be investigated. Nevertheless, it can be hypothesized that a parenting context based on mindful awareness, acceptance, and compassion toward the child may lead parents to more easily detect negative emotional states in their children and foster their expression, which can in turn facilitate adaptive emotion regulation of children's internal states. Moreover, when parents adopt a compassionate stance toward their children, children may learn to accept themselves as they are and as imperfect human beings. Therefore, in such a parenting context, adolescents may develop a healthier relationship with themselves, their bodies, and their eating behavior.

Research on the mechanisms that may account for the relationship between mindful parenting and adolescent

outcomes is still in its infancy. Nevertheless, recent studies have suggested that psychological resources such as mindfulness and self-compassion skills may explain why mindful parenting plays a beneficial role in adolescents' psychological functioning (Moreira et al., 2018; Wang et al., 2018). A better understanding of the mechanisms underlying the relationship between mindful parenting and adolescents' eating behavior may enable the development of more tailored interventions for youths with disordered eating behaviors.

The Present Study

The present study is a correlational, non-experimental, and cross-sectional study intended to explore whether mindful parenting is associated with adolescents' emotional eating and whether this association is explained by adolescents' self-compassion skills and body shame. These associations will be investigated in a group of adolescents with normal weight and adolescents with overweight/obesity. Although the relationship between mindful parenting and these outcomes has never been investigated, we hypothesize, based on previous studies regarding the role of mindful parenting on youth outcomes (e.g., Parent et al., 2016; Moreira et al., 2018), that higher levels of mindful parenting will be negatively associated with adolescents' emotional eating through higher levels of adolescents' self-compassion and lower levels of body shame.

Additionally, because these variables and/or the relationship between these variables may vary according to the stage of adolescence (Bluth et al., 2017), gender (Bluth et al., 2017), and weight group (Latzer and Stein, 2013), we also aimed to investigate whether the path model was invariant across two stages of adolescence (early vs. middle/late; Spano, 2004), gender (girls vs. boys), and three weight groups (normal weight vs. overweight/obesity not undergoing nutritional treatment vs. overweight/obesity undergoing nutritional treatment). We chose to take nutritional treatment into consideration because previous studies have generally found worse psychological outcomes among youth with overweight/obesity undergoing nutritional treatment than among youths with overweight/obesity from community samples (Goossens et al., 2009). In addition, since mindful parenting skills may vary according to parents' gender (Medeiros et al., 2016) and since parental weight status may influence adolescent outcomes (Bahreynian et al., 2017), we aimed to analyze the invariance of the path model across parents' gender (father vs. mother) and weight status (normal weight vs. overweight/obesity). We expect adolescents who are in the early stage of adolescence, boys, and adolescents with normal weight to report higher levels of self-compassion and lower levels of body shame and emotional eating than adolescents who are older, girls, and adolescents with overweight/obesity (e.g., Grabe et al., 2007; Braet et al., 2008; Bluth et al., 2017). We also expect fathers to report lower levels of mindful parenting skills than mothers (Medeiros et al., 2016). In addition, based on previous studies showing a stronger association between self-compassion and well-being outcomes among older adolescents (Bluth and Blanton, 2015) and girls

(Moreira et al., 2018) and showing this association to be mediated by body shame (Moreira and Canavarro, 2017a), we expected to find stronger associations between adolescent outcomes among adolescents in the middle/late stage and among girls.

MATERIALS AND METHODS

Participants

The sample comprised 572 dyads composed of a mother ($n = 445$; 77.8%) or a father ($n = 127$; 22.2%) and an adolescent between 12 and 18 years of age ($M = 14.34$, $SD = 1.59$). Of these adolescents, 323 had normal weight (56.5%; BMI = 3–85th percentiles), and 249 had overweight or obesity (43.5%; BMI \geq 85th percentile; WHO, 2006) according to the WHO Child Growth Standards. To accomplish the purpose of this study, we used the following inclusion criteria: (1) age between 12 and 18 years old; (2) no serious mental illness, developmental delays or genetic syndromes for which obesity is a comorbidity (according to teachers/nutritionists and educational/medical files); and (3) ability to understand and answer the questionnaires (according to teachers/nutritionists and educational/medical files). The main sociodemographic and clinical characteristics of the sample are presented in **Table 1**.

Procedure

The sample was collected in three Portuguese public school units ($n = 433$) and three pediatric public hospitals ($n = 139$) in the central region of Portugal. Authorizations for sample collection were obtained from the Portuguese Data Protection Authority, the Ethics Committee of the Faculty of Psychology and Educational Sciences of the University of Coimbra, the Ethics Committee, and the Board of Directors of each hospital and school unit. All participants were informed of the voluntary nature of the study and the confidentiality and anonymity of their answers. Participation in the study occurred at a single time point and consisted of the completion of self-report questionnaires that took, on average, 25 min for the parents and 15 min for the adolescents. A protected, safe and supportive atmosphere was provided during the administration of the questionnaires, both in schools and in hospitals, to ensure the dignity and the privacy of the participants. All participants were instructed to remain silent while completing the questionnaires, unless they had any doubt or questions. Moreover, they were instructed, both orally and in the written instructions provided on the first page of the questionnaire, to answer individually and honestly.

Dyads collected from public schools were recruited between March 2015 and April 2016. In total, 91 classes from the three units were randomly selected to participate in the study. Each class was visited twice by a research assistant. The purpose of the first visit was to present the study and its aims and to give each adolescent an envelope containing a letter explaining the study, the parent's informed consent form, and two identical questionnaires for the parents (one for the mother and one for the father). All parents completed a questionnaire with

sociodemographic and clinical information about themselves and their children and a self-report measure of mindful parenting [Interpersonal Mindfulness in Parenting (IMP) Scale]. One week later, on a second visit, those adolescents who assented to participate and whose parents provided informed consent completed the questionnaires. Adolescents completed the questionnaires in the classroom during a period of the class reserved for this purpose in the presence of the class teacher and the research assistant, who could assist them whenever necessary.

Dyads from hospitals were recruited from nutrition outpatient services between June 2015 and November 2016. For adolescents who were undergoing nutritional treatment to lose weight, a nutritionist prescribed an adequate diet and scheduled physical activity and provided other behavior modification recommendations suited to each adolescent. Before or after the nutrition consultation, adolescents with overweight/obesity and their parents were approached by a research assistant who described the study and requested their participation. Those who agreed to participate provided verbal assent (adolescents) and informed consent (parents) and completed the questionnaires in a private consultation office provided for the purpose by the health institution, in the presence of the research assistant. If participants were not available to complete the questionnaires at that moment, they could complete the questionnaire at home, but were instructed to do so in a period of time reserved for that task and in a silent and comfortable atmosphere. Moreover, parents were instructed to help adolescents only if they had any doubt, but they were told not to influence adolescents' answers. In such case, a preaddressed and stamped envelope was given to the participant to return the completed questionnaire by mail whenever possible. If questionnaires were not received in 2 weeks, a written message was sent to the mother or to the father to remind him/her to return the questionnaires.

Data from a total of 1532 mother/father–adolescent dyads were collected (1238 from schools and 294 from pediatric hospitals). Of these, 690 were triads composed of both a mother and a father of the same child. Therefore, 345 triads were randomly considered only as a mother–adolescent dyad, and the remaining 345 triads were considered only as a father–adolescent dyad to obtain a sample exclusively composed of independent observations (i.e., no father or mother was the parent of the same child). From the 1532 dyads, 912 cases were excluded because of non-responses to at least one study questionnaire or sociodemographic/clinical variables, and 48 cases were excluded for not meeting the inclusion criteria. These exclusions resulted in a final sample with 572 dyads composed of a mother or a father and an adolescent ($n = 433$ in the school sample; $n = 139$ in the hospital sample). Of the 433 dyads from public schools, 110 (25.40%) had a child with overweight/obesity, and 13 (11.82%) of them were undergoing nutritional treatment.

Measures

Sociodemographic Information

Mothers, fathers, and adolescents self-reported their sociodemographic and clinical information (i.e., mothers and fathers: age, education level, area of residence, cohabitation

TABLE 1 | Parents' and adolescents' sociodemographic and clinical characteristics by weight groups and group differences.

	Adolescents with normal weight <i>n</i> = 323	Adolescents with overweight/obesity not undergoing nutritional treatment <i>n</i> = 110	Adolescents with overweight/obesity undergoing nutritional treatment <i>n</i> = 139	Group differences	
				<i>F</i> / χ^2	η_p^2/Φ
Parents					
Age (years) <i>M</i> (<i>SD</i>); range	44.16 (5.43); 31–61	43.32 (4.62); 31–56	43.32 (5.36); 30–58	1.77	0.006
Gender <i>n</i> (%)					
Male	120 (37.2)	4 (3.6)	3 (2.2)	96.07***	0.368
Female	203 (62.8)	106 (96.4)	136 (97.8)		
Education level <i>n</i> (%)					
Basic or secondary	255 (78.9)	91 (82.7)	120 (86.3)	3.65	0.055
Graduate or post-graduate	68 (21.1)	19 (17.3)	19 (13.7)		
Area of residence <i>n</i> (%)					
Urban	76 (23.5)	21 (19.1)	40 (28.8)	3.24	0.021
Rural	247 (76.5)	89 (80.9)	99 (71.2)		
Cohabitation status <i>n</i> (%)					
Living with a partner	289 (89.5)	98 (89.1)	113 (81.3)	6.26*	0.032
Not living with a partner	34 (10.5)	12 (10.9)	26 (18.7)		
Weight category <i>n</i> (%)					
Normal weight	141 (43.7)	40 (36.4)	32 (23.0)	17.74***	0.100
Overweight/Obesity	182 (56.3)	70 (63.6)	107 (77.0)		
BMI <i>M</i> (<i>SD</i>); range	26.09 (3.94); 17.31–43.52	27.13 (4.60); 18.36–42.68	29.34 (5.37); 19.82–51.31	25.90***	0.083
Adolescents					
Age (years) <i>M</i> (<i>SD</i>); range	14.27 (1.63); 12–18	13.88 (1.48); 12–18	14.85 (1.44); 12–18	12.51***	0.042
Gender <i>n</i> (%)					
Male	119 (36.8)	54 (49.1)	61 (43.9)	5.77	0.100
Female	204 (63.2)	56 (50.9)	78 (56.1)		
zBMI <i>M</i> (<i>SD</i>); range	−0.17 (0.70); −1.93–1.00	1.70 (0.56); 1.01–3.56	2.20 (0.63); 1.04–3.95	759.11***	0.727
Presence of Health Conditions <i>n</i> (%)					
Yes	82 (25.4)	28 (25.5)	91 (65.5)	74.10***	0.097
No	241 (74.6)	82 (74.5)	48 (34.5)		
Type of health conditions <i>n</i> (%)					
Respiratory diseases	39 (47.6)	13 (46.4)	24 (26.4)	45.18**	0.293
Metabolic diseases	0 (0.0)	1 (3.6)	9 (9.9)		
Neurologic diseases	3 (3.7)	4 (14.3)	6 (6.6)		
Heart diseases	9 (11.0)	1 (3.6)	13 (14.3)		
Mental diseases	18 (22.0)	6 (21.4)	23 (25.3)		
Dermatologic diseases	3 (3.7)	1 (3.6)	9 (9.9)		
Digestive system diseases	0 (0.0)	0 (0.0)	1 (1.1)		
Genetic diseases	3 (3.7)	0 (0.0)	0 (0.0)		
Kidney diseases	0 (0.0)	0 (0.0)	3 (3.3)		
Spinal diseases	2 (2.4)	0 (0.0)	3 (3.3)		
Oncologic diseases	0 (0.0)	1 (3.6)	0 (0.0)		
Others	5 (6.1)	1 (3.6)	0 (0.0)		

p* < 0.05; *p* < 0.01; ****p* < 0.001.

status, weight, and height; adolescents: age, gender, weight, height, presence, and type of health conditions). For adolescents recruited in hospital settings, clinical information was also provided by the nutritionist, and only this source of information was considered. Each adolescent's and parent's BMI was

calculated using the formula $\text{weight}/[\text{height}]^2$, with weight (kg) and height (m) values. For adolescents, BMI z-scores (zBMI) were calculated according to the recommended WHO Child Growth Standards (2006) using WHO Anthro software provided by the WHO (2010).

Mindful Parenting

Parents' mindful parenting skills were assessed with the Portuguese version of the IMP Scale (Duncan, 2007; Moreira and Canavarro, 2017b). The Portuguese version contains 29 items rated on a five-point Likert response scale ranging from 1 (*never true*) to 5 (*always true*), with higher scores indicating higher levels of mindful parenting. This self-report questionnaire includes five subscales: Listening with Full Attention (e.g., "I rush through activities with my child without being really attentive to him/her"), Emotional Awareness of the Child (e.g., "I notice how changes in my child's mood affect my mood"), Self-Regulation in Parenting (e.g., "I often react too quickly to what my child says or does"), Non-judgmental Acceptance of Parental Functioning (e.g., "I listen carefully to my child's ideas even when I disagree with them"), and Compassion for the Child (e.g., "I am kind to my child when he/she is upset"). Both the original and the Portuguese versions have shown reliability and other adequate psychometric properties (Duncan, 2007; Moreira and Canavarro, 2017b). In this sample, Cronbach's alpha ranged between 0.60 (Non-judgmental Acceptance of Parental Functioning) and 0.80 (Compassion for the Child).

Self-Compassion

The Portuguese short form of the Self-Compassion Scale (SCS-SF) was used to measure adolescent's self-compassion skills (Raes et al., 2011; Castilho et al., 2015). The SCS-SF is a valid and reliable instrument with good psychometric proprieties to measure self-compassion in adolescent samples (Raes et al., 2011; Castilho et al., 2015). The short version includes 12 items (e.g., "I try to be understanding and patient toward those aspects of my personality I don't like") answered on a five-point Likert response scale ranging from 1 (*almost never*) to 5 (*almost always*). This instrument measures the six components of self-compassion (self-kindness, self-judgment, common humanity, isolation, mindfulness, and overidentification) and provides a total score for self-compassion, with higher scores reflecting higher self-compassion. In the current study, only the total score for self-compassion was used, and Cronbach's alpha was 0.75.

Body Shame

The body shame subscale of the Experience of Shame Scale (ESS; Andrews et al., 2002; Rodrigues, 2013) was used to assess the intensity with which adolescents have experienced cognitive and behavioral components of body shame in the last 3 months. Although originally developed to be used with adults, this subscale has also been used among adolescents (Moreira et al., 2015) and was validated in the Portuguese population in a sample of adolescents with adequate reliability and validity (Rodrigues, 2013). This subscale has four items (e.g., "Have you avoided looking at yourself in the mirror?") rated on a four-point Likert response scale ranging from 1 (*not at all*) to 4 (*very much*), with higher scores indicating higher levels of body shame. In the present study, Cronbach's alpha was 0.84.

Emotional Eating

Adolescents' emotional eating was assessed using the Portuguese version of the Emotional Eating subscale of the Dutch Eating

Behavior Questionnaire (DEBQ; van Strien et al., 1986; Viana and Sinde, 2008). This unidimensional instrument assesses the desire to eat under different emotional states (e.g., irritated, depressed, lonely, frightened, and disappointed) with 13 items ("Do you have a desire to eat when feeling lonely?") rated with a five-point response scale ranging from 0 (*never*) to 4 (*very often*). The DEBQ was originally intended for adults and adolescents, and the original and Portuguese versions have shown good factorial validity and reliability (van Strien et al., 1986; Viana and Sinde, 2008). Higher scores indicate higher levels of emotional eating. In this study, Cronbach's α was 0.92.

Data Analyses

Data analyses were conducted using the Statistical Package for the Social Sciences (SPSS Version 22.0; IBM SPSS, Armonk, NY, United States) and AMOS 22 (IBM® SPSS® AMOS™ Version 22.0; IBM Corporation, Meadville, PA, United States).

Descriptive statistics were computed for all sociodemographic, clinical, and study variables. Differences in the study variables as a function of the adolescent's weight group (i.e., adolescents with normal weight vs. adolescents with overweight/obesity not undergoing nutritional treatment vs. adolescents with overweight/obesity undergoing nutritional treatment) were analyzed with ANOVAs. Pearson correlations between the study variables and between the study variables and parents' and adolescents' sociodemographic and clinical variables were determined to identify possible covariates to introduce into the model. Cohen's guidelines were used to describe effect sizes of the correlations (i.e., small for correlations around 0.10, medium for those near 0.30, and large for correlations at 0.50 or higher; Cohen, 1988).

To examine whether mindful parenting [independent variable (IV)] was associated with emotional eating [dependent variable (DV)] through self-compassion skills [mediator 1 (M_1)] and body shame [mediator 2 (M_2)], we tested a path model using the maximum likelihood estimation method. Sociodemographic and/or clinical variables were entered as covariates if they were significantly correlated with the mediators or the DV. Criteria for adequate and good fit between the hypothesized model and the observed data were CFI and TLI values ≥ 0.90 and ≥ 0.95 , RMSEA values ≤ 0.08 and ≤ 0.06 , and SRMR values ≤ 0.10 and ≤ 0.08 , respectively (Browne and Cudeck, 1993; Hu and Bentler, 1999). Indirect effects were estimated using bootstrap resampling procedures with 2000 samples and a 90% bias-corrected confidence interval (BC90% CI). Multigroup analyses were performed to test the structural invariance of the path model across the stages of adolescence (early, ages 12–14, vs. middle/late adolescence, ages 15–18; Spano, 2004), gender (girls vs. boys), weight groups (normal weight vs. overweight/obesity not undergoing nutritional treatment vs. overweight/obesity undergoing nutritional treatment), and parental gender (father vs. mother) and weight (normal weight vs. overweight/obesity). Adolescents in the middle (15–16 years of age; $n = 164$; 69.2%) and late (17–21 years of age, $n = 73$; 30.8%) stages of adolescence were grouped in the same category (Spano, 2004). Each multigroup analysis compared the baseline or unconstrained model (i.e., configural invariance model, which

is a model without equality constraints on parameters) with a model in which structural weights were controlled to be equal across groups. The path model was considered to be invariant across groups when a non-significant chi-square difference ($\Delta\chi^2$) was found between the constrained and unconstrained models. Secondary analyses were performed to explore the direct and indirect effects in the path model considering all the dimensions of mindful parenting. Specific indirect effects were estimated using an AMOS user-defined estimand. The empirical power tables proposed by Fritz and Mackinnon (2007) for mediation models suggest that the sample size for this study is sufficient to find a mediation effect, including small to medium a and b paths (0.26) with a power of 0.80.

RESULTS

Preliminary Analyses

Differences in the study variables between weight groups (i.e., dyads including adolescents with normal weight, overweight/obesity not undergoing nutritional treatment, and overweight/obesity undergoing nutritional treatment) are shown in **Table 2**. No significant differences were found for mindful parenting ($p = 0.397$), self-compassion ($p = 0.070$), and emotional eating ($p = 0.161$). In contrast, significant differences were found for body shame, with adolescents with overweight/obesity undergoing nutritional treatment presenting higher levels of body shame than those not undergoing nutritional treatment ($p = 0.021$) and those with normal weight ($p < 0.001$). In addition, adolescents with overweight/obesity not undergoing nutritional treatment presented higher levels of body shame than did adolescents with normal weight ($p < 0.001$). Despite this difference in body shame, the three groups were analyzed together in the subsequent analyses.

Correlations Between Study Variables and Between Study, Sociodemographic, and Clinical Variables

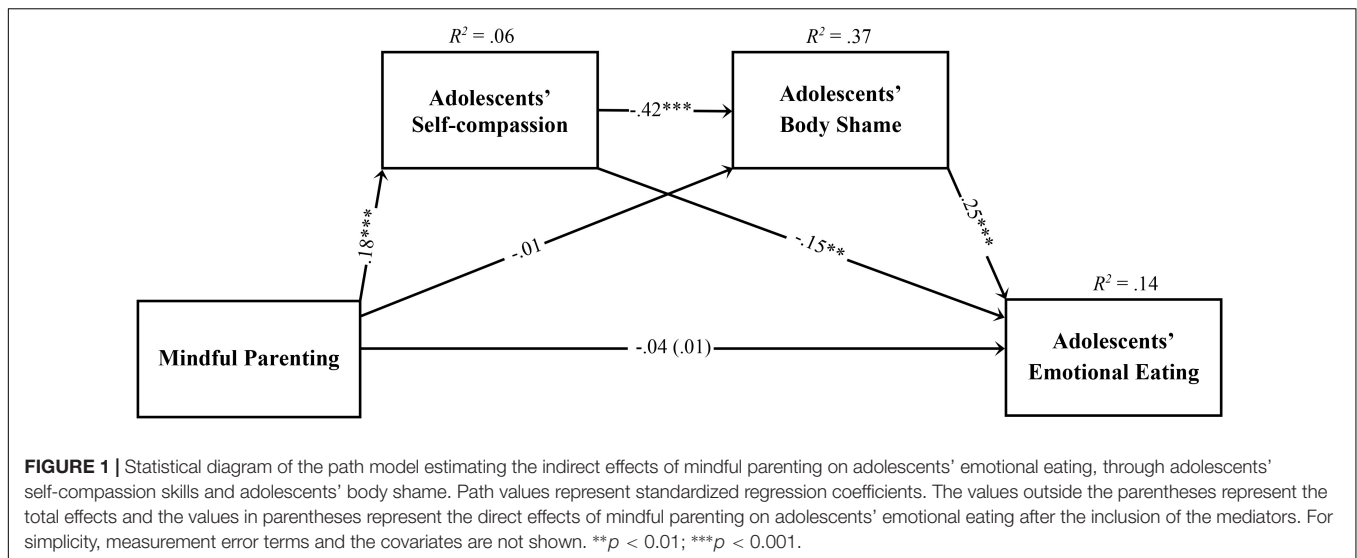
The descriptive statistics for the study variables and bivariate correlations between the study variables and between the study variables and the sociodemographic and clinical characteristics of adolescents and their parents are presented in **Table 2**. Positive small to medium correlations were found between mindful parenting and self-compassion and between body shame and emotional eating. Negative small to large correlations were found between mindful parenting and body shame, between self-compassion and body shame, and between self-compassion and emotional eating.

Positive and negative small to medium correlations were found between the study variables and sociodemographic and clinical characteristics (**Table 2**). Adolescents' age, gender, zBMI, and presence of health conditions, as well as parents' gender, education level, cohabitation status, and BMI, were introduced as covariates in the path model.

TABLE 2 | Descriptive statistics, differences between weight groups and correlations between study, sociodemographic, and clinical variables.

	Descriptive statistics		Group differences		Correlations between study variables			Correlations between study variables and sociodemographic and clinical variables										
	M	SD	Range	F	η_p^2	1	2	3	Adolescents			Parents						
									Age	Gender	zBMI	Presence of health conditions	Age	Gender	Education level	Area of residence	Cohabitation status	BMI
1. Mindful Parenting	106.99	12.30	56.00–137.00	0.93	0.003	–	–	–	0.01	–0.04	–0.03	0.02	0.01	0.05	0.08	–0.02	–0.02	–0.09*
2. Adolescents' Self-Compassion	3.23	0.61	1.08–5.00	2.67	0.009	0.18**	–	–0.13**	–0.05	–0.12**	0.00	0.00	–0.01	–0.04	0.07	–0.03	0.02	–0.05
3. Adolescents' Body Shame	6.77	2.81	4.00–16.00	34.16***	0.107	–0.09*	–0.48**	–	0.20**	0.25**	0.34**	0.17**	0.03	0.20**	–0.02	–0.07	–0.09*	0.14**
4. Adolescents' Emotional Eating	11.68	9.65	0.00–52.00	1.83	0.006	–0.05	–0.28**	0.34**	0.10*	0.15**	0.08*	0.06	0.00	0.04	–0.10*	–0.05	–0.01	0.04

Correlations were performed in the total sample. Gender: 0 = male, 1 = female; presence of health conditions: 0 = no, 1 = yes; education level: 0 = basic or secondary education, 1 = graduate or post-graduate education; area of residence: 0 = urban, 1 = rural; cohabitation status: 0 = not living with a partner, 1 = living with a partner. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.



Indirect Effect of Mindful Parenting on Adolescents' Emotional Eating Through Adolescents' Self-Compassion and Body Shame

The baseline model with the total score of mindful parenting failed to present a good fit to the data ($\chi^2(47) = 286.06$, $p < 0.001$; CFI = 0.618; TLI = 0.463; SRMR = 0.088; RMSEA = 0.094, $p < 0.001$; 90% CI = [0.08, 0.11]). Therefore, we examined modification indices, which suggested that the residuals belonging to some of the covariates might be correlated and were performed individually, and the model re-estimated in sequential steps as follows: adolescent's BMI and parent's gender, adolescent's zBMI and parent's BMI, adolescent's presence of health conditions and parent's gender, adolescent's presence of health conditions and zBMI. The respecified path model presented a good fit to the data, $\chi^2(43) = 78.49$, $p < 0.001$; CFI = 0.943; TLI = 0.913; SRMR = 0.047; RMSEA = 0.038, $p = 0.931$; 90% CI = [0.02, 0.05] and explained 14% of the adolescents' emotional eating variance (Figure 1). The difference between the first and final model was significant, $\Delta\chi^2(4) = 207.57$, $p < 0.001$, suggesting that the respecified model presented a significantly better fit to the data than did the original model.

As presented in Figure 1, the total and direct effects of mindful parenting skills on adolescents' emotional eating were non-significant. Moreover, significant indirect effects were found for the association between mindful parenting and adolescents' body shame through adolescents' self-compassion skills ($b = -0.075$, $p = 0.001$, 90% CI [-0.106, -0.048]), for the association between adolescents' self-compassion skills and emotional eating through body shame ($b = -0.107$, $p = 0.001$, 90% CI [-0.145, -0.072]), and for the association between mindful parenting and emotional eating through the two mediators sequentially ($b = -0.015$, $p = 0.001$, 90% CI [-0.023, -0.009]) and through self-compassion only ($b = -0.021$, $p = 0.002$, 90% CI [-0.037, -0.009]). The indirect effect of mindful parenting on emotional

eating through body shame only was non-significant ($b = -0.001$, $p = 0.787$, 90% CI [-0.013, 0.010]).

Invariance Analyses

Multigroup analyses were performed to test the structural invariance of the path model across adolescents' stage of adolescence, gender, and weight group and parents' gender and weight. In each model, the variable under study was not introduced as a covariate. The path model was invariant across the two stages of adolescence, across adolescents' weight groups, across mothers and fathers, and across parents' weight groups but not across adolescents' gender (Table 3).

To identify which paths accounted for the non-invariance between adolescents' gender groups, we investigated the critical ratios for differences between parameters. There were non-invariant associations between mindful parenting and adolescents' self-compassion (boys: $\beta = 0.090$, $p = 0.162$; girls: $\beta = 0.221$, $p < 0.001$) and between adolescents' self-compassion and adolescents' body shame (boys: $\beta = -0.251$, $p < 0.001$; girls: $\beta = -0.505$, $p < 0.001$). Therefore, the relationship between mindful parenting and adolescents' self-compassion was significant for girls only, and the relationship between adolescents' self-compassion and adolescents' body shame was stronger for girls. Examining the differences between the unconstrained model and six models in which the structural weight of a single path was fixed to be equal across groups revealed significant differences between the unconstrained model and the model in which the path linking mindful parenting and adolescents' self-compassion was constrained, $\Delta\chi^2(1) = 4.85$, $p = 0.028$, and the model in which the path linking adolescents' self-compassion and adolescents' body shame was constrained, $\Delta\chi^2(1) = 8.23$, $p = 0.004$, supporting the differences suggested by the examination of critical ratios. Finally, we analyzed the indirect effects in each group to verify which indirect effects varied. The indirect effects between mindful parenting and adolescents' body shame through self-compassion (boys: $b = -0.02$, $p = 0.102$, 90% CI = [-0.05,

TABLE 3 | Invariance analyses.

	Constrained model						Unconstrained model						$\Delta\chi^2$	<i>p</i>
	χ^2 (DF)	CFI	TLI	SRMR	RMSEA [CI]	χ^2 (DF)	CFI	TLI	SRMR	RMSEA [CI]	$\Delta\chi^2$ (DF)			
Stage of adolescence	100.74 (86)	0.974	0.967	0.048	0.017 [0.00, 0.03]	82.78 (70)	0.977	0.964	0.045	0.018 [0.00, 0.03]	17.96 (16)	0.326		
Adolescent's gender	125.57 (85)**	0.928	0.906	0.049	0.029 [0.02, 0.04]	96.07 (68)*	0.950	0.919	0.030	0.040 [0.01, 0.04]	29.50 (17)	0.030		
Adolescent's weight group	198.59 (146)**	0.868	0.985	0.056	0.025 [0.02, 0.03]	157.53 (114)**	0.891	0.842	0.054	0.026 [0.02, 0.04]	41.06 (32)	0.131		
Parent's gender	132.01 (88)**	0.906	0.882	0.093	0.030 [0.02, 0.04]	104.39 (70)**	0.926	0.884	0.082	0.029 [0.02, 0.04]	27.63 (18)	0.068		
Parent's BMI	98.69 (66)	0.977	0.970	0.052	0.016 [0.00, 0.03]	82.64 (68)	0.973	0.956	0.047	0.019 [0.00, 0.03]	16.05 (18)	0.589		

p* < 0.05; *p* < 0.01; ****p* < 0.001.

0.00]; girls: $b = -0.11$, $p = 0.001$, 90% CI = $[-0.16, -0.07]$) and between mindful parenting and emotional eating through self-compassion followed by body shame (boys: $b = -0.01$, $p = 0.089$, 90% CI = $[-0.01, 0.00]$; girls: $b = -0.02$, $p = 0.002$, 90% CI = $[-0.03, -0.01]$) and through self-compassion only (boys: $b = -0.01$, $p = 0.150$, 90% CI = $[-0.02, 0.00]$; girls: $b = -0.03$, $p = 0.001$, 90% CI = $[-0.07, -0.02]$) were significant for girls only. The indirect effect between self-compassion and emotional eating through body shame was significant for both groups.

Exploratory Analyses of the Role of Mindful Parenting Dimensions

Secondary analyses were performed to explore the direct and indirect effects of mindful parenting dimensions on adolescents' emotional eating, and the same covariates of the model with the total score were entered and correlated with each other (Figure 2). The model demonstrated a good fit to the data ($\chi^2(75) = 155.05$, $p < 0.001$; CFI = 0.944; TLI = 0.910; SRMR = 0.048; RMSEA = 0.043, $p = 0.872$; 90% CI = [0.03, 0.05]) and explained 15% of the variance in adolescents' emotional eating. Direct effects are presented in Figure 2, and indirect effects are presented in Table 4. Significant direct effects were found between compassion for the child and self-compassion, between listening with full attention and emotional eating, between self-compassion and body shame, between self-compassion and emotional eating, and between body shame and emotional eating. Moreover, several significant indirect effects were found, namely, between compassion for the child and body shame through self-compassion, between self-compassion and emotional eating through body shame, and between compassion for the child and emotional eating through self-compassion only and through self-compassion skills followed by body shame.

DISCUSSION

This study explored an integrative model suggesting that higher levels of mindful parenting skills were associated with lower levels of adolescents' emotional eating through higher levels of adolescents' self-compassion skills in isolation or followed by lower levels of body shame, but only among adolescent girls, regardless of their weight. Therefore, these findings suggest two sequences of mechanisms through which a mindful parenting approach might be associated with adolescents' emotional eating behavior. Mindful parenting may allow the development of self-compassion skills in adolescents, which may reduce emotional eating, and these self-compassion skills may allow adolescents to accept their body shape and appearance, thus preventing engagement in eating behaviors to compensate for negative emotional states. Additionally, the mindful parenting dimension of compassion for the child was the only dimension that was indirectly associated with emotional eating. Our findings also suggest that both adolescent boys and girls with greater self-compassion skills engaged less in emotional eating behaviors because they had lower levels of body shame.

As suggested in previous studies, mindful parenting might be an ideal ground for the development of important psychological

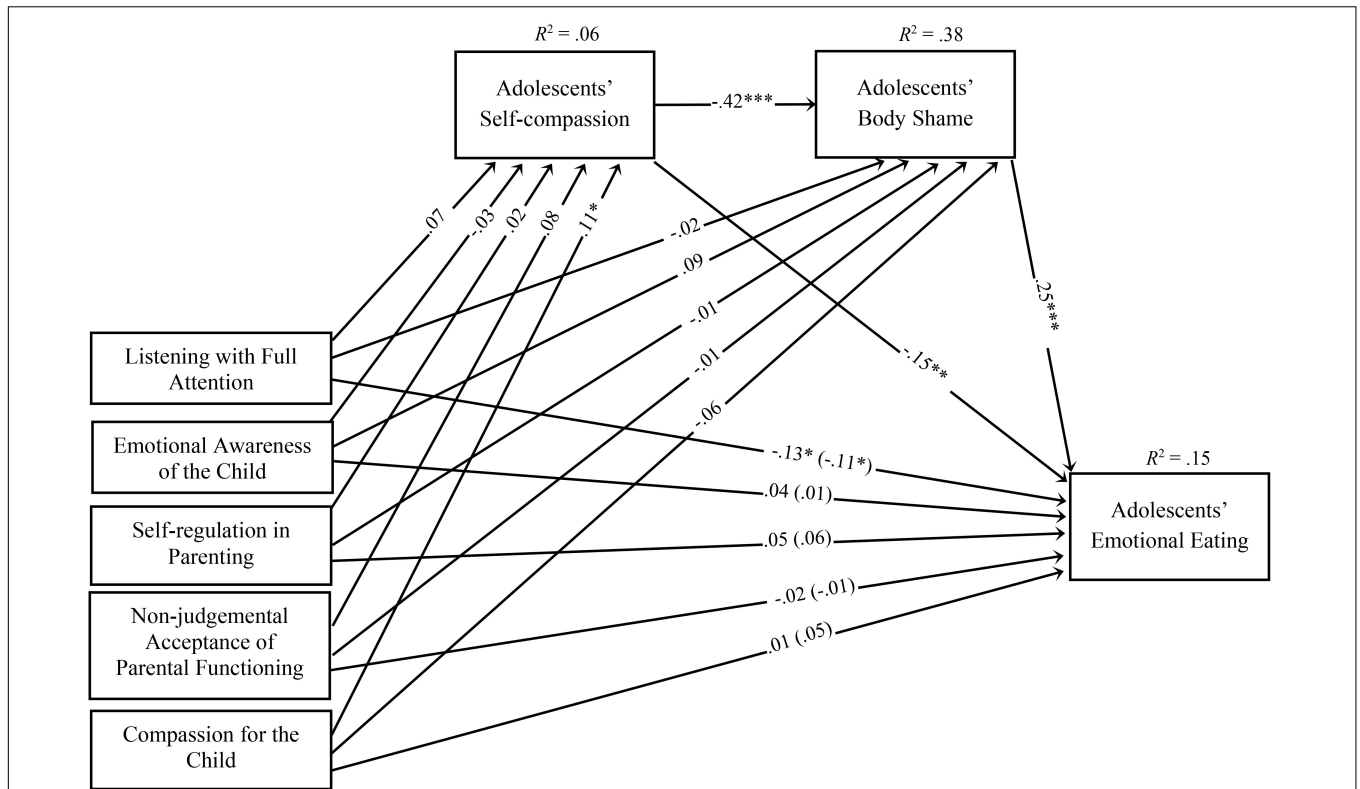


FIGURE 2 | Path model examining the associations between the five dimensions of mindful parenting on adolescents' emotional eating through adolescents' self-compassion skills and adolescents' body shame. Path values represent standardized regression coefficients. The values outside the parentheses represent the total effects and the values in parentheses represent the direct effects of the mindful parenting dimensions on adolescents' emotional eating after the inclusion of the mediators. For simplicity, measurement error terms and covariates are not shown. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

TABLE 4 | Indirect and specific indirect effects of mindful parenting dimensions on adolescents' emotional eating through adolescents' self-compassion and body shame.

	Unstandardized coefficients	Standardized coefficients	p-value	BC90%CI Lower/upper
<i>Indirect effects</i>				
LFA → Self-compassion → Body Shame	-0.025	-0.028	0.208	-0.064/0.008
EAC → Self-compassion → Body Shame	0.016	0.013	0.609	-0.027/0.051
SR → Self-compassion → Body Shame	-0.049	-0.009	0.650	-0.050/0.026
NJAPF → Self-compassion → Body Shame	-0.161	-0.033	0.112	-0.069/0.001
CC → Self-compassion → Body Shame	-0.219	-0.048	0.042	-0.085/-0.008
LFA → Self-compassion → Body Shame → Emotional Eating	-0.067	-0.022	0.179	-0.054/0.004
EAC → Self-compassion → Body Shame → Emotional Eating	0.129	0.030	0.091	0.001/0.063
SR → Self-compassion → Body Shame → Emotional Eating	-0.161	-0.009	0.577	-0.040/0.018
NJAPF → Self-compassion → Body Shame → Emotional Eating	-0.343	-0.020	0.172	-0.046/0.005
CC → Self-compassion → Body Shame → Emotional Eating	-0.713	-0.045	0.014	-0.081/-0.015
Self-compassion → Body Shame → Emotional Eating	-1.675	-0.106	0.001	-0.145/-0.072
<i>Specific indirect effects</i>				
CC → Self-compassion → Emotional Eating	-0.265		0.026	-0.605/-0.060
CC → Body Shame → Emotional Eating	-0.256		0.194	-0.684/0.060
CC → Self-compassion → Body Shame → Emotional Eating	-0.192		0.030	-0.367/-0.045

Specific indirect effects were only estimated for significant general indirect effects. LFA, listening with full attention; EAC, emotional awareness of the child; SR, self-regulation in parenting; NJAPF, non-judgmental acceptance of parental functioning; CC, compassion for the child; BC90%CI, 90% bias-corrected and accelerated confidence interval.

resource in adolescents, such as self-compassion (Moreira et al., 2018). Parents with higher levels of mindful parenting foster positive and secure parent–child relationships based on a warm, compassionate, acceptant, and respectful mentality that in turn promotes adolescents' well-being (Medeiros et al., 2016) and self-compassion skills (Moreira et al., 2018). Moreover, these parents are generally more likely to adopt adaptive coping strategies when facing difficult thoughts and emotions, as they tend to have higher levels of self-compassion and dispositional mindfulness (Gouveia et al., 2016; Moreira et al., 2016). Therefore, a child with parents with higher levels of mindful parenting may develop self-compassion skills by both observing and modeling how their parents generally relate to themselves in difficult situations (i.e., observational learning) and how parents relate to their children and their emotions (i.e., positive family experiences; Neff and McGehee, 2010; Moreira et al., 2016). Both of these experiences may stimulate a self-compassionate inner dialog in the child that is particularly important when experiencing negative emotions. Therefore, this study provides further support to consider self-compassion as a psychological mechanism through which mindful parenting influences adolescents' psychological outcomes.

By developing a stance of self-compassion and self-kindness toward themselves, adolescents may engage less in self-judgments, overidentification with internal states, or isolation in times of suffering but may instead develop an attitude of self-kindness when facing their own suffering by being aware of it and recognizing that all human beings suffer (Neff, 2003, 2009). Therefore, these adolescents will be more capable of addressing the challenges of this developmental stage, such as the challenges associated with fitting the ideal body image perpetuated by society (i.e., thinness schema; e.g., Latner and Stunkard, 2003; Puhl and Latner, 2007). With body shame considered to be a self-oriented emotion based on ruminative and self-critical thoughts and emotions (Cheung et al., 2004), having higher levels of self-compassion may prevent the cycle of negative self-evaluations of one's body and subsequent generalizations to more global negative feelings about the self. These findings are supported by previous studies that have found a significant negative association between mindfulness skills and body shame in adolescents with overweight/obesity (Moreira and Canavarro, 2017a) and have suggested that the experience of body shame is inversely associated with a present-centered awareness and a compassionate and non-judgmental stance (Woods and Proeve, 2014). Because mindful awareness and a compassionate stance are intrinsically associated, developing these psychological resources may help adolescents to distance themselves from self-ruminative thoughts about their appearance and from experiencing shame in this domain.

In addition, as suggested by the results of this study and in accordance with previous studies (e.g., Mustapic et al., 2015; Iannaccone et al., 2016), when this cycle of negative self-oriented emotions based on appearance is interrupted, adolescents are less likely to engage in emotional eating behaviors. For instance, body shame generates negative thoughts and emotions about one's body and oneself in general that often have a critical

tone, which may increase the urge to engage in compensatory behaviors to alleviate these negative emotions. This maladaptive cycle of emotion regulation may foster certain eating behaviors as a way to address negative (and unpleasant) emotions, that is, to eat when negative emotions are inadequately regulated. Moreover, the results of this study found a significant negative association between self-compassion skills and emotional eating. Although similar results have already been found among adult women with normal weight and obesity (e.g., Ferreira et al., 2013; Braun et al., 2016; Rahimi-Ardabili et al., 2018), to our knowledge, this study is the first to demonstrate this association among adolescents with different weights. Related to the previous result, having higher levels of self-compassion skills, which is also considered a positive psychological resource, may allow negative emotions to be regulated with a kind and non-judgmental perspective instead of with overidentification and a critical attitude (e.g., Adams and Leary, 2007; Mantzios and Wilson, 2014). Therefore, developing self-compassion decreases engagement in disordered eating behaviors such as emotional eating by interrupting the maladaptive cycle of emotion regulation.

We also found that both adolescent boys and girls with higher levels of self-compassion had lower levels of emotional eating and that this association was mediated by lower levels of body shame. This novel result suggests an interrelationship among these constructs and a sequence of mechanisms that may generate emotional eating behaviors among adolescents. Although these results highlight the role that self-compassion skills and body shame may play in adolescents' eating behavior, future longitudinal studies should ascertain whether adolescents' self-compassion can lead to lower levels of body shame or whether higher body shame can lead to lower levels of self-compassion skills, which can in turn trigger emotional eating behaviors.

Secondary analyses with all the mindful parenting dimensions showed that compassion for the child was the only significant dimension indirectly associated with emotional eating. Being compassionate, kind, and sensible with respect to a child's needs seems to be particularly important in promoting the development of self-compassion skills in adolescents, which may in turn protect adolescents from experiencing body shame and engage in eating behaviors to compensate for these negative emotional states. These novel findings are supported by the theoretical background and recent studies. For instance, Moreira et al. (2018) found that being a compassionate parent may foster a more secure relationship between the parent and the child, which in turn promotes the development of adolescents' self-compassion skills. In the present study, being a compassionate parent was directly associated with adolescents' self-compassion. In fact, by adopting an attitude of kindness, sensitivity, and responsiveness to the child's needs, a parent may transmit to the child (both directly and indirectly through their actions) how to adequately relate to oneself, especially when facing difficult situations.

Additionally, we found a negative direct link between listening with full attention to the child and adolescents' emotional eating. Although this finding warrants further investigation, it

suggests that when parents are fully present in parent–child interactions and direct their complete attention to their children, those children may feel more emotionally supported and have less need to engage in emotional compensatory behaviors (e.g., to eat) to alleviate their emotions. In this way, the lack of emotional attention that could be temporarily satisfied by food could be reduced since the parents provided the emotional attention the child needed. Although these are tentative explanations, this result indicates that a mindful approach to parenting may influence children's emotion regulation processes, which may be masked by eating behaviors. Therefore, further investigation is needed to deepen the knowledge of how mindful parenting may influence children's eating behaviors.

Another relevant finding was that these indirect effects were significant for girls only. As hypothesized, the associations in the model may be more salient among girls than among boys since body image-related issues and disordered eating behaviors are especially common among adolescent girls (Pearson et al., 2012; Bluth et al., 2017). In fact, previous research has shown that compared with girls, boys are not as heavily influenced by the body image ideals perpetuated by society and are not as prone to engage in eating behaviors to compensate for negative emotions (Puhl and Latner, 2007; Bluth et al., 2017).

In contrast to our expectations, the model was invariant across the stages of adolescence, although, as expected, lower levels of self-compassion skills and higher levels of body shame and emotional eating were significantly correlated with the middle/late stage of adolescence. The model was also invariant across weight groups (adolescents with normal weight and with overweight/obesity undergoing or not undergoing nutritional treatment). Moreover, in contrast to our expectations, we found no differences between weight groups for self-compassion skills and emotional eating; however, a negative correlation was found between zBMI and self-compassion skills, and positive correlations were found between zBMI and body shame and between zBMI and emotional eating. Significant differences between weight groups were found for body shame only, as adolescents with overweight/obesity who were undergoing nutritional treatment presented higher levels of body shame than did adolescents in other groups. In addition, adolescents with overweight/obesity who were not undergoing nutritional treatment presented higher levels of body shame than did adolescents with normal weight; these findings are in accordance with previous studies (Goossens et al., 2009). Therefore, a better understanding of the role of the stage of adolescence and weight group might provide important insights into which adolescents may benefit more from specific interventions, such as interventions based on self-compassion.

Some limitations of this study must be noted. First, the cross-sectional design of the study prevents the establishment of causal relationships; therefore, alternative models may be hypothesized. For instance, self-compassion skills could mediate the association between body shame and emotional eating behaviors in adolescents since this psychological resource is aimed at alleviating negative emotions. Nevertheless, future

studies with longitudinal designs may ascertain the direction of these associations or identify which of them may be more beneficial at the clinical level. Second, although this study comprised a large sample, it was collected from only three public schools and three hospitals in the central region of Portugal, and most parents were mothers, had overweight/obesity, were living with a partner, had completed basic or secondary education, and lived in rural areas; these characteristics compromise the representativeness of the sample and the generalization of the results to parents from different sociodemographic backgrounds. Third, two different procedures were used to collect anthropometric data from adolescents: for adolescents undergoing nutritional treatment, weight and height were objectively measured by the nutritionist, whereas for adolescents not undergoing nutritional treatment, weight and height were subjectively measured by self-reports. Future studies should overcome this limitation by using the same calibrated balance with all participants since youths may not accurately self-report their weight and height (Brenner et al., 2003; Tokmakidis et al., 2007). Moreover, it would have been interesting to monitor nutritional treatment and weight over time and to understand the physical activity habits of the adolescents. Fourth, only self-report measures were used, which can compromise the validity of the results because participants may be influenced by social desirability and not reliably report their inner states. Fifth, the Emotional Eating subscale of the DEBQ measures the urge to eat rather than the actual eating behavior. Future studies should use more proximal instruments that can measure the frequency of real eating episodes under different emotional states. Sixth, in this sample, Cronbach's alphas between 0.60 and 0.70 were obtained for three of the mindful parenting subscales (Emotional Awareness of the Child, Self-regulation in Parenting, and Non-judgmental Acceptance of Parental Functioning). Nevertheless, some authors agree that Cronbach's alpha values above 0.60 are adequate, particularly in exploratory and psychology research, even though the generally acceptable lower limit is 0.70 (Aron and Aron, 1999).

Despite these limitations, this study has important strengths. It provides preliminary evidence for the benefits of adopting a mindful parenting approach in the context of adolescents' eating behavior, and it improves our understanding of the mechanisms explaining why this parenting approach is associated with adolescents' emotional eating. Specifically, the current study proposes an innovative comprehensive model of the sequence of mechanisms underlying the relationship between mindful parenting and emotional eating in adolescents with different weights, highlighting the complexity and the interrelationship between parent and adolescent variables. This study innovatively suggests that mindful parenting, particularly compassion for the child, plays an important role in conveying a caring and compassionate attitude to the child when facing difficult emotions, protecting the child against experiencing higher levels of body shame, and engaging in emotional eating behaviors to compensate for these negative emotional states. By studying these associations in a sample of adolescents with different weights, this study provides a novel and promising approach

to the study of adolescents' eating behaviors. For instance, by developing a mindful posture in parenting, parents may help adolescents develop self-compassion skills, which may be very beneficial for adolescents' psychological adjustment and eating behavior. Nevertheless, the cross-sectional design of this study accentuates the need for future longitudinal studies and randomized controlled trials on mindful parenting-based interventions to better understand the presumed positive impact of this parental approach.

These results also provide further support to consider the role of gender in these associations, since the model was significant for adolescent girls only. Therefore, girls would probably benefit more from an intervention aimed at diminishing body shame and emotional eating issues. According to the results of this study, such an intervention could include self-compassion training for adolescents and a mindful parenting-based intervention, with a special focus on the dimension of compassion for the child but also on the dimension of listening with full attention to the child. Additionally, the associations between the variables in the model are invariant across adolescents' weight groups, which suggests that the regulation of negative emotions about one's body does not depend on the weight. Nevertheless, the role of adolescents' gender and weight status has received little attention with respect to mindful parenting, and future studies should further explore it.

CONCLUSION

Emotions can have a substantial impact on eating behavior. Therefore, it is necessary to shift the focus of disordered eating behavior treatment from only dietary-based programs to more complete and comprehensive approaches. This study provides preliminary and novel support to consider the beneficial role of both mindful parenting and self-compassion skills in adolescents struggling with feelings of body shame and engaging in emotional eating behaviors. Therefore, a broader approach that includes both adolescents and their parents and that targets both the eating behaviors and the emotional processes behind those behaviors may have more long-term results. Considering the importance

that adolescents place on their bodies and how it may influence their psychological adjustment and eating behavior, developing a compassionate posture when facing negative emotions might facilitate, from an early age, a healthier relationship with their emotions and bodies and ultimately with food. As parents are significant figures in adolescents' lives, they may play a determinant role in promoting self-compassion skills in their children. The clinical implications are promising, but future studies with more robust methodologies are certainly needed.

ETHICS STATEMENT

This study was carried out in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards with written informed consent from all subjects. All subjects gave written informed consent in accordance with the Declaration of Helsinki of 1964. The protocol was approved by the Portuguese Data Protection Authority, the Ethics Committee of the Faculty of Psychology and Educational Sciences of the University of Coimbra, the Board of Directors of each school unit, and the Ethics Committee and the Board of Directors of each hospital.

AUTHOR CONTRIBUTIONS

MG designed and executed the study, assisted with the data analyses, and wrote the paper. MC collaborated in the writing and editing of the final manuscript. HM collaborated with the design, data analyses and writing of the study. All authors approved the final version of the manuscript for submission.

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The Role of Mindful Parenting in Individual and Social Decision-Making in Children

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Children are confronted with an increasing amount of choices every day, which can be stressful. Decision-making skills may be one of the most important “21st century skills” that children need to master to ensure success. Many aspects of decision-making, such as emotion regulation during stressful situations, develop in the context of caregiver-child interactions. This study examined whether mindful parenting predicts children’s individual and social decision-making. The current study included 63 mother-child dyads from The Netherlands (Child $M_{age} = 5.11$, $SD = 0.88$, 50.8% girls). Mothers completed the Dutch version of the Interpersonal Mindfulness in Parenting Scale (IM-P). A “Choice Task” was developed to measure individual decision-making skills, and a “Sharing Task” was created to measure social decision-making in young children. Higher maternal mindful parenting significantly predicted more sharing after controlling for covariates (child age, sex, SES, maternal education level; $Wald = 4.505$, $p = 0.034$). No main effect of maternal mindful parenting was found for any of the individual decision-making measures. These findings suggest that mindful parenting supports children’s social decision-making. Future research should investigate if the combination of mindful parenting and children’s early decision-making skills predict key developmental outcomes.

Keywords: mindful parenting, children, choice-related stress, decision-making, sharing

Rapid societal advancements in daily life and the modern economy have led to demand for the next generation to develop a multitude of skills beyond traditional academic learning to prepare them for the “real world” (Binkley et al., 2012). Scholars and professionals alike stress the importance of these learning, adaptation, and interpersonal skills, often referred to as “21st century skills.” Decision-making skills may be one of the most essential 21st century skills for children to master as they play an important role in making effective and informed choices as children navigate real-life problems as they arise. It is critically important for children to learn to make effective decisions and to successfully manage their emotions and behaviors as they deal with the consequences of those decisions.

Decision-making often occurs in affectively charged contexts (Schwarz, 2000), which means that decision-making requires adaptive regulation of emotions. Moreover, a large body of literature provides evidence that emotional self-regulation develops within the context of high-quality parent-child relationships (Thompson, 1994), beginning in the early years of

life (Beeghly and Tronick, 2011). Furthermore, the quality of mother-child interactions has been found to be associated with the children's development of adaptive social behaviors including positive emotion expression and assertiveness (Denham et al., 1991). In a longitudinal study examining mother-child interaction and child outcomes, maternal parenting behavior characterized as sensitive and supportive in early childhood was linked to later child academic performance and social behavior in middle childhood (Morrison et al., 2003).

Mindful parenting has been identified as a promising approach that promotes emotion regulation in parents and children (Duncan et al., 2009). Thus, one way to support children's development of 21st century skills may be to support parents' use of mindful parenting. Mindful parenting is rooted in the construct of mindfulness, which Kabat-Zinn (2003) conceptualizes as the practice of awareness in the moment that is cultivated by increased attention without judgment and reactivity. When applied to the context of the parent-child relationship, mindful parenting is posited to not only improve parent emotion regulation but also to foster healthy parent-child relationships and promote improved child emotion regulation (Duncan et al., 2009). However, whether mindful parenting could also be advantageous for a child's specific 21st century skills that involve emotion regulation, such as social decision-making behaviors, is still unknown.

DECISION-MAKING

Empirical studies that examine decision-making in children focus on multiple dimensions of self-regulation, including inhibitory control and the delay of gratification (Kerr and Zelazo, 2004; Geurts et al., 2006; Kidd et al., 2013; Lee and Carlson, 2015). These studies primarily use paradigms such as the Marshmallow Task (Mischel, 1974, 2014) and adapted versions of the Iowa Gambling Task (Bechara et al., 1994; Kerr and Zelazo, 2004) that require children to make choices about rewards that have immediate or delayed gratification (i.e., receiving a specific amount of a prize). Kerr and Zelazo (2004) examined affective decision making in preschool children using an Iowa Gambling Task for children. Age differences were found between 3- and 4-year-old preschoolers such that 4-year-old children made more advantageous choices across trials compared to 3-year-old children. Crone and van der Molen (2004) examined children's decision-making in a larger age range of children (8–18 years old) and found evidence suggesting that as children aged their awareness of future consequences increased. Furthermore, the youngest group of children evidenced failure of the ability to anticipate future outcomes. Together, evidence from these studies suggest that older children are more likely to demonstrate the ability to delay rewards and make more advantageous decisions than younger children, which may be attributed to differences in brain maturation.

Developmental psychologists have a long-standing interest in the development of prosocial behavior (Eisenberg et al., 1983, 2015), including the notion that parenting behaviors may influence children's prosocial behaviors in early childhood. Sensitive parents

could socialize and model prosocial behaviors for children which, in turn, might influence the development of these behaviors in their children. Alternatively, others suggest that sensitive parents are better able to facilitate children's development of prosocial behaviors by fostering children's awareness of others' needs (for a review, see Eisenberg and Valiente, 2002). Newton et al. (2014) examined associations between school-aged children's parent reported prosocial behavior and observed parent sensitivity using a large longitudinal dataset and found support for a bi-directional relationship between children's prosocial behaviors and maternal sensitivity (but not for paternal sensitivity).

Gender differences have also been examined in relation to children's prosocial behavior, with the findings favoring girls as demonstrating increased sharing behavior and social competence (Burford et al., 1996; Fabes et al., 1999), which might be driven by differences in parental gender socialization. Examining children's prosocial behavior within a forced-choice laboratory paradigm may provide more insight into children's social decision-making and an opportunity to further explore gender effects. Although a few studies have examined children's social decision-making within the context of manipulated social environments (Prencipe and Zelazo, 2005; Leimgruber et al., 2012; Weller and Lagattuta, 2014), to our knowledge, none have examined children's social decision-making in relation to parenting. Exploring parenting as a possible correlate or predictor of children's social decision-making behavior is important because parents play a critical role in children's ability to regulate attention and emotion, which are key aspects of decision-making.

STRESS, MINDFULNESS, AND DECISION-MAKING

Extant research reports that stress negatively affects physical and emotion wellbeing in a wide range of contexts and suggests that stress and decision-making are intertwined. Specifically, stress negatively affects decision-making through its impacts on the underlying neural mechanisms of decision-making (Preston et al., 2007; for review Starcke and Brand, 2012). Findings from this work suggest bidirectional relationships between stress and decision-making, where stress can negatively impact decision-making behavior, but also that specific decisions can elicit a stress response (Wemm and Wulfert, 2017). Much of the research examining the impacts of stress on decision-making has been conducted in adult populations, with a few studies exploring how contextual stress impacts adolescent decision making. Although some empirical work suggests that, among adolescents, increased stress is associated with risky decision making (Galvan and McGlennen, 2011; Johnson et al., 2012), to our knowledge there has been no work examining how stress influences either individual or social decision-making in early childhood.

Individual stress management strategies, such as being mindful in stressful situations, can lessen the effects of stress on physiology and emotion and may be a key factor in supporting decision-making. In childhood, the parent-child relationship plays a significant role in promoting children's optimal development (Hartup, 1989). Parents often help to regulate the child's emotion,

especially in times of stress (Haley and Stansbury, 2003). Warm, consistent caregiving relationships provide the ideal environment for children to develop and refine their emotion regulation capacities and social emotional competence (Cassidy, 1994; Thompson, 1994). Therefore, examining how parenting contributes to the development of children's decision-making skills in early childhood may provide insight into the most effective ways parents can facilitate children's development of critical thinking and problem-solving skills related to decision-making in both individual and social contexts.

MINDFUL PARENTING

Empirical studies suggest that a number of neural and cognitive mechanisms influence the development of decision-making skills; additionally, high-quality relationships with caregivers may further facilitate the development of these skills. Early in life, interactions with parents provide external regulation of emotion and over time children develop independent regulatory capacities that should facilitate decision-making (Thompson and Meyer, 2007). Parents' own ability to control their emotions influences their interactions with their children, and variations in parent emotion regulation are determined by a combination of cognitive, social, physiological, and neurobiological factors (Morris et al., 2007). Parents who are unable to model successful regulation through behavior and parenting practices contribute to emotion regulation difficulties in their children (Rutherford et al., 2015), which may indirectly impact the development of children's decision-making abilities. One promising construct, mindful parenting (Kabat-Zinn and Kabat-Zinn, 1997; Duncan et al., 2009), is posited to underlie parents' own emotion regulation, and thus may be an important predictor of children's emotion regulation and decision-making.

Originally proposed by Kabat-Zinn and Kabat-Zinn (1997), mindful parenting is conceptualized as the practice of being present and aware in everyday interactions with children through paying attention without judgment as each moment unfolds. Duncan et al. (2009) integrated and extended the model of mindful parenting by incorporating the principles of classic mindfulness theory as applied to parent-child relationships. The model includes five dimensions specific to parent-child interactions; (1) listening with full attention, (2) non-judgmental acceptance of self and child, (3) emotional awareness of self and child, (4) self-regulation in the parenting relationship, and (5) compassion for self and child. These dimensions approach parenting in a way that facilitates being present in daily interactions, parenting more calmly, and engaging in increased emotion regulation. As a result, parenting behavior becomes more consistent and responsive over time and parent-child relationships become characterized as more positive, warm, and supportive and filled with less negativity, conflict, and judgment.

Dispositional mindfulness is thought to be a natural way of being mindful in day-to-day life and is associated with improved emotion regulation (Fogarty et al., 2013), improved mental health symptoms (Bravo et al., 2018; Hicks et al., 2018),

and reduced stress (Bergin and Pakenham, 2016). There is growing interest in examining applications of mindfulness in children and parents (Thompson and Gauntlett-Gilbert, 2008; Coatsworth et al., 2010; Semple and Lee, 2014). Much of the existing work examines the role of mindful parenting in adolescent-parent relationships (Duncan, 2007; Geurtzen et al., 2015; Lippold et al., 2015); however, very few studies have examined mindful parenting in parents of younger children (Srivastava et al., 2011; Laurent et al., 2017). Laurent et al. (2017) examined whether mindful parenting was related to both mother and infant physiological responses to stress in the Still Face Paradigm. Results suggested that only mindful parenting (not dispositional mindfulness) was associated with faster cortisol recovery after the stressor for mothers. No significant main effects were identified for mindful parenting on infants' cortisol responses. In a sample of children aged 3–17 years old, an indirect relationship between parent dispositional mindfulness and child internalizing and externalizing problems through mindful parenting and negative parenting practices was found (Parent et al., 2016). This finding aligns with other work suggesting that although both mindful parenting and dispositional mindfulness are positively correlated, only mindful parenting is found to be associated with parenting related constructs like parenting stress. On the other hand, dispositional mindfulness is more closely associated with broader aspects of parents' mental health (Corthorn and Milicic, 2016). Mindful parenting, particularly in early childhood, may enable parents to provide consistent and positive caregiving, which provides the foundation needed to facilitate children's emotion regulation and decision-making skills.

CURRENT STUDY

In the current study, we explored the role of mindful parenting in fostering individual and social decision-making. For the sake of clarity, we use the term "individual decision-making" when the consequences of the decision are only for the individual making it, whereas we use the term "social decision-making" when the consequences also impact another individual (e.g., a friend or stranger), with "prosocial" referring specifically to positive forms of social decision-making behaviors. This study was the first to explore the association between self-reported maternal mindful parenting and observed decision-making behavior in children. First, we examined whether mindful parenting was associated with children's individual decision-making behavior. We hypothesized that children with more mindful mothers would exhibit less observed stress, doubt, and confirmation seeking in a choice task. Second, we hypothesized that maternal mindful parenting would predict children's level of social decision-making behavior in a laboratory administered sharing task. Additionally, age and sex differences in these associations were explored. Given the aforementioned gender differences in prosocial behavior favoring girls, we anticipated that girls would display higher levels of social decision-making. However, we did not have specific hypotheses regarding the extent to which mindful parenting would impact decision-making for girls related to boys.

MATERIALS AND METHODS

Participants and Procedure

Mothers and children were recruited from a community database of interested parents and *via* Facebook advertisements, and were invited to participate in a behavioral study examining child decision-making and sharing (“Choosing & Sharing in Young Children”). A total of 64 mother-child dyads participated in the study. For the purpose of the current study, only those mother-child dyads were included that had usable questionnaire and behavioral data. We excluded one dyad with missing data on the mindful parenting questionnaire, resulting in a total sample of 63 4-to-6-year-olds (child $M_{age} = 5.11$, $SD = 0.88$; 32 girls, 31 boys). Detailed sample characteristics are shown in **Table 1**.

For this project, mother-child dyads were invited to the Tilburg University Life Span Lab. Mothers filled out questionnaires regarding their own and their child’s behavior, and children participated in several behavioral tasks. In the current research, we focus on the association between mother-reported mindful parenting and the child’s behavior on an individual decision-making task (“Choice Task”) and a social decision-making task (“Sharing Task”). All children started with a playful game that involved blowing bubbles to make them feel comfortable before starting the experiment. During the study, at least two researchers were present: a test leader who completed the behavioral tasks with the child, and a second researcher who operated the cameras and filled out an observation form. If any siblings came along, there was a third researcher who played with the siblings. In several families, two or more siblings participated separately in the experimental procedure (13 families participated with two children, one family participated with three children). In this case, the third researcher made sure the siblings did not observe each other performing the tasks. The full procedure was recorded with three cameras from different angles and lasted about 60 min

in total. The study was approved by the ethical review board of Tilburg University and was conducted in full compliance with the Helsinki declaration. All included mothers (and fathers) provided informed consent before participating.

Measures

Maternal Mindful Parenting

The Interpersonal Mindfulness in Parenting Scale Dutch Version (IM-P; Duncan, 2007; de Bruin et al., 2014) was used to measure maternal mindful parenting. The 31-item IM-P assesses five dimensions of mindful parenting: listening with full attention (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”), emotional awareness of self and child (e.g., “I notice how changes in my child’s mood affect my mood”), self-regulation in parenting relations (e.g., “When I’m upset with my child, I notice how I am feeling before I take action”), non-judgmental acceptance of self and child (e.g., “I listen carefully to my child’s ideas, even when I disagree with them”), and compassion for self and child (e.g., “I tend to be hard on myself when I make mistakes as a parent”). An IM-P total score can also be computed from 29 items (excluding two items), as a global indicator of mindful parenting (Duncan, 2007). Items are measured on 5-point scales ranging from 1, *never true*, to 5, *always true*. Because of the low reliability of the subscales, only the IM-P total score was used in study analyses ($\alpha = 0.86$). Since parenting practices can differ between children, mothers completed the questionnaire separately for each child if more than one child participated in the study.

Choice Task

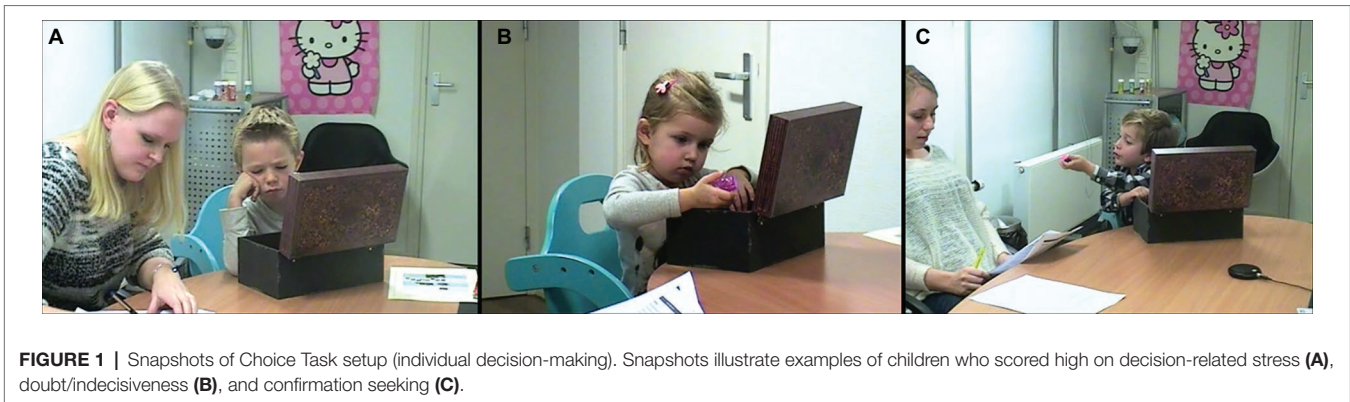
To measure individual decision-making in young children, we developed a task in which children chose from a large assortment of toys under medium pressure. This choice task took place at the end of the study. The children were told they earned a small gift. They were then presented with a wooden treasure chest full of toys (45 total toys: 15 boy toys, 15 girl toys, 15 gender-neutral toys). They were then instructed to open the chest, pick a toy they like the best, and then to close the chest. To induce some choice pressure, it was emphasized that when the child closes the box, they could not change presents anymore. See **Figure 1** for snapshots of the choice task.

A coding system was developed by the authors (**Supplemental Material S1**), based on observations of children performing the choice task. Child behaviors during the choice as were rated based on the coding system by a trained research assistant after the study, using the recordings. The following constructs were coded from the videos: time to decision making, decision-related stress, doubt/indecisiveness, and confirmation seeking. Duration of choosing (in seconds) was measured by timing the number of seconds between opening and closing the chest with a stopwatch. The interclass correlation (ICC) was computed by recoding 25% of the videos by a second rater. In this article we adhere to Cicchetti’s (1994) guidelines for interpreting ICC.

TABLE 1 | Sample characteristics.

Outcome	Value
Children’s age, years	5.11 ± 0.88
Child sex, %	
Female	50.8
Male	49.2
Number of siblings, %	
0	9.5
1	63.5
2	20.6
3 or more	6.4
Children sticker sharing group, %	
Sharing	39.7
Non-sharing	60.3
Mindful parenting score	117.89 ± 9.91
Education parents, %	
General vocational training	14.3
Higher vocational training	52.4
University degree	25.4
Missing	7.9

Values presented as mean ± SD where appropriate.



To assess decision-related stress, videos were coded using a six point scale, ranging from zero to five points: 0 = no signs of stress, 1 = shows light stress (e.g., twisting on the chair), 2 = shows moderate stress (e.g., fingers in mouth, restlessness, light frown), 3 = shows clear stress (e.g., clear restlessness, frowning, tense posture), 4 = shows high stress (e.g., very tense, strong frowning, child indicates to have a hard time), and 5 = shows extreme stress (e.g., contorted face, crying, blushing). The ICC was $r = 0.76$, indicating excellent inter-rater reliability.

To assess doubt/indecisiveness, videos were coded using a six point scale, ranging from zero to five points: 0 = seems to experience no doubt (e.g., directly takes what he/she wants), 1 = seems to experience light doubt (e.g., holds different options in hand, but chooses without trouble), 2 = seems to experience moderate doubt (e.g., holds different options in hand, hesitates and then chooses), 3 = seems to experience clear doubt (e.g., holds different options in hand, puts it back and picks it back up, clearly hesitating), 4 = seems to experience a lot of doubt (e.g., holds numerous options in hand and puts them back or clearly hesitates between two or more options, picks the options back up that were put down, reconsiders almost made decisions, child indicates that he/she is in doubt), and 5 = seems to experience extreme doubt (e.g., persisting doubt, keeps hesitating and keeps reconsidering made decisions). The ICC was $r = 0.89$, indicating excellent inter-rater reliability.

To assess confirmation seeking, videos were coded using a six point scale, ranging from zero to five points: 0 = does not ask for help and does not seem to need it, 1 = lightly asks without talking/not directly, for help (e.g., by looking at the test leader), 2 = asks without talking/not directly for help (e.g., thinking out loud, seeking eye-contact with the test leader), 3 = carefully and directly asks for help (e.g., asking what the test leader prefers), 4 = clear and directly asking for help (e.g., asks if the mother can come to help), and 5 = strongly asks for help (e.g., asks the mother/test leader to choose for them). The ICC was $r = 0.84$, indicating excellent inter-rater reliability. Two cases had to be excluded for the constructs decision-related stress, doubt/indecisiveness, and confirmation seeking due to child compliance problems. More specifically, one child had to go to the bathroom, and a second child could not pick a toy and started crying. Since the latter scenario may be an extreme

case of decision-making disturbance, we included this second case for all subscales but coded him as missing for time.

Sharing Task

To measure child social decision-making (sharing behavior), we used a sharing task in which children had to decide how many stickers to share with a stuffed animal. We adapted the sharing task from Chernyak and Kushnir (2013) and Paulus and Moore (2014). First, the experimenter introduced the child to a stuffed animal (“Konijn,” Dutch for Bunny). Then the experimenter took two small trays and gave one of the trays to Konijn and the other to the child. Participants were then told that Konijn was a sweet bunny and that he had five stickers that he wanted to share with the child. Children then received the five stickers and were told that they could decide how many of the stickers they wanted to share with Konijn by placing the stickers either in Konijn’s tray or in their own tray. The number of stickers in Konijn’s tray was used as measure for sharing. Before the experiment started, children were asked to point to their own tray and to Konijn’s tray as a final check. We used five stickers to force children to create an uneven distribution [i.e., either to prioritize themselves or to prioritize Konijn, Chernyak and Kushnir (2013) used three stickers instead of five]. Children were divided in two groups: a “high-sharing” group (majority of stickers given to Konijn – usually 3) and “low-sharing” group (majority of stickers kept to themselves – usually 2 given to Konijn and occasionally only 1). See **Figure 2** for a snapshot of the sharing task.

Covariates

Several covariates were measured and included into subsequent statistical models, including age and sex of the child, socioeconomic status (SES) of the family, and education level of the mother. Mothers reported these via a questionnaire. SES was assessed via averaging responses (1 = never, 3 = always) to the following three items: “In the past year, did you have problems at the end of the month paying your fixed costs (for example, rent, groceries, and utilities)?”, “In the past year, did you worry about your financial situation?”, and “In the past year, did you have to borrow money from friends or family?”. SES was examined as a covariate because children from households with lower SES may struggle with developmental



FIGURE 2 | Snapshot of Sharing Task setup (social decision-making). The child was first introduced to a stuffed animal (“Konijn,” Dutch for Bunny). Konijn has five stickers that he wants to share with the child. Subsequently, the child is asked to decide how many stickers Konijn gets and how many he/she want to keep. Two small trays were placed in front of the child, one for Konijn and one for the child.

competences, including emotion regulation and decision-making, due to the experience of poverty-related stressors (Raver, 2004).

Statistical Approach

First, inter-correlations between the different measures of decision-making in the Choice Task were computed with Pearson’s correlations. Next, we examined whether maternal mindful parenting was associated with measures of individual decision-making (i.e., time, decision-related stress, doubt/indecisiveness, and confirmation seeking) by running four hierarchical regression models, one model per construct. The first step of the hierarchical regression model contained the maternal mindful parenting score. In the next step, the covariates (i.e., child age, child sex, number of siblings, SES, and maternal education level) were added. The last step contained a sex interaction. Significant sex interactions were followed up with simple effects tests.

To examine the association between maternal mindful parenting and child sharing behavior, we categorized children into groups based on their sharing behavior. Because most children either gave two or three stickers to Konijn (only one child gave one sticker, none of the children gave four or more stickers), we computed a binary variable for sharing. Subsequently, we ran a hierarchical (binary) logistic regression model with the same steps as the above described hierarchical regression model, but with sharing group as the dependent variable. All analyses were performed in SPSS Statistics 22 (IBM, 2013), and a p threshold of 0.05 was used for significance testing.

RESULTS

Child Individual Decision-Making

The four measures (i.e., time, decision-related stress, doubt/indecisiveness, and confirmation seeking) showed high, positive

TABLE 2 | The inter-correlations between the four measures of the choice task: time, decision-related stress, doubt/indecisiveness, and confirmation seeking.

	Time (s)	Decision-related stress	Doubt/indecisiveness	Confirmation seeking
Time (s)	–	0.76*	0.82*	0.60*
Decision-related stress		–	0.71*	0.43*
Doubt/indecisiveness			–	0.65*
Confirmation seeking				–

*Correlation is significant at the $p < 0.01$ level.

inter-correlations (Table 2). We found no sex differences on any measures of individual decision-making. Strong effects were found for child’s age for time ($r = 0.30$, $p = 0.021$), decision-related stress ($r = 0.38$, $p = 0.003$), and doubt/indecisiveness ($r = 0.40$, $p = 0.002$), indicating that older children experienced more difficulty with this individual decision-making process than younger children.

No main effect of mindful parenting was found for any of the individual decision-making measures (time: $F = -0.554$, $p = 0.582$; decision-related stress: $F = -0.949$, $p = 0.347$; doubt/indecisiveness: $F = -0.703$, $p = 0.485$; confirmation seeking: $F = -1.103$, $p = 0.275$). Effects remained non-significant after controlling for covariates. We did find trending interactions with sex for doubt/indecisiveness ($t = 1.95$, $p = 0.057$) and confirmation seeking ($t = -2.06$, $p = 0.058$). However, when controlling for covariates, these interactions became non-significant. No significant interactions with child age were found for any of the constructs (time: $F = 0.442$, $p = 0.661$; decision-related stress: $F = 0.594$, $p = 0.555$; doubt/indecisiveness: $F = 0.469$, $p = 0.641$; confirmation seeking: $F = 1.101$, $p = 0.276$).

Child Social Decision-Making

In the current sample, most children were included in the “low-sharing” group ($n = 38$, 60.3%) versus the “high-sharing” group ($n = 25$, 39.7%). We found no sex differences in sharing group membership ($\chi^2 = 0.21$, $p = 0.648$), and children in the “low-sharing” group did not significantly differ in age from those in the “high-sharing” group ($t = -1.47$, $p = 0.147$).

Maternal mindful parenting significantly predicted sharing behavior [$Wald = 4.82$, $p = 0.028$; $\text{Exp}(B) = 1.067$ (95% CI = 1.007–1.131)]. Even after controlling for covariates (child age, sex, SES, maternal education level) the association remained significant [$Wald = 4.51$, $p = 0.034$; $\text{Exp}(B) = 1.066$ (95% CI = 1.005–1.131)]. Children who were exposed to higher levels of maternal mindful parenting shared significantly more stickers with the stuffed animal than children exposed to lower levels of maternal mindful parenting. We did not find significant sex ($Wald = 0.247$, $p = 0.619$) or age ($Wald = 0.281$, $p = 0.596$) interactions.

DISCUSSION

The purpose of the current study was to investigate associations between maternal mindful parenting and preschool children’s

individual and social decision-making. Although the empirical research concerning mindful parenting is growing, few studies have specifically focused on mindful parenting and associations with preschool children's development. To the best of our knowledge, this study is the first to test associations between mindful parenting and young children's decision-making behavior.

Mindful Parenting and Individual Decision-Making

Primary analyses examining mindful parenting and behavioral indicators of children's decision-making behavior indicated no significant main effects for maternal mindful parenting on children's time to decision-making or on children's decision-related stress, doubt, and confirmation seeking. One possible explanation for the null findings in the current study related to mindful parenting and individual decision making is that the individual decision-making choice task and the behaviors coded from this task may not have adequately tapped into processes that would be influenced by the parent-child relationship broadly or mindful parenting specifically. Another possibility is that individual decision-making is not as strongly related to mindful parenting because other aspects of children's social context and individual differences in children's temperament and personality play more important roles in fostering choice-related individual decision-making.

Notably, correlations between study variables of interest identified strong child age effects on children's decision-making time, decision-related stress, and doubt/indecisiveness. Older children spent more time deciding between choices on the laboratory choice task and exhibited greater decision-related stress and doubt compared to younger children. Since analyses were only correlational, it is difficult to draw causal inferences for why this may be; however, one possible explanation for this association could be that older children's cognitive capacities are more developed allowing them to think critically about the risks and benefits for choosing one toy over another. Additionally, taking time to examine each possible choice may have also led to delayed time to decision-making as well as doubtfulness. Future studies with larger samples should investigate if there is an interaction between decision-making, child age and mindful parenting. More specifically, research across a broader age range could examine whether there are differential effects of mindful parenting on individual decision-making behavior in younger versus older children.

Mindful Parenting and Social Decision-Making

Next, we examined the relationship between mindful parenting and children's social decision-making. Maternal mindful parenting predicted child prosocial decision-making behavior during a sharing task even after controlling for demographic factors such as child age, sex, SES, and maternal education level. Children with more mindful mothers were more likely to engage in sharing behavior than those with mothers who were low in mindful parenting, which is noteworthy because prosocial sharing behavior is a normative developmental attainment of

the preschool years (Paulus and Moore, 2014). Therefore, identifying a contextual factor that seems to influence the extent to which young children share with others suggests that programs to promote parents' mindful parenting could provide tangible benefits to young children's early social development. Related to this idea, one possible explanation for the observed association between mindful parenting and social decision-making is that parents higher in mindful parenting model and emphasize prosocial behaviors in daily interactions with children. Another possibility is that mindful parenting contributes to parental positivity and less punitive discipline, both of which have been found to be associated with increased prosocial behaviors in young children (Knafo and Plomin, 2006). Future research should investigate whether there are specific domains from Duncan et al.'s (2009) model of mindful parenting that are more predictive of children's prosocial decision-making than others. Unfortunately, this research question was not pursued in the current study due to low internal reliability of mindful parenting subscales.

Study Limitations, Future Directions, and Implications

The current study is not without a few important limitations. First, the cross-sectional design means that we cannot draw firm causal inferences about the direct effects in analyses of mindful parenting and children's decision-making. Future studies could investigate changes in child decision-making after a mindful parenting intervention, which would increase understanding of the extent to which mindful parenting precedes and facilitates child decision-making.

Second, the current study included preschool aged children ranging from ages 4 to 6 years old; this broad age range may have contributed to some of the variability found in both the individual decision-making and social decision-making tasks. Future studies should consider comparisons between specific age groups to better understand how developmental differences across early childhood may be associated with decision-making.

Third, methodological limitations may have contributed to the pattern of findings. From a methodological perspective, our null finding related to individual decision-making may be related to the choice task used to assess individual decision-making. Because the choice task was newly developed for this study, it may be that the paradigm taps into multiple constructs including both individual decision-making as well as other related constructs such as impulsivity. Also, the use of self-report measures to assess mindful parenting introduces the possibility that results may be impacted by rater bias. Preliminary work has explored using observational ratings of parent-child interaction concurrently with self-reported mindful parenting (Duncan et al., 2015), which may be a useful methodological approach for future studies to corroborate self-reports of mindful parenting.

Fourth, this study did not consider additional parenting factors and individual child characteristics that may play an important role in the development of decision-making. Therefore, future studies should assess mindful parenting in concordance with other parenting constructs such as warmth and hostility

as well as developmental assessments of children's executive function, inhibitory control, and other early competencies that could promote decision-making. Furthermore, only the mindful parenting of the mother is considered in this study. Some research posits that fathers (or other co-parents) impart a specific and important effect on child development, including prosocial behavior (Gryczkowski et al., 2018). Therefore, future studies should include co-parents to further understand the role of the family context in promoting children's decision-making skills.

Fifth, the study's small sample size puts limitations on power and the types of analyses that could be used to test the research questions. Furthermore, the homogenous sample, which may have been compounded by including siblings from 14 families, limits the generalizability of the current study findings and highlights the need to include more diverse samples as people within different cultures may value decision-making differently. Finally, participants self-selected into the study which may increase bias due to potential increased interest in the subject matter compared to the general population.

As stress and emotional regulation are believed to contribute to the ability to make decisions, future studies should take a biopsychosocial approach when addressing these research questions. For example, one may consider actual physiological stress responses using measurements of cortisol or respiratory sinus arrhythmia throughout the choice and sharing tasks. In addition, considering contextual factors that may play a role in the stress response, such as environmental chaos (Lepore et al., 2010), may provide important insights into socio-ecological risk factors that could contribute to poor decision making.

In summary, findings from the current study suggest that mindful parenting may play an important role in the development of children's prosocial decision-making. Future research should investigate how this association unfolds over time while also examining developmental outcomes associated with prosocial decision-making during early childhood. For example, early prosocial decision-making could foster successful adaptation across the school transition, which fits with evidence that social competence is a key indicator of school adjustment (Curby et al., 2008). Our findings also add to the growing evidence

that parents' use of mindfulness during caregiving should be incorporated into early preventive intervention programs, particularly programs designed to foster children's early social skills including sharing behavior and prosocial decision-making (Schonert-Reichl et al., 2012). By providing mindful parenting programs early on, it may improve not only the child's ability to navigate difficulty but also the parent's ability to regulate their own emotion, thereby embodying the attributes that can then be taught to the child.

DATA AVAILABILITY

The datasets generated for this study are available on request to the corresponding author.

AUTHOR CONTRIBUTIONS

KW and LH contributed to the writing of the manuscript, interpretation of results, and review of the final version of the manuscript. TS contributed to the design of study, data collection, and review of the final version of the manuscript. CT contributed to the review of the earlier versions of the manuscript, data analyses, and review of the final version of the manuscript. TH contributed to the literature search, data analyses, construction of tables, and review of the final version of the manuscript. MZ contributed to funding of the study, study design, interpretation of results, and review of the final version of the manuscript. MH contributed to the study design, data collection, data analyses, interpretation of results, and review of the earlier and final versions of the manuscript.

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpsyg.2019.00550/full#supplementary-material>

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The Role of Experiential Avoidance and Parental Control in the Association Between Parent and Child Anxiety

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Parenting behavior and practices contribute to the intergenerational relationship between parent and child anxiety, with parental control being a consistent predictor of child anxiety. Parental experiential avoidance refers to how a parent copes with their internal world in the context of parenting. Little is known about how this relatively new parenting concept relates to child anxiety. The current study tested the indirect effect of parent anxiety on child anxiety through parental control and parental experiential avoidance; the indirect effect of parent anxiety on parental control through parental experiential avoidance; and the moderating effect of parental experiential avoidance on the relationship between parental control and child anxiety. Using a cross-sectional design, parents ($N = 85$) from a community sample of 8–12-year-old children self-reported on a survey measuring parent anxiety, child anxiety, parental control, and parental experiential avoidance. A hierarchical regression indicated that parental experiential avoidance significantly predicted child anxiety and accounted for further variance in child anxiety, over, and above parental control. There was an indirect effect of parent anxiety on child anxiety through parental control and parental experiential avoidance. Parental experiential avoidance moderated the relationship between parental control and child anxiety, such that the relationship was only significant at high levels of parental experiential avoidance. The current study provides support for the role of parental experiential avoidance in an intergenerational understanding of anxiety. Future research should replicate the study with a clinical sample. Theoretical and practice implications are considered.

Keywords: parent, child, anxiety, parental control, experiential avoidance

INTRODUCTION

Fear, worry, and anxiety are common during childhood and for most children occur as part of normal development. However, for some children anxiety symptoms become worse over time and interfere with daily routine and interpersonal functioning (Breinholst et al., 2012). Anxiety has been found to be one of the most common psychiatric problems in children and adolescents (Costello et al., 2005) and Beesdo et al. (2009) reported a prevalence of up to 15–20% of children experience

some level of anxiety at one time. Children have been found to experience anxiety at all stages of childhood; however, middle childhood (8–12 years) is a common time for children to present to services with anxiety.

Research has consistently identified that parental anxiety is a risk factor for childhood anxiety (Donovan and Spence, 2000); children of parents who have an anxiety disorder are five to seven times more likely to be diagnosed with an anxiety disorder themselves compared to children of parents who do not have an anxiety disorder (Beidel and Turner, 1997). The co-occurrence of parental and child anxiety has led many researchers to suggest that anxiety is transmitted from parent to child (Remmerswaal et al., 2015). Burnstein and Ginsburg (2010) suggested that this transmission is partially genetic; with genetic heritability accounting for approximately 50% of the variance in children having an anxious disposition (Eley and Gregory, 2004). The heredity of anxiety disorders, more specifically, is estimated to be lower (Kendler et al., 1992). Given that genetic heredity cannot account for all the variance in child anxiety, previous research has also explored the influence of parental characteristics such as parental attachment (Brumariu and Kerns, 2010) and parenting style (Waite et al., 2014), as explanatory factors.

Craske's (1999) model of anxiety development postulates that parenting style provides an environmental context that can influence the development and maintenance of anxiety. For example, a relationship between child anxiety and high levels of parental rejection and parental control has been found (Bögels and Brechman-Toussant, 2006; van der Sluis et al., 2015). Several systematic literature reviews indicate that high levels of control in parenting is the most consistent parenting predictor of anxiety in childhood (Ballash et al., 2006; McLeod et al., 2007; Murray et al., 2009), accounting for around 6% of the variance in child anxiety (McLeod et al., 2007).

Parental control is characterized by excessive monitoring of their children's activities, discouragement of independent thinking and high levels of intrusion (Bögels and Brechman-Toussant, 2006). Traditionally, parental control has been defined both in terms of behavioral control and psychological control of the child (Barber, 1996). Parental control of the child's behavior can involve imposition of structure, expectations and contingencies; whereas psychological control refers to a pattern of manipulating and restricting the child's emotional experience. With this classical distinction, previous literature has indicated that mothers of anxious-withdrawn children are both more behaviorally and psychologically controlling than mothers of average children (Mills and Rubin, 1998). Within inter-generational theories of child anxiety development, the idea of behavioral and psychological control are combined in relation to parental rearing behavior, with parental control defined as parental behavior that limits or threatens the child's autonomy (Grusec and Davidov, 2007). Parental control may take the form of both psychological or behavioral in nature, with the aim of constraining the child's cognition and emotion (Borelli et al., 2015). In their meta-analysis, McLeod et al. (2007) classified parental control into two subdimensions. The first, over-involvement was defined by parent interference with normative autonomy of the child, excessive restriction, and encouragement

of dependence. The second subdimension was low autonomy granting, which referred to parental discouragement of the child's opinions and input in decision-making. Collectively, over-involvement and autonomy granting accounted for the largest proportion of variance in child anxiety compared to other parenting factors, such as warmth. McLeod et al. (2007) reported a larger effect size in the relationship between child anxiety and parental (low) autonomy granting (0.42) in comparison to parental over-involvement (0.23). In this sense, parental control has been viewed as parental overprotection and low autonomy granting (Ollendick and Grills, 2016). Chorpita and Barlow (1998) suggest that parental control can lead to a vulnerability to child anxiety due to a reduction in the child's development of autonomy. Barlow's (2002) model of anxiety development suggests that perceived lack of external and internal control is an important attribute in the development of anxiety for both adults and children. Consistent with this theoretical assertion, Thirlwall and Creswell (2010) reported that children experienced greater levels of anxiety when their parents behaved in controlling ways, compared to autonomy granting ways.

Despite the consistent link between parental control and child anxiety (Murray et al., 2009), the link between parent anxiety and parental control is less clear. There is empirical support for a link between parent anxiety and controlling parenting behavior (Whaley et al., 1999), but in a meta-analytic review of 23 studies, van der Bruggen et al. (2008) reported a non-significant relationship between parent anxiety and parental control. Further, Turner et al. (2003) found no difference between anxious and non-anxious parents in levels of parental control. Therefore, there is inconsistent evidence that parents who experience higher levels of anxiety will be more likely to engage in controlling behaviors.

More recently, researchers have investigated whether parental control is a mechanism that could explain the relationship between parent and child anxiety, with mixed results. Affrunti and Woodruff-Borden (2015) did not find that parental control mediated the relationship between parent and child anxiety. Conversely, Borelli et al. (2015) found that maternal control mediated the relationship between maternal anxiety and child anxiety; however, paternal control was not found to mediate the relationship between paternal anxiety and child anxiety. One possible explanation for the inconsistent finding, may be that there is another parenting factor unaccounted for within this relationship. Tiwari et al. (2008) postulated that parents may engage in controlling behaviors as a means of avoiding their own internal distress; in this sense, parental control is viewed as a manifestation of parental experiential avoidance.

Experiential avoidance refers to the inability or unwillingness to remain in contact with one's own internal distress (Heckler, 2012, Unpublished). In finding ways of regulating emotional distress, one may engage in behaviors or strategies to suppress, avoid or escape these feelings. Experiential avoidance has been found to be important in both the development and maintenance of anxiety in both adults and children (Simon and Verboon, 2016). Given that anxious adults are likely to engage in experiential avoidance (Barman et al., 2010); it follows that

parents who are anxious may also engage in parenting specific experiential avoidance.

An anxious parent may deal with difficult parenting experiences that lead to their own internal distress by avoiding, suppressing, or controlling (Tiwari et al., 2008) as a means to relieve their own distress. One response may be to intervene, for example, by removing their child from the situation. Subsequently, the child is not afforded the opportunity to engage in ‘trial and error’ learning which leads to the development of self-efficacy (Cartwright-Hatton et al., 2010), and so may become vulnerable to anxiety. Consistent with this supposition, Hudson et al. (2008) reported that mothers of anxious children behaved intrusively when their child displayed negative emotions, compared to when the child displayed positive emotions. The authors suggest that parents may have felt uncomfortable when their child expressed negative affect and because of this, were driven to behave in controlling ways to reduce their own discomfort as well as their child’s negative emotions.

To date, only one study has examined the relationship between parental experiential avoidance and child anxiety; Cheron et al. (2009) reported that parental experiential avoidance was significantly associated with high levels of child anxiety in a sample of children with anxiety disorder. In addition, parents who reported high levels of experiential avoidance in their daily lives, also reported high levels of experiential avoidance in their parenting style and were more likely to experience anxiety themselves.

The current study aimed to examine the predictive relationships between child anxiety and two theoretically related parenting factors: parental control and parental experiential avoidance and to explore these parenting dimensions within the relationship between parent and child anxiety. Given inconsistencies reported in previous research, two clear objectives were to (i) investigate the indirect effect of parent anxiety on child anxiety through parental control and parental experiential avoidance and (ii) the indirect effect of parent anxiety on parental control through parental experiential avoidance. Finally, we aimed to investigate if the relationship between parental control and child anxiety would be moderated by parental experiential avoidance.

MATERIALS AND METHODS

Participants

Parents of children aged between 8 and 12 years, who were the main caregiver and had sufficient proficiency in English, were invited to take part in the study. A total of 120 questionnaires were distributed to a community sample; 85 parents returned completed measures. The sample of participants comprised 12 fathers and 73 mothers, who reported on their children (38 boys, 47 girls) with a mean age of 9.83 years ($SD = 1.28$). The majority of the sample of participants identified themselves as White British (80%); the remaining participants identified as either Irish (2.4%), American (2.4%), Asian (1.2%), black Caribbean (3.5%), Indian (2.4%), black British (3.5%), white European (3.5%) or did not specify (1.2%). No participants were below 25 years in

age; 9.4% of parents were between ages 26–35, 61.2% of parents were between ages 36–45 and 29.4% of parents were over 46. Parents reported a range in average annual household income; 11.8% reported less than £20,000, 7.1% reported £20–30,000, 17.7% reported £30–50,000, 32.9% reported £50–70,000, 16.5% reported £70–100,000 and 14.1% reported over £100,000.

Procedure

The study protocol was approved by the National Health Service, United Kingdom, research ethics committee. Study advertisements were distributed to four local primary schools and two community groups, and directed parents to collect a paper version of the study information sheet and questionnaire from the reception area if they were interested in participating. Participants completed questionnaires at their leisure, and returned completed questionnaires in a sealable envelope (provided with the questionnaire pack) via a dedicated covered box left in the respective reception area. Anonymity was retained; participants were not required to provide any personally identifying information about themselves or their child. The return of questionnaires was considered as implied consent.

Participants with more than one child between 8 and 12 years were instructed to base their responses on the child whose age was closest to the mid-range (i.e., 10 years). Parents with children who were the same age (i.e., twins), were asked to bring one of their children to mind when completing the questionnaire.

Measures

Parent Rated Child Anxiety Symptoms

The symptoms were measured using the Spence Children’s Anxiety Scale, Parents Version (SCAS-P; Spence, 1998). The SCAS-P is a 39-item parent-report measure, which generates total scores and subscale scores in accordance with DSM-IV (American Psychiatric Association [APA], 2000) anxiety disorder clusters. Participants rated the degree to which their child experiences each symptom (e.g., “my child complains of feeling afraid”) on a four-point Likert scale, from never (0) to always (3). Total scores range from 0 to 114; higher scores indicated higher levels of child anxiety. Norms for mean total scores of children with an anxiety disorder range from 30.1 ($SD: 14.9$) to 33.0 ($SD: 14.9$) and in the community sample, norm mean total scores range from 11.8 ($SD: 8.3$) to 16.0 ($SD: 11.6$) in children aged between 6 and 18 years (Nauta et al., 2004). The SCAS-P has demonstrated good validity and reliability with an overall Cronbach’s alpha coefficient of 0.89 and consistency has been found between child and parent versions. In the current study, the Cronbach’s alpha coefficient was 0.96.

Parent Anxiety Symptoms

The symptoms were measured using the State Trait Anxiety Inventory (STAI, Spielberger et al., 1983). The STAI is a 40-item self-report questionnaire, which includes two subscales measuring both state and trait levels of anxiety. For the purpose of this study, the trait subscale was used to measure parent’s anxiety, as an indicator of more enduring levels of anxiety. The trait anxiety subscale has 20 items referring to symptoms of

anxiety (e.g., “I feel nervous and restless”); participants indicated how often they experience each symptom on a four-point Likert scale from 1 (almost never) to 4 (almost always). A total trait anxiety score was obtained by summing scores on the 20-items. Total scores range from 20 to 80; higher scores indicate greater levels of trait anxiety. Clinical cut-off scores have not yet been defined. However, in a sample of parents with an anxiety disorder, Teetsel et al. (2014) reported the mean total score for mothers to be 49.82 (*SD*: 8.29) and for fathers to be 49.81 (*SD*: 9.16). The STAI correlates highly with other measures of adult anxiety and has shown good test–retest reliability in other samples ($r = 0.73$ to $r = 0.85$; Spielberger et al., 1983). In the current study, the Cronbach’s alpha coefficient was 0.95.

Parental Control

It was measured using The University of Southern California Parental Control Scale (USC-POS, Borelli and Margolin, 2013, Unpublished). The USC-POS is a 10-item scale designed to measure behavioral, affective and cognitive aspects of parental control and child autonomy restriction (an example of a cognitive aspect assessed, “I expect my child to tell me what happens when he/she is away from home”; example of a behavioral aspect “When I am disappointed or irritated with my child, I withhold affection”; example of a parental behavior aimed at constraining their child’s thought and feelings, “I do not allow my child to get angry with me”). Participants rated each item according to how well it described their parenting, on a five-point Likert scale from 0 (not at all descriptive) to 4 (extremely descriptive). Total scores can range from 0 to 40; higher scores indicating higher levels of control used in parenting. The USC-POS has demonstrated good internal consistency ($\alpha = 0.81$) and validity. In the current study, the Cronbach’s alpha coefficient was 0.88.

Experiential Avoidance in Parenting

It was measured using the Parental Acceptance and Action Questionnaire (PAAQ, Cheron et al., 2009). The PAAQ is a 15-item self-report measure of parent’s willingness to witness their child experiencing distress, as well as a parent’s ability to manage their reaction to their child’s distress. Item statements (e.g., “worries can get in the way of my child’s success”) were rated by participants on a seven-point Likert scale ranging from 1 (never true) to 7 (always true). Total scores can range from 15 to 105; higher scores indicate a higher degree of parental experiential avoidance. The PAAQ has demonstrated moderate internal consistency ($\alpha = 0.64$ – 0.65) and moderate test re-test reliability ($\alpha = 0.68$ – 0.74). In the current study, the Cronbach’s alpha coefficient was 0.83.

Data Analyses

An *a priori* power calculation was undertaken for multiple regression analysis. Assuming a medium effect size of $R^2 = 0.15$, a significance level of $\alpha = 0.05$, and four predictor variables, a sample size of 85 participants was required to achieve 80% power.

Independent *t*-tests using bootstrapping procedures with 1000 re-samples and the bias corrected confidence interval were conducted to test for differences in parent and child gender for all measured variables. Any significant differences found in

gender mean scores, were controlled for in further analysis as a covariate. As assumptions in linearity of the data could not be assumed, Spearman’s Rho correlations were conducted to test the associations between variables. Hierarchical regression analyses were performed to examine the amount of variance in child anxiety could be explained by the parenting variables. Bootstrapping tests with 1000 re-samples and the bias corrected confidence interval were performed and variables were entered into the regression model using a forced entry method.

Mediation and moderation analyses were performed using model 4 of the PROCESS macro (Hayes, 2013) for the Statistical Package for Social Sciences (SPSS). To examine indirect effects, the paths from the predictor variable to the mediator(s) (path a), the mediator(s) to the outcome variable (path b) and the predictor variable to the outcome variable (path c) were inspected for significance. If the path between the predictor variable and the outcome variable (path c’) became non-significant when controlling for mediating variable(s), a mediation effect was indicated. If this occurred, as recommended by Preacher and Hayes (2004) bootstrapping procedures were applied with 5000 re-samples and the bias corrected confidence interval to establish whether indirect effects through individual potential mediator(s) were significant.

For moderation, the interaction between parental control and parental experiential avoidance (step 4) was added to the initial hierarchical regression analysis. The contribution of the interaction term in predicting child anxiety was assessed by inspection of R^2_{change} , along with accompanying *F* statistic and *p*-value (<0.05 indicated significance). If potential moderation (significant interaction term) was indicated, then regression analysis on the centered terms was conducted using the PROCESS macro; bootstrapped data (5000 re-samples) were inspected and plotted, to assess the conditional effect of parental control on child anxiety, under high and low values of parental experiential avoidance.

RESULTS

Data Screening

Confident assumptions of normality, linearity, and homoscedasticity could not be made for all variables. Multicollinearity was not deemed to be problematic. Violations of normality are generally not considered to be highly problematic within bootstrapping procedures, with regression analyses being robust to violations (Tabachnick and Fidell, 2013). Three individual item scores (0.04%) across the dataset were missing; these were replaced with the participant’s mean score on that measure. No outliers were indicated as influencing the overall findings. An inspection of STAI scores showed that 16 participants (19%) scored above, and 27 (32%) participants scored within one standard deviation above and below clinical norm mean scores (Teetsel et al., 2014). Inspection of the SCAS-P scores showed that 12 participants (14%) reported their child to score over the clinical norm mean score, and a total of 44 participants scored their child within one standard deviation

above and below the mean norm score for clinical levels of anxiety (Nauta et al., 2004).

Preliminary Analyses

Significantly higher child anxiety scores were observed for boys ($M = 27.18$, $SD = 22.50$) compared to girls ($M = 14.47$, $SD = 11.93$), $t(53.51) = 2.90$, $p < 0.005$, with a small effect size ($d = 0.14$). Child gender was subsequently controlled for as a covariate in subsequent regression and mediation analyses. No significant differences were observed between mothers and fathers on parent anxiety score, parental control, and parental experiential avoidance ($p > 0.05$). Means and standard deviations for each of the measures are reported in **Table 1**.

Correlation Analyses

A significant moderate correlation was observed between parent and child anxiety scores; parents who reported high levels of anxiety, also reported that their child experienced high levels of anxiety. A significant moderate correlation was observed between parental experiential avoidance and child anxiety; parents who reported high levels of experiential avoidance, also reported that their child experienced high levels of anxiety. Correlation coefficients are reported in **Table 1**.

Regression Analyses

Results from the regression analysis are reported in **Table 2**. In block one, child gender and parent anxiety (STAI) explained 58% of the variance in child anxiety (SCAS-P), $R^2 = 0.58$, $R^2_{Adjusted} = 0.57$, $F(2,82) = 56.97$, $p < 0.001$, with parent anxiety explaining a significant amount of the variance. The addition of parental control at block two explained a further 7% of the variance in child anxiety, $\Delta R^2 = 0.07$, $R^2_{Adjusted} = 0.64$, $F(3,81) = 50.84$, $p < 0.001$, making a significant contribution to the model. The addition of experiential avoidance at block three explained a further 2% of the variance in child anxiety, $\Delta R^2 = 0.2$, $R^2_{Adjusted} = 0.66$, $F(4,80) = 41.20$, $p < 0.001$, with parental experiential avoidance making a significant contribution to the

variance. Thus the final model predicted 67% of the total variance in child anxiety. Parental control remained a significant predictor at block 3, with a reduction in beta value observed. Parent anxiety remained a significant predictor within each block and the final model, explaining the greatest proportion of variance in child anxiety, although with a decreasing beta size observed.

Indirect Effects of Parent Anxiety on Child Anxiety Through Parenting Factors

The first mediation model assessed the indirect effects of parent anxiety (IV) on child anxiety (DV) via the two parenting factors, parental control, and experiential avoidance (MV). Parent anxiety was a significant predictor of parental control (path a), $\beta = 0.41$, $SE = 0.04$, $p < 0.001$, and parental experiential avoidance, $\beta = 0.74$, $SE = 0.09$, $p < 0.001$. Parental control was a significant predictor of child anxiety (path b), $\beta = 0.69$, $SE = 0.29$, $p = 0.019$. Parental experiential avoidance was a significant predictor of child anxiety ($\beta = 0.29$, $SE = 0.13$, $p = 0.028$). Parent anxiety continued to be a significant predictor of child anxiety (path c'), $\beta = 0.65$, $SE = 0.14$, $p < 0.001$. Bootstrapping procedures indicated that the indirect effects of parental control ($\beta = 0.28$, 95% BCa CI [0.03, 0.61]), and parental experiential avoidance ($\beta = 0.22$, 95% BCa CI [0.05, 0.39]), were significant. See **Figure 1**.

The second mediation model assessed the indirect effects of parent anxiety (IV) on parental control (DV) via parental experiential avoidance (MV). Parent anxiety was a significant predictor of parental experiential avoidance (path a), $\beta = 0.74$, $SE = 0.09$, $p < 0.001$. Parental experiential avoidance was a significant predictor of parental control, $\beta = 0.24$, $SE = 0.04$, $p < 0.001$ (path b). Parent anxiety continued to be a significant predictor of parental control (path c'), $\beta = 0.23$, $SE = 0.05$, $p < 0.001$. Bootstrapping procedures indicated that the indirect effect of parental experiential avoidance, $\beta = 0.18$, 95% BCa CI [0.10, 0.25], was significant. See **Figure 2**.

Parental Experiential Avoidance Moderates Relationship Between Parental Control and Child Anxiety

The addition of the interaction term, parental control x parental experiential avoidance, to the hierarchical regression predicting child anxiety (step 4), resulted in a significant amount of additional variance explained, $\Delta R^2 = 0.03$, $R^2_{Adjusted} = 0.68$, $\Delta F(5,79) = 6.57$, $p = 0.012$. Data for conditional effects of parental control at values of parental experiential avoidance indicated that at low values of parental experiential avoidance the relationship between parental control and child anxiety is non-significant; at high values of parental experiential avoidance, the relationship between parental control and child anxiety is significant. Examination of the interaction plot (see **Figure 3**) confirmed an enhancing effect; as parental experiential avoidance and control increased, so child anxiety increased. At low parental experiential avoidance, child anxiety was similar for low, average, or high levels of parental control. Those parents reporting high levels of parental experiential avoidance and high levels of parental control, also reported the highest levels of child anxiety.

TABLE 1 | Descriptive statistics and Spearman's Rho correlation coefficients for all primary measures ($N = 85$).

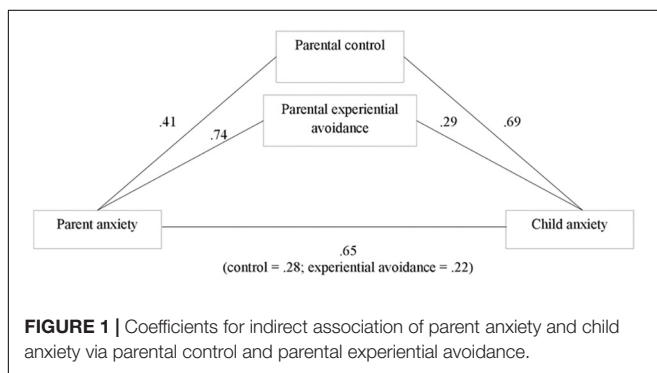
Variable ($n = 85$)	1	2	3	4
(1) Parental anxiety (STAI)	–			
(2) Child anxiety (SCAS-P)	0.51**	–		
(3) Parent control (USC-POS)	0.48**	0.43**	–	
(4) Parent experiential avoidance (PAAQ)	0.46**	0.54**	0.61**	–
Range	22–75	0–76	1–31	21–89
M (SD)	39.27 (12.07)	20.71 (18.31)	8.88 (6.85)	50.88 (13.72)

** $p < 0.001$.

TABLE 2 | Summary of regression analysis predicting child anxiety from child gender and parental anxiety (step 1); parental control (step 2); parental experiential avoidance (step 3).

Block	Variable	B	SE(B)	β	Confidence intervals	
					Lower	Upper
1	Child gender	-0.54	2.85	-0.02	-5.95	4.57
	Parent anxiety	1.15	0.15	0.76***	0.81	1.37
2	Child gender	-0.62	2.53	-0.02	-5.34	3.86
	Parent anxiety	0.72	0.16	0.48***	0.43	0.99
	Parent control	1.03	0.27	0.39***	0.53	1.56
3	Child gender	-0.58	2.49	-0.02	-5.23	4.05
	Parent anxiety	0.65	0.16	0.43***	0.34	0.93
	Parent control	0.69	0.31	0.26*	0.13	1.26
	Experiential avoidance	0.29	0.11	0.22*	0.05	0.52

$N = 85$. Block 1 $R^2 = 0.58^{***}$, Block 2 $\Delta R^2 = 0.07^{***}$, Block 3 $\text{var}\Delta R^2 = 0.02^{***}$. * $p < 0.05$, *** $p < 0.001$.



DISCUSSION

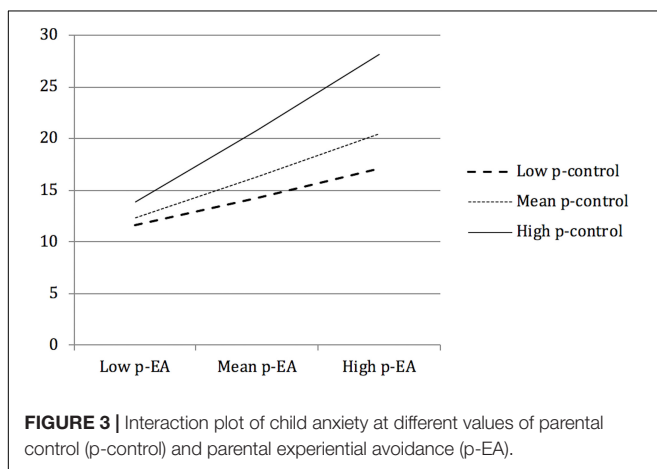
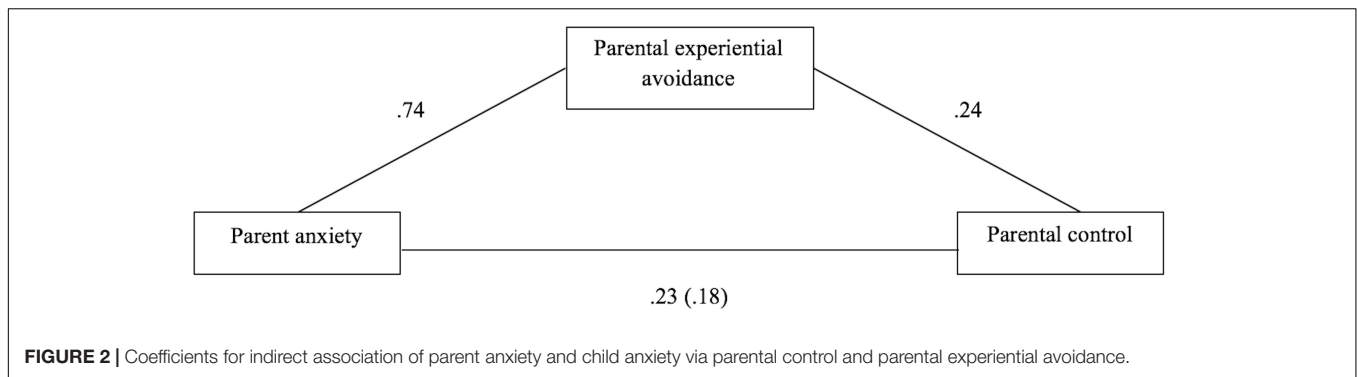
The current study investigated the intergenerational relationship between parent and child anxiety, and examined parenting factors that may be associated with and account for the variance in child anxiety. More specifically, we extended previous lines of inquiries around the role of parental control by the inclusion of an affective parenting component, namely experiential avoidance. Parental experiential avoidance has been posited as a potential explanation for parental controlling behavior in relation to child anxiety. The two objectives of our study were to investigate: (i) the indirect effect of parent anxiety on child anxiety through parental control and parental experiential avoidance and (ii) the indirect effect of parent anxiety on parental control through parental experiential avoidance.

The findings from regression analyses indicated that parental experiential avoidance was a significant predictor of child anxiety, after controlling for parent anxiety and parental control. Consistent with previous research (Francis and Chorpita, 2011), parent anxiety was a significant predictor of child anxiety, lending further support to research that has demonstrated that anxiety co-occurs in parents and children (Waters et al., 2012). In line with our predictions, parental control emerged as a significant predictor of child anxiety, accounting for 7% of the variance in child anxiety. The amount of variance explained by parental control is consistent with that which is

reported by McLeod et al. (2007) in their meta-analysis and with previously reported correlations (Murray et al., 2009). The association replicated here lends support to theories that emphasize parental control in the development and maintenance of child anxiety (Chorpita and Barlow, 1998), which suggest that when parents fail to give their child the opportunity to experience control in age appropriate contexts, the child may be vulnerable to developing anxiety (Barlow, 2002). We extended this understanding, by demonstrating that parental experiential avoidance is also a key predictor of child anxiety. Similarly, Cheron et al. (2009) also found that parental experiential avoidance predicted child anxiety.

The current study is also the first to demonstrate the indirect effects of parent anxiety on child anxiety through parental experiential avoidance. These findings indicate a key role for parental experiential avoidance in explaining the co-occurrence between parental and child anxiety, which has not previously been considered. An intolerance for their own and their child's distress is likely to be a triggering factor in how parents behave with their child. Parents' own cognitive and affective coping, such as experiential avoidance, may influence their parenting behavior with their child, as well as modeling to their child how a potentially ineffective means of coping with anxiety.

Tiwari et al. (2008) theorized that experiential avoidance may be a mechanism that leads parents to behave in controlling ways. Hence, in order to control, alter or avoid intolerable thoughts and feelings in relation to their child being in distress, parents may behave in controlling ways in order to diminish their own internal distress (Tiwari et al., 2008), for example engaging in high levels of intrusion or excessively monitoring their child's activities (Bögels and Brechman-Toussant, 2006). We demonstrated that parental anxiety predicted increased parental control, and that there was an indirect effect through parental experiential avoidance. Parents with higher anxiety are more likely to struggle to tolerate the experience of their child being in distress, and as such are more likely to engage in controlling behaviors to rid themselves of their own associated distress. In this manner, parental experiential avoidance may be the affective trigger to parents' behavioral responses toward their child in



those moments of high anxiety, or indeed to prevent such from occurring.

Moderation analyses indicated that the relationship between parental control and child anxiety was only significant under conditions of high parental experiential avoidance. When parents report high levels of experiential avoidance, higher levels of parental control are associated with higher levels of child anxiety. Therefore, as a result of parental control, the child may not learn valuable coping skills, which in turn may lead to them being vulnerable to developing anxiety (Chorpita and Barlow, 1998). Consistent with this hypothesis, Hudson et al. (2008) found that mothers of anxious children were more intrusive, a key aspect of parental control, when their child displayed negative emotions, compared to positive emotions. The interaction between parental control and experiential avoidance in the current study postulates a possible mechanism for this parental controlling and intrusive responding. The current study suggests that high levels of experiential avoidance may impair a parent's ability to respond sensitively to situations that induce anxiety in their child (Raftery-Helmer et al., 2016). When parents report low levels of experiential avoidance, then parental control is unrelated to child anxiety. The exact mechanism of this interaction requires further investigation. As these relationships are bidirectional, it may be that increased child anxiety provokes parental control only when parents are high in experiential avoidance.

The presence of direct effects in our mediation models indicates that other mechanisms that were not assessed are involved in the relationships between the variables studied, for example parents' own anxiety will influence their reporting of their child's anxiety. In addition, parents' expectations of their child will likely also impact on their reporting of their child's anxiety. For example, parent expectation of their child's ability to cope has been shown to be associated with the development of child anxiety (Emerson et al., 2018). Notwithstanding the contribution of other parenting factors, such as warmth, rejection, and attachment, we know that genetics account for a large proportion of variance in the association between parent and child anxiety (Eley and Gregory, 2004). In addition, demographic variables such as gender and age are likely to influence the associations observed in the current study.

Although we did not set out to examine the role of gender in our study, two findings of interest emerged from our data. First, parents of boys reported that their child experienced significantly higher levels of anxiety than parents of girls. The increased levels of anxiety reported for boys, compared to girls, contrasts with previous research, which has found that girls experience higher rates of anxiety than boys (e.g., Roza et al., 2003; Waters et al., 2012). Second, no differences were observed between reports from mothers ($n = 73$) and fathers ($n = 12$) in the current study, in relation to their own anxiety, or parenting factors (control and experiential avoidance). The unequal numbers of mothers and fathers in this study limits inferences that can be drawn from the observed findings, and precluded subsequent analyses. Previous research that has aimed to assess differences between mothers and fathers reported that women experienced greater anxiety, avoidant coping, and experiential avoidance than men (Panayiotou et al. (2017). Parental gender may interact with the observed relationships in the current study, given previous research demonstrating differential relationships between parental control and child anxiety by parent gender and child age (Verhoeven et al., 2012). The picture regarding the effects of development, gender and environment is complex and beyond the scope of this study. However, future research should seek to clarify the role of child and parent gender in the relationship between these parenting factors and child anxiety.

The current findings suggest that parental experiential avoidance should be considered alongside parental control

in future research on parent and child anxiety. Targeting parental distress tolerance may be an avenue for improving treatment effects for child anxiety; however, recent research provides some inconsistent preliminary findings in this regard. Emerson et al. (unpublished) demonstrated that improvements in parental experiential avoidance following a mindfulness-based parenting intervention uniquely predicted improvements in child internalizing problems. In contrast, a pilot randomized controlled trial of a tailored parent intervention targeting parental distress tolerance, Hiller et al. (2016) reported no differences in child anxiety outcomes compared to standard behavioral parenting intervention. Hiller et al. (2016) did report differential effects on positive parenting and the quality of the parent-child relationship, with increases for those in the targeted treatment condition, and decreases for those in the standard condition. The question remains whether targeting parental experiential avoidance within parenting interventions may or may not indicate improvements in child outcomes. The effects of such an intervention may be broader, in relation to decreased negative parenting and increased positive parenting, with relational implications in the parent-child dyad.

Limitations and Future Research

The proposed model of effects of parent anxiety on child anxiety via parental control and experiential avoidance is consistent with previous research and theory of the intergenerational relationship of anxiety. However, the current study has a number of limitations that should be noted. It is likely that the overall explanatory model of these parenting factors will be more complex than is possible to assess in the current study. For example, parents' own experience of anxiety will influence the interaction between the two parenting factors: control and experiential avoidance. In turn this will have differential associations with child anxiety. Future longitudinal research is therefore necessary to assess a potential moderated mediation model, with the indirect effect of parental control on child anxiety via parental experiential avoidance being moderated by parental anxiety. This research necessitates child self-report, or clinician assessment of child anxiety, in order to remove potential bias created by parents' own anxiety.

Research using longitudinal and experimental designs is also required to disentangle the direction of the relationships observed and thus clarify whether anxious children evoke parental experiential avoidance and controlling parenting or whether parental control and parental experiential avoidance develops as a response to the parent's own anxiety. Future research should also examine other unhelpful parenting behaviors that parents may employ when they engage in experiential avoidance, which may impact on child anxiety. For example, parental rejection has also been found to be an important parenting behavior in child anxiety (Bögels and Brechman-Toussant, 2006). Parents may be more likely to behave in rejecting ways when they are finding it difficult to tolerate their child's distress.

The current study measured the concept of experiential avoidance in terms of parents finding it difficult to tolerate seeing their child in distress (Cheron et al., 2009). However, it is possible that parents who experience anxiety may also engage in experiential avoidance when they experience difficult emotions in relation to their child behaving in a way that may be anxiety provoking for them, but not causing any distress to the child (Tiwari et al., 2008). Therefore, future research would benefit from examining this aspect of experiential avoidance that parents may engage in, in relation to parent and child anxiety.

The current study relied on parental report of parenting behavior and child anxiety. While this is a common approach reported in the literature (Bögels and Brechman-Toussant, 2006; Borelli et al., 2015), previous research has demonstrated that parents often under report negative parenting behavior, when compared to child reports of the same behavior (Bögels and van Melick, 2004). Furthermore, when parent and child reports of child anxiety are compared, there is often low agreement between informants (Bögels and Brechman-Toussant, 2006). The associations observed in the current study may be unique to parents' perceptions; their report of their child's anxiety will likely be enmeshed with their predictions of their child's ability to cope, which is inevitably influenced by their own experience of anxiety. Nonetheless, parent perceptions are valid and pivotal to understand given that they are usually the driving force behind support seeking and advocacy for their child. Future work should include multiple reporting with both parent and child reports and observational measures in order to disentangle the influence of parental cognitions and beliefs of their perception of their child, and aid further understanding of the observed relationships in the current study.

Further, in relation to measurement, the parenting constructs assessed in the current study are likely to have a degree of overlap. The correlation coefficients did not preclude regression analyses, but do indicate that further research is warranted to understand the unique elements in these parenting constructs and inform operationalization. The measure of parental control utilized in the current study combined behavioral, affective and cognitive aspects of parental control. The scale was formed of a collection of items taken from a broad-based measure of parenting, which combined to indicate parenting behavior that is controlling or restrictive of child autonomy (Borelli and Margolin, 2013, Unpublished). Some of the items in the scale seem to also overlap with other parenting constructs, such as parental rejection (e.g., 'I am less friendly when my child doesn't see things my way'). In the context of child anxiety, parental control has been referred to as vigilance, intrusion, and inhibition of the child's independence (Bögels and Brechman-Toussant, 2006). Thus, parental control can be considered as an over-involvement and restriction of the child's autonomy. In this sense, it is expected that parental control will overlap to varying degrees with other parenting constructs. Measurement methods other than self-report will be essential to extend our understanding of where and when parental experiential avoidance and parental control diverge and meet in the context of childhood anxiety. Future research should

therefore utilize observational tools of parenting or at a minimum incorporate measures with a clear operationalization of parental control.

The majority of participants in this study described themselves as white British and were mostly mothers from a community sample in one part of Northern England; therefore, the generalizability of the findings is limited. The findings also require replication with children at other developmental stages and with clinical populations (parent and child).

Practical Implications

The present findings have a number of practical implications. Given the observed relationships between parental anxiety, parenting factors and child anxiety, preventative approaches could consider targeting parents who experience high levels of anxiety. For example, it may be helpful to target parents who are seeking treatment for their own anxiety in adult mental health services and provide parenting interventions that teach parents about the impact their behavior may have on the development or maintenance of anxiety in their child. The content from established parenting programs (such as 'From Timid to Tiger' for anxious children and their parents; Cartwright-Hatton et al., 2010) could be used to inform programs for anxious parents accessing adult mental health services.

The highlighted role of parental control in child anxiety suggests that if parents are able to reduce the amount of control they employ in their parenting; this may reduce the risk of anxiety in their child. In the treatment of anxiety in childhood, Cognitive Behavioral Therapy (CBT) has been identified as an empirically supported intervention (see James et al., 2013 for a meta-analytic review). Borelli et al. (2015) suggest that in order to work on reducing parental control, parents could be supported to use imaginal exposure or behavioral experiments to slowly reduce the amount of control they exert over their children. However, given that the current study has also found that the concept of parental experiential avoidance is an important predictor in child anxiety, it may be that these methods would be difficult for parents who struggle to tolerate their anxious child's distress and consequently their own distress.

Parenting programs designed for parents of anxious children have focused on parental rearing behavior as reinforcers of child

anxiety, such as parent modeling of fear response (Cartwright-Hatton et al., 2010). Some family-based therapies for child anxiety have also included a parenting component as an adjunct to individual child CBT. Parents' own anxiety and their expectations of their child are targeted with CBT strategies (Ginsburg and Schlossberg, 2002). It may be a useful enhancement for such interventions to also target parental experiential avoidance first. Pertinent to this idea, when children receive CBT, a key component of the treatment is that they are exposed to situations that make them feel anxious (Barmish and Kendall, 2010). However, it is often the parents who may be involved in supporting their child to do this as being exposed to anxious situations often takes place between therapy sessions. Hence, parents are in effect, asked to support their child in experiencing distress during these intentionally anxiety provoking situations. Parents may receive training in delivering these aspects of therapy, at which point they could also be provided with support to manage their own emotional experience of this therapeutic task. If parents engage in experiential avoidance, it is likely that they may not tolerate supporting their child to do this and might either not do the home exercises with their child or behave in ways to rid themselves of their distress, which in turn may maintain their child's anxiety. Tiwari et al. (2008) suggested that parents should be recruited as collaborators in CBT for child anxiety, and their own experiential avoidance monitored through their child's exposure-based therapy. Mindful parenting interventions have been shown to target parental experiential avoidance (Emerson et al., unpublished), and may prove a useful adjunct to CBT for child anxiety. Therefore, addressing parental experiential avoidance should be an element in both the prevention and treatment of child anxiety.

AUTHOR CONTRIBUTIONS

L-ME contributed to the design of the study, analyzed data, and drafted the manuscript. CO contributed to the design of the study, collected data, conducted data analyses, and contributed to writing the manuscript. GR contributed to the design of the study and to the writing of the paper.

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Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Evaluating Mindful With Your Baby/Toddler: Observational Changes in Maternal Sensitivity, Acceptance, Mind-Mindedness, and Dyadic Synchrony

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Studies on the effectiveness of mindful parenting interventions predominantly focused on self-report measures of parenting, whereas observational assessments of change are lacking. The present study examined whether the Mindful with your baby/toddler training leads to observed changes in maternal behavior and mother-child interaction quality. Mindful with your baby/toddler is a 8- or 9-week mindful parenting training for clinically referred mothers of young children (aged 0–48 months), who experience parental stress, mother-child interaction problems, and/or whose children experience regulation problems. The study involved a quasi-experimental non-random design including a sample of 50 mothers who were diagnosed with a mood disorder ($n = 21$, 42%), an anxiety disorder ($n = 7$, 14%), post-traumatic stress disorder ($n = 6$, 12%), or other disorder ($n = 7$, 14%). Mothers completed a parental stress questionnaire and participated in home observations with their babies ($n = 36$) or toddlers ($n = 14$) during a waitlist, pretest, and posttest assessment. Maternal sensitivity, acceptance, and mind-mindedness were coded from free-play interactions and dyadic synchrony was coded from face-to-face interactions. Sensitivity and acceptance were coded with the Ainsworth's maternal sensitivity scales. Mind-mindedness was assessed by calculating frequency and proportions of appropriate and nonattuned mind-related comments. Dyadic synchrony was operationalized by co-occurrences of gazes and positive facial expressions and maternal and child responsiveness in vocal interaction within the dyad. Coders were blind to the measurement moment. From waitlist to pretest, no significant improvements were observed. At posttest, mothers reported less parenting stress, and were observed to show more accepting behavior and make less nonattuned comments than at pretest, and children showed higher levels of responsiveness. The outcomes suggest that the Mindful with your baby/toddler training affects not only maternal stress, but also maternal behavior, particularly (over)reactive parenting behaviors, which resulted in more acceptance, better attunement to child's mental world, and more "space" for

children to respond to their mothers during interactions. Mindful with your baby/toddler may be a suitable intervention for mothers of young children with (a combination of) maternal psychopathology, parental stress, and problems in the parent–child interaction and child regulation problems.

Keywords: mindful parenting, mother–child interaction, maternal sensitivity, mind-mindedness, emotional communication, early intervention

INTRODUCTION

In Western society and in today's media, the transition into motherhood (or having another baby) is represented as a joyful and exciting time as this is assumed to be a period of emotional growth that emerges naturally (Winson, 2009). For many mothers, this idealistic image is not a close representation of their experience of this transition, as having a baby can be stressful and challenging (Ben-Ari et al., 2009; Kwon et al., 2013). Stress in mothers involves the extent to which mothers perceive themselves as having access to the resources required to carry out the parenting role (Belsky, 1984). Mothers of newborn children often juggle between holding on to their old life and adapting to newly gained responsibilities, including the regulation of the child sleeping and eating pattern, continuous availability, and regular worries about their infants' health and development (Hung, 2007). These newly gained responsibilities affect career paths, sleeping patterns, romantic relations, and identities, that can get lost in the role of being a mother (Dew and Wilcox, 2011; Epifanio et al., 2015). Further, toddlerhood places distinctive tasks and challenges on parents with regard to the different developmental needs of children, such as the onset of independence, willfulness, and social competence (Edwards and Liu, 2002; Kwon et al., 2013). Thus, whereas being a mother is expected to bring joy, motherhood in the early years also brings distress upon a lot of mothers.

Elevated or recurrent levels of stress can lead to chronic stress, which increases the risk of mental health problems (Lupien et al., 2009). A remarkable high percentage of the new mothers develops depression (19.2%) or anxiety disorder (11.1%) in the first 3 months after child birth (Gaynes et al., 2005; Reck et al., 2008), and during toddlerhood elevated stress levels continue to predict depression and anxiety (Mathiesen et al., 1999). Stress and mental health problems are not only harmful to caregivers themselves, but also to children. The high rate of psychopathology and impaired functioning in the offspring of caregivers with, for instance, anxiety or depression, compared with caregivers without mental health problems is one of the best reproduced findings in psychiatry (e.g., Eley et al., 2015; Weissman et al., 2016). Anxious, depressed, or highly distressed parents have shown to lack frequent mentalizing and sensitive parenting behaviors during interactions (Nicol-Harper et al., 2007; Feldman et al., 2009; Pawlby et al., 2010; McMahan and Meins, 2012), which may evoke poor quality of parent–child interactions (Crnic et al., 2005). Low-quality interactions, in turn, impede the child's optimal development and increases the risk of socio-emotional problems, such as perceived temperamental difficulties and

insecure attachment representations (Crnic et al., 2005; Henrichs et al., 2009). Understanding how we may prevent or reduce parental stress seems therefore an important goal for mental health care sciences.

Mindfulness is awareness that arises through paying attention in the present moment to whatever appears and observing it non-judgmentally and without reactivity (Brown and Ryan, 2003; Kabat-Zinn, 2003; Creswell and Lindsay, 2014). Practice in mindfulness meditation have been shown to be effective in improving stress regulation (Khoury et al., 2015). The past two decades, the application of mindfulness in the context of parenting stress (i.e., mindful parenting) is growing (Bögels et al., 2010). Mindful parenting interventions are relationally oriented and aim to stimulate parents to focus mindful attention on parent–child interactions (Cohen and Semple, 2010). During mindful parenting training, parents learn to observe and listen to their child in a special way: deliberately, with full attention, and without judgment. Further, they learn to recognize and to make a distinction between their own emotions and those of the child, to lower parental reactivity in parent–child interactions, and to feel compassionate for themselves and their child (Duncan et al., 2015).

An adaptation of mindful parenting addressing mothers who experience stress in taking care of their young children is the Mindful with your baby/toddler training (Potharst et al., 2017, 2018). Mindful with your baby/toddler is a group training (Bögels and Restifo, 2013), involving meditation exercises based on mindfulness-based stress reduction training (MBSR; Kabat-Zinn, 1990), and mindfulness-based cognitive therapy (MBCT; Segal et al., 2002, 2012). The training is adapted to the context of parenting in early childhood and to the presence of the young children in the training. Other important elements of the training are inquiry, in which participants share their experiences during meditations, and psycho-education about themes related to both mindfulness and child development (i.e., the circle of security is introduced as a frame of reference for looking at attachment-related behavior of the children; Powell et al., 2013). In the Mindful with your baby/toddler training, parents not only learn to increase their awareness of inner experiences in the present moment, but also in the presence of, and in relation to their child. They learn to be attentive to their child and the child's signals, and practice mindfulness in stressful situations (Potharst et al., 2017, 2018). Having their child by their side during the training (in most of the sessions) helps mothers to apply what they learn during training to daily life experiences with their child.

Two previous studies on the effects of the Mindful with your baby/toddler training on mother and child outcomes showed positive effects on a wide variety of mother and

child outcomes (Potharst et al., 2017, 2018). In the first study including 37 mothers and their 0 to 18-months-old infants, mothers reported significantly higher scores on questionnaires on mindfulness, self-compassion, mindful parenting, as well as on well-being, psychopathology, parental confidence, responsiveness, and hostility at posttest, 8-week follow-up, and 1-year follow-up (Potharst et al., 2017). In the second study (Potharst et al., 2018), including 18 mother–toddler dyads (aged 18–48 months), mothers reported positive changes in child psychopathology, mindfulness (awareness and non-reactivity), and self-compassion and these changes sustained or further improved during the follow-up period. Further, mothers reported lower levels of child dysregulation, maternal internalizing psychopathology, maternal stress, sense of incompetence, and higher levels of non-judging of inner experience, but only at the 2- and 8-months follow-up. Mothers also showed more sensitive and accepting behaviors during observations at posttest in this study.

These two studies provided first indications that the Mindful with your baby/toddler training may be beneficial, not only for the mother, but also for the mother–child relationship. However, the results on the mother–child relationship were either based on a small sample size ($n = 18$) of mother–toddler dyads, or based on maternal self-report, while this is not sufficient to measure parent–child interaction (Miron et al., 2009). When investigating change in complex transactional relationships such as the mother–child relationship, survey data may be biased by social-desirability of participants, or bias in interpretations of questions, and limitations with regard to the operationalization of complex relational constructs (Hops et al., 1995; Dishion and Granic, 2004; Morsbach and Prinz, 2006). Since mindful parenting interventions are designed to bring about changes in the parent–child relationship, observational measures of both parenting behavior and the parent–child relationship quality should be included in effectiveness studies (Duncan et al., 2015).

In the present study we, therefore, investigated the effects of the Mindful with your baby/toddler training observing different features of parenting behaviors and the interaction quality between mothers and their child. More specifically, we have focused on the following dimensions that have been shown to be particularly important for children's early development and that are likely to change from mindful parenting training: parental sensitivity, acceptance, mind-mindedness, and dyadic synchrony. Below, we first briefly explain these parenting behaviors and characteristics, as well as their importance in predicting adaptive child development. We then explain why and how mindful parenting training in general, and the Mindful with your baby/toddler training in particular, might lead to changes in these behaviors and characteristics.

Parental sensitivity refers to the parent's ability to interpret the child's (behavioral, physical, and emotional) signals and respond to them in an appropriate and prompt manner. This concept has grown out of observational research attempting to understand variations in children's secure attachment to their parents (Ainsworth, 1969; Ainsworth et al., 1974, 1978). Sensitivity is assessed from home-based observations of parent–child interaction, by rating the entirety of parenting behaviors shown

during the interactions on a scale from 1 to 9 (Ainsworth et al., 1974). From the same home observations, Ainsworth (1969) developed a scale of *acceptance versus rejection*. A parent is accepting when there is sufficient balance between positive and negative feelings of the parent toward the child. The accepting parent respects the child's desire for autonomy, mastery, and negative emotion (anger and frustration). Acceptance furthermore encapsulates the parent's ability to empathize with the child, without losing touch with his or her own positive and negative emotions (Ainsworth, 1969). The importance of sensitive and accepting caregiving with regard to children's adaptive and healthy development has become clear from a large body of research over the past decades. Parental sensitivity and acceptance have shown to predict a wide variety of positive child outcomes, most important children's secure attachment, affect/stress regulation, and social-emotional competence understanding (e.g., Volling et al., 2002; Hughes et al., 2005; Khaleque and Rohner, 2012; Putnick et al., 2015; Taylor-Colls and Pasco Fearon, 2015; Zeegers et al., 2017).

Mind-mindedness is defined as parents' tendency to treat their child as a mental agent, an individual with autonomous thoughts, feelings, and desires (Meins, 1997, 2013). This concept also grew out of observational research attempting to understand variations in (in)secure child–parent attachments (Meins, 1997; Meins et al., 2001). In early childhood, mind-mindedness is assessed as parents' tendency to comment appropriately or in a nonattuned manner on their infant's presumed internal states during a free-play situation (Meins et al., 2001; Meins and Fernyhough, 2015). The appropriate and nonattuned indices reflect two orthogonal dimensions of mind-mindedness, unrelated to each other in mothers (Meins et al., 2003, 2012). Appropriate mind-related comments reflect attunement to and validation of the infant's internal state. Nonattuned comments reflect the extent to which misinterpretations of the infant's state emerge, and/or when parents project their own state of mind or impose their own agenda on the infant (Meins, 2013). Greater mind-mindedness is indicated by high levels of appropriate mind-related comments or low levels of nonattuned mind-related comments. Mind-mindedness has shown to be lower in mothers with mental disorders, mothers who experience parenting stress, and in adolescent mothers (Pawlby et al., 2010; McMahon and Meins, 2012; Crugnola et al., 2014). Moreover, next to sensitivity, mind-mindedness has also shown to be an important and independent predictor of secure attachment, emotion regulation, social-emotional functioning in early childhood (Meins et al., 2002; Laranjo et al., 2008; Bernier et al., 2010; Zeegers et al., 2017, 2018).

Dyadic synchrony involves the co-occurrence and coordination of attention (gaze), emotional expressions, and vocalizations during the parent–child interaction (Yale et al., 2003; Colonesi et al., 2012; Beebe et al., 2016). The general concept of dyadic synchrony refers to an array of interactive behaviors between parent and child such as responsiveness, reciprocity, mutuality, and shared emotion, typically assessed during face-to-face interactions. In the present study we focus on two forms of parents' and children's temporal coordination of behaviors. First, the temporal contingency of facial expressions

and gaze (Yale et al., 2003; Colonnese et al., 2012). Second, the turn-taking in vocal interaction (Feldstein et al., 1993; Gratier et al., 2015; Beebe et al., 2016), assessing how often the vocalizations of the mother were followed directly by vocalizations of the child and vice versa. Both the synchronous timing and the vocal turn-taking are considered to be important determinants of the quality of early parent–child interaction. That is, both provide children with opportunities to experience the mutual regulation of positive arousal, and to construct the structure of contingency and coordination characteristic of adult communication (Feldman et al., 1999; Leclère et al., 2014). Symptoms of depression, anxiety, and distress in mothers were shown to be related to disturbances in dyadic synchrony (Feldman, 2007), which is directly linked to infants' current and later social, emotional, and psychological functioning (Feldman et al., 1999; Moore and Calkins, 2004; Feldman, 2007; Lindsey et al., 2009; Leclère et al., 2014).

Considering the core elements of mindful parenting interventions, and more specifically the core elements of the Mindful with your baby/toddler training, there are several reasons why it is important to study the effects of training on mothers' sensitivity, acceptance, mind-mindedness, and dyadic synchrony. First of all, the Mindful with your baby/toddler training involves practice in listening to the child with full attention through mindfulness meditation (Potharst et al., 2017). These practices are thought to improve parents' attention and receptive awareness to the experiences of the present moment (Brown and Ryan, 2003; Baer and Krietemeyer, 2006). The mindfulness meditations in Mindful with your baby/toddler also aim to improve parents' self-control and to reduce their immediate reactions to their own thoughts, or feelings and external child-related events. Additionally, parents get the opportunity to practice being attentive to their own and to the child's inner states by means of individual, and mother–child watching meditations, as well as the inquiry afterward (Siegel and Hartzell, 2003). These mindful parenting abilities all underlie parents' tendency to form correct interpretations of children's behavioral and verbal signals. That is, they reduce the use and influence of automatic cognitive processes, preventing bias in the interpretations of signals (Duncan et al., 2009). In turn, an appropriate interpretation of the child's signals is at the heart of the concepts of maternal sensitivity and mind-mindedness (Ainsworth et al., 1974; Meins et al., 2001; Meins, 2013). Therefore, mothers are expected to show less insensitive behaviors and greater levels of mind-mindedness after the training.

Another important focus of the Mindful with your baby/toddler training is teaching parents to take a non-judgmental and compassionate stance toward their child's and their own traits, attributes, and behaviors, which leads to the lower rejecting and dismissing parenting behaviors, as well as respect for the child's autonomy (Ainsworth, 1969; Duncan et al., 2009; Bögels and Restifo, 2013). We, therefore, expect that after the training mothers will be more accepting as rated by independent observers. Furthermore, higher levels of compassion for the self and child should also come forward in positive changes in parental acceptance, as more self-compassion

would lead to more positive, and less negative, affection in the parent–child relationship (Ainsworth, 1969).

Lastly, the above described mindful parenting behaviors and abilities can also lead to more implicit and embodied forms of attuned caregiving. As mindful parents are sensitive both to the content of conversations as well as their child's tone of voice, facial expressions, and body language (Duncan et al., 2009), this might also be reflected in more synchronous timing of facial expressions and gazing (Siegel and Hartzell, 2003). We, furthermore, expected that mothers would show less turn-taking behaviors, as they were stimulated to be attentive to the present moment, in a non-judgmental and non-reactive manner. Additionally, we expected that children would show higher levels of turn-taking (responsiveness) as a result of increases in mothers' mindful attitude and lower (over)active parenting during mother–child interactions.

The present study evaluated the effects of the Mindful with your baby/toddler training for mothers of young children (aged 0–48 months), who experience parental stress, mother–child interaction problems, and/or whose children experience regulation problems. A quasi-experimental design was used, with a waitlist assessment, pretest, and posttest. On the basis of the above-mentioned literature, we hypothesized that the Mindful with your baby/toddler training would be effective in reducing parenting stress, but also in improving observed maternal sensitivity, acceptance, mind-mindedness, and mother–child synchrony.

MATERIALS AND METHODS

Study Design and Procedure

The present study had a quasi-experimental design, consisting of three measurement waves (waitlist, pretest, and posttest). During these waves home visits were conducted to record mother–child free-play sessions and face-to-face interactions. Furthermore, mothers filled out online questionnaires on their levels of parenting stress. The waitlist assessment was administered at least 5 weeks before starting the Mindful with your baby/toddler training. The mean waiting time for those who had to wait was 7.60 weeks ($SD = 1.30$). The home observations were repeated the week before the start of the training (pretest), and the week directly after the training (posttest). The home observations were coded by trained coders who were blinded to the measurement occasions (waitlist, pretest, and posttest).

Data of the present study were collected from 15 group trainings, which consisted of three to six mother–child dyads and started between October 2015 and February 2018. The intervention took place at a community child mental health center or a mindfulness center. Fifty mothers with their infants ($n = 36$) or toddlers ($n = 14$) were admitted to Mindful with your baby/toddler because of parental stress and/or mother–child interaction problems and/or child regulation problems. They were referred by general practitioners, midwives, or mental health care providers or they could enroll themselves.

Mothers were asked to participate in this research before the start of the training and gave informed consent. The study

was approved by the ethical committee of the Faculty of Social and Behavioral Sciences at the University of Amsterdam. The mother–toddler dyads that took part in the current study were also part of an earlier study on the self-reported effects of the Mindful with your toddler training (Potharst et al., 2018). Part of the data on sensitivity, acceptance, and parenting stress was also presented in this article.

Instruments

Parenting Stress

Parenting stress was assessed with the Dutch Parenting Stress Index-Short Form (PSI-SF, Brock et al., 1992), based on the American Parenting Stress Index (Abidin, 1983). The Dutch PSI-SF originally consists of 25 items, for example, “Considering only this child, parenthood is more difficult than I thought it would be.” Items are rated on a 6-point Likert scale, ranging from 1 (totally disagree) to 6 (totally agree). We removed two items, since they were not suitable for measuring parenting stress within the infant–caregiver relationship (i.e., “My child’s attention fades more often than I thought” and “When I prohibit something, later, my child will do this again”). In the analyses, we used mothers’ average item score as outcome measure (i.e., sumscore divided by 23). The Dutch PSI possesses good reliability, with reliability estimates ranging between $\alpha = 0.92$ and $\alpha = 0.95$ (Brock et al., 1992; Egberink et al., 2014). In the present study, internal consistency for the total score at pretest was $\alpha = 0.92$.

Sensitivity and Acceptance

Sensitivity and acceptance were assessed from the 10-min free play sessions recorded at home. Mothers were instructed to play with their child with (5 min), and without (5 min) age-appropriate toys. Both scales were assessed using the scale of Ainsworth (1969). The first scale, *sensitivity versus insensitivity*, captures whether a mother is sensitive or insensitive to the signals of her child. Sensitive mothers made themselves available to perceive child signals, attributed meaning to these signals by acting promptly and appropriately upon them. For instance, a low score was given when a mother initiated a new toy when the child was still actively engaged with another toy. The second scale, *acceptance versus rejection*, captured whether a mother showed acceptance of the child’s initiatives and positive and negative feelings, while showing patience, positive affectivity, and warmth toward the child. For instance, a low score was given when mothers told their children to be quiet when they started crying. Video-observations were coded by four trained coders who evaluated every free-play session by assigning a score from 1 (highly insensitive/rejecting) to 9 (highly sensitive/accepting). Twenty percent of the observations were coded to assess inter-rater agreement. The intra-class correlation (ICC) among the coders was excellent (ICC = 0.83) for the *sensitivity versus insensitivity* scale and good (ICC = 0.76) for the *acceptance versus rejection* scale (Cicchetti, 1994). To prevent bias from single raters, every video-fragment was coded twice, by two different observers. Differences in scores were resolved by discussion.

Mind-Mindedness

Mothers’ mind-mindedness was assessed from the same 10-min free-play session as used to assess maternal sensitivity. Each

spoken word or sentence of the mother was transcribed and coded by two independent observers using a translated version of the mind-mindedness coding manual (Meins and Fernyhough, 2015). The mind-related comments were categorized according to the specific state the parent referred to. Categories were *cognitions* (e.g., “you recognize this toy from home”), *likes and dislikes* (e.g., “you don’t like this ball”), *emotions* (e.g., “you’re excited to play with these toys”), and *epistemic states* (i.e., “are you teasing me?”). Comments that were obviously meant to be dialogue said/thought by the infant (e.g., “Mommy, can you help me?”) were also classified as mind-related.

Second, mind-related comments were classified as being appropriate or nonattuned. Appropriate comments are those for which: (a) the trained coder agreed with the parent’s reading of the infant’s internal state, (b) the internal state comment linked the infant’s current activity with similar events in the past or future, or (c) the parent voiced (using the first person) what the child might say if he or she could speak. Comments were classified as nonattuned when the coder believed (a) the parent misread the internal state of the child, or (b) the comment referred to a past or future event that had no obvious relation to the infant’s current activity (e.g., “I’m sure you would like to feed the ducks later”). We calculated mind-mindedness in terms of the frequencies of mothers’ appropriate and nonattuned mind-related comments. Additionally, in order to control for maternal verbosity, we calculated proportions of mind-related comments by dividing the total amount of appropriate or nonattuned comments by the total amount of comments a mother made during the free-play session (Meins and Fernyhough, 2015).

Twenty percent of the observations was randomly selected to calculate the inter-rater agreement. The inter-rater agreement was $\kappa = 0.97$ for mind-related comments and $\kappa = 0.87$ for appropriateness of mind-related comments, which can both be classified as “almost perfect agreement” (Landis and Koch, 1977). Disagreements were resolved by discussion.

Dyadic Synchrony

In order to observe dyadic synchrony, 4-min face-to-face interactions were recorded (Tronick et al., 1978). The child was placed in a seat in front of the mother (keeping a 30–50-cm distance), and the mother was instructed to talk to and play with her child, as she would normally do at home, without objects. A dual lens camera recorded both the mother’s and the infant’s face and upper body. Three trained observers coded infants’ gaze direction facial expression and vocalizations independently of one another on a 1 s time base (state event; event with a start time and an end time) using *The Observer XT 13.0* (Zimmerman et al., 2009). The inter-rater agreement in this observation could also be classified as “almost perfect” (Landis and Koch, 1977): $\kappa = 0.88$ for gazing, $\kappa = 0.89$ for facial expressions, and $\kappa = 0.87$ for vocalizations. Dyadic synchrony was studied by examining the temporal coordination and the interactive contingency of the following three behaviors (Harrist and Waugh, 2002):

Gaze

The coding for children’s gaze included: (a) gaze at the parent when children were looking at their parent’s face or hands, and (b) gaze elsewhere referred to children looking away or

non-observable looking. Similarly, the coding for mother's gazing included: (a) gaze at the child when mothers were looking at their children's face or hands, and (b) gaze otherwise referred to mothers looking away or non-observable looking. Gaze otherwise was not included in the further analysis, but it represents the remaining time of the observation (240 s).

Positive facial expressions

We coded the emotional valence of mothers' and children's facial expressions (positive, neutral, and negative). Earlier studies showed that in typical interactions mothers' facial expressions are predominantly positive, and rarely and negative in face-to-face interactions (Aktar et al., 2017). If present, negative facial expressions often occur reflect the child's negative affect. We, therefore, only examined the co-occurrence of positive facial expressions in the current study. In line with this earlier evidence, less than 1% of maternal facial expressions during pretest were negative in the current study. We coded positive facial expressions in terms of closed and open smiles identified by raising corners of the lips, constriction of the eyes, raising of the cheeks, and opening of the mouth (Ekman and Friesen, 1978; Messinger et al., 2001).

Vocalizations

Vocalizations included verbalizations (words or sentences) and vocalizations: positive vocalizations such as chuckling, giggling, or laughing; neutral vocalizations such as babble; and negative vocalizations such as crying or fussing. For the analyses, positive and negative vocalizations were added up to a total vocalization score. Vegetative and reflexive vocalizations (hiccups, coughs, burps, etc.) were not coded.

The singular behavior of mother and child and their time-based co-occurrences were computed using the software for the collection and analysis of observational data, The Observer. With regard to dyadic synchrony, the following co-occurrences of pairs of behaviors were coded: (a) *coordination of gaze*: temporal co-occurrence of child gazing toward mother and mother gazing toward the child (in seconds; Lotzin et al., 2015); (b) *coordination of positive facial expression*: temporal co-occurrence of mother and child both displaying positive facial expressions (in seconds; Riehle et al., 2017); (c) *coordination of positive facial expression during gaze*: temporal co-occurrence of children's positive facial expression when gazing toward mother and mother's positive facial expression when gazing toward the child (in seconds; Weinberg and Tronick, 1994). With regard to the turn-taking vocal interaction between mother and child, the following turn-taking sequences were coded: (a) *maternal responsiveness*, mother responds to child's vocalization when the mother's vocalization happens within 2 s after the child's vocalization (frequencies; Lammertink et al., 2016); (b) *child responsiveness*, child responds to mother's vocalization when the child's vocalization happens within 2 s after the mother's vocalization.

For the variables coordination of gaze, positive facial expressions, and positive facial expressions percentages were calculated dividing the duration of the behavior (in seconds) by the total duration of the observation * 100. Percentages of *maternal responsiveness* were calculated by dividing the

number of maternal vocalizations after child vocalizations by the total number of child vocalizations. Percentages of *child responsiveness* were calculated by dividing the number of child vocalizations after maternal vocalizations by the total number of maternal vocalizations.

Intervention

The Mindful with your baby training and the Mindful with your toddler training are similar to each other in terms of aims, as well as in the mindfulness exercises. The training consists of eight (babies) or nine (toddlers) weekly sessions of 2 h, and an additional follow-up session 2 months later. The sessions are carried out in small groups with a maximum of six dyads per group. Each group is led by an experienced Mindful with your baby/toddler trainer (EP or IV). Other than the number of sessions, the infant and toddler training programs differ with regard to the presence of the children. In the Mindful with your baby training, the babies are present in all sessions, except for the first and the fifth session. The first session allows for a clear introduction in, and deeper understanding of mindfulness and the fifth session allows for a possibility to focus on learning self-compassion with full attention. In the Mindful with your toddler training, the toddlers join the training after Session 4, so from Session 5 to 9. The sessions without the toddlers are needed to lay a foundation in mindfulness abilities, before mothers are asked to apply these abilities with their toddler, which appeared to be more challenging in toddlers than in babies. Toddlers can make an appeal to their mothers quite strongly and directly, and this may make it harder for mothers to keep an observational stance while interacting with them. Also, toddlers explore more actively than babies, which brings about themes like conflicts between children, limit setting, shame about a child's behavior, etc. The sessions with the children allow for mothers to directly apply their learned mindfulness skills when they are in their parental role, making what is learned in the training more generalizable to the parent's everyday life.

The content of the training programs is described more elaborate in Potharst et al. (2017, 2018). Structural components of the training are formal mindfulness meditations based on MBSR (Kabat-Zinn, 1990) and MBCT (Segal et al., 2012). Another import component of the trainings involves meditations in which mothers focus on their child. This is done by watching meditations, in which mothers are asked to watch every step and behavior of the child with curiosity, and to empathize with the intentions and the discoveries of the child.

In the present study, trainers were accompanied by an Infant Mental Health Specialist (IMH-specialist) or psychologist in training. The IMH-specialist is responsible for the well-being of the mother-child dyads: she can observe the mother-child interaction, offer (emotional) support, and be available for discussion and evaluation with the trainer after the training sessions. However, for both IMH-specialists and the psychologists in training, the main task involved watching, and being available for the children during the meditation sessions in which the mothers close their eyes, and making sure the children were both emotionally and physically safe (e.g., by giving explanation of what happens to the children or by warning

the mindful parenting trainer or a parent when the meditation lasts too long for a particular child). We examined whether the difference in professional training of the second trainer affected the outcomes (see the section “Results”).

Data Analyses

The repeated measurements before and after the training led to a hierarchical dataset. We, therefore, used multilevel regression models consisting of repeated measurements of time (level 1), nested in mother–child dyads (level 2) to analyze the data. Next to accounting for nested data, an advantage of multilevel regression analyses is that missing data can be handled, and imputation is not needed (Kreft and De Leeuw, 1998). Analyses were ran with 50 families that completed at least the waitlist/pretest and posttest measures. Further, analyses were run with and without standardized scores on the continuous outcome measures. This way we could report on the unstandardized regression estimates (B) as well as the standardized estimates (β , which could be interpreted as effect size). The random effects of intercept and time on the outcome measure were tested in each model ($p < 0.050$). Additionally, to study if the treatment outcomes from the main multilevel analyses differed across the infant or toddler training, we reran the reported models after including the type of group (baby or toddler), and (in a separate model) the presence of second trainer (IMH specialist or psychologist in training), as well the interaction effect between time and group/trainer as covariates. Second, we tested whether adding random slopes to the models improved the fit of the model to the observed data, which would indicate that mothers show variation in their change from pre- to posttest.

To correct for the multiple comparisons, a false discovery rate (FDR) of 0.05 was applied (Benjamini and Hochberg, 1995). The FDR determines the expected proportion of false discoveries among significant findings, yielding a q -value based on the p -values of the multiple comparisons. P -values below the set q -value are considered statistically significant.

RESULTS

Participants

Fifty mothers ($M_{\text{age}} = 35.06$ years; $SD = 4.19$) with their infants ($n = 36$; $M_{\text{age}} = 9.57$ months; $SD = 5.38$; 20 boys) or toddlers ($n = 14$; $M_{\text{age}} = 2.50$ years; $SD = 0.57$; 10 boys) participated in the Mindful with your baby/toddler training. Thirty-three children (66%) were firstborn. The mothers' ethnicities were Dutch ($n = 36$; 72%), European-other ($n = 3$; 6%), and non-European ($n = 11$; 22%), and 22 (44%) mothers obtained a University degree, 23 (46%) a college degree, 2 (4%) secondary vocational education degree, and 2 (4%) a high school diploma. During the training, 24 mothers (48%) were working, 13 (26%) were on sick leave or without a job, 10 (20%) were stay-at-home mothers, 1 (2%) was a student, and 1 (2%) was on parental leave.

Based on clinical assessment during the intake sessions, mothers were diagnosed with a depression (21 mothers, 42%), anxiety disorder (17 mothers, 34%), post-traumatic stress disorder (PTSD) (6 mothers, 12%), or another disorder, such as an obsessive compulsive disorder or attention deficit hyperactivity disorder (7 mothers, 14%). Some mothers had more than one diagnosis. Fifteen mothers (30%) had no diagnosis. In the waitlist period, prior to the Mindful with your baby/toddler training, 62% (31 mothers) received psychological treatment or parenting support (often IMH treatment).

Response Rates

Figure 1 displays a flow chart of the participants at each measurement time. Three mothers did not want to participate in the home observations. For these mothers only demographic data and questionnaire data were available. With regard to the observational data, missing data on the mind-mindedness and sensitivity variables were due to technical problems or to mothers speaking a foreign language during the play. Missing variables on face-to-face interactions were more frequent due to technical difficulties or unclear recordings. In order to code synchrony in facial expressions and gaze, mother and child need to be recorded simultaneously by both lenses. Due to movement of the child and/or mother, some videos could not be coded due to poor recording. The dyads that did not have face-to-face recordings did not differ significantly from the dyads that did have recordings on any of the other observational measures at waitlist, pretest, and posttest. With regard to the data on sensitivity and mind-mindedness, 68% of the mothers were observed during the waitlist assessment, 92% during posttest, and 92% during follow-up. For dyadic synchrony, 50% of the mother–child dyads were observed during the waitlist assessment, 68% during pretest, and 68% during posttest. Exact numbers on the available data are presented in Table 1.

Preliminary Analyses

The means and standard deviations of the outcome variables are presented in Table 1. The residuals of the analyses were normally distributed (Tabachnick and Fidell, 2013). We checked whether any of the outcome measures correlated with demographic variables of the mothers [age, educational level, nationality (Dutch/non-Dutch)] at pretest. Mothers with a higher educational level were rated as more sensitive and accepting than mothers with a lower educational level at pretest, $r = 0.57$ and $r = 0.50$. We therefore added educational level as a covariate to the analyses. We examined whether the analyses with and without educational level as a covariate yielded different results, which was not the case. Therefore, we report the results of the main analyses without educational level as a covariate.

Effects of the Training

Table 2 presents the results of multilevel models with random intercepts of treatment outcome predicted by measurement occasion without any covariates. As we applied an FDR of 0.05, we reported the significance of effects in Table 2 when the p -values were below the set q -values. There were no

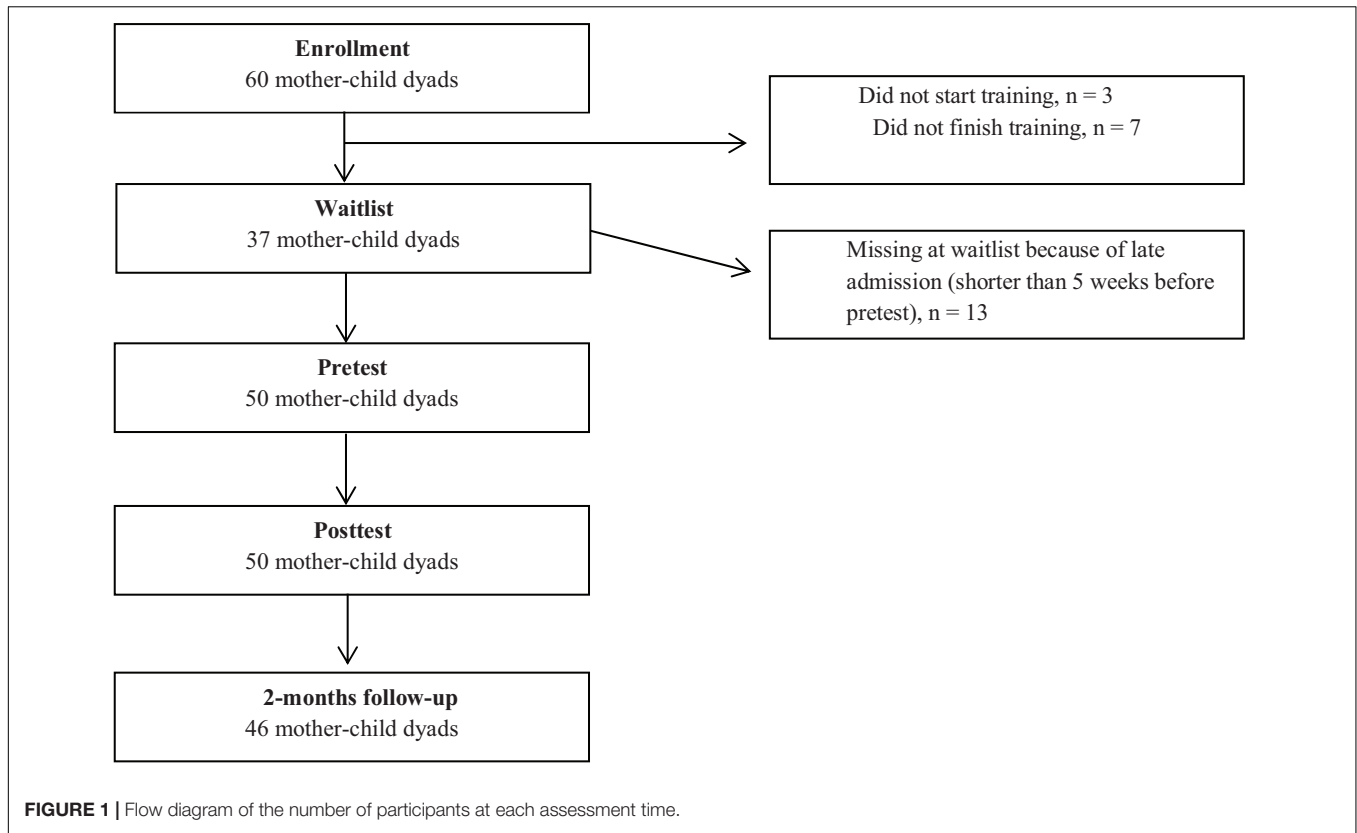


TABLE 1 | Means and standard deviations of all observational outcome measures at three measurement occasions.

	Waitlist		Pretest		Posttest	
	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>
Mother report						
Parenting stress	29	2.76 (0.83)	49	2.86 (1.00)	49	2.43 (0.83)
Observations						
Sensitivity	34	6.02 (1.75)	46	5.82 (1.88)	46	6.28 (1.85)
Acceptance	34	6.35 (1.91)	46	5.89 (1.93)	46	6.78 (1.59)
Appropriate mind-related comments (frequencies)	34	6.44 (5.72)	46	6.30 (4.49)	46	5.93 (3.73)
Nonattuned mind-related comments (frequencies)	34	2.71 (3.16)	46	2.41 (2.36)	46	0.91 (1.33)
Appropriate mind-related comments (%)	34	4.88 (3.66)	46	4.92 (2.75)	46	4.70 (2.78)
Nonattuned mind-related comments (%)	34	2.28 (2.49)	46	2.06 (1.98)	46	0.70 (0.10)
Coordination of positive facial expressions (%)	25	12.20 (12.15)	34	17.26 (15.38)	34	16.27 (17.03)
Coordination of gaze (%)	25	36.87 (22.87)	34	42.19 (23.32)	34	39.35 (24.69)
Coordination of positive facial expressions and gaze (%)	25	6.60 (8.60)	34	10.98 (9.80)	34	9.17 (12.11)
Child responsiveness (%)	25	15.48 (8.64)	34	16.00 (10.88)	34	20.14 (11.62)
Maternal responsiveness (%)	25	45.12 (20.23)	34	53.58 (24.70)	34	45.92 (18.34)

Data are presented as mean (standard deviation), *n* = number of available cases.

significant changes on the outcome measures from waitlist to pretest. Mothers reported less parenting stress from pre- to posttest (small to moderate effect size). Compared to pretest, at posttest mothers were more accepting toward their child (small to medium effect size) and produced less nonattuned mind-related comments (large effect size). Children showed more responsiveness in turn-taking at posttest compared to pretest, as

they were more likely to vocalize after the mother had vocalized (small to medium effect size). There were no pretest to posttest changes in the synchrony of facial expressions, gazing, and facial expressions during gazing.

We added random slopes to each model to test whether mothers showed variation in their response to the intervention (i.e., some mothers might show more change than others).

TABLE 2 | Unstandardized and standardized parameter estimates and *F*-values of multilevel models of observational outcomes predicted by measurement occasion (deviations from pretest).

	Waitlist			Posttest		
	<i>B</i> (SE)	β	<i>F</i>	<i>B</i> (SE)	β	<i>F</i>
Mother report						
Parenting stress	0.05 (0.13)	0.06	0.14	-0.24 (0.10)	-0.27	5.72*
Observations						
Sensitivity	-0.08 (0.28)	-0.04	0.74	0.43 (0.25)	0.24	2.93†
Acceptance	-0.36 (0.30)	-0.19	1.43	0.85 (0.27)	0.46	10.16**
Appropriate mind-related comments (frequencies)	0.21 (0.77)	0.05	0.08	-0.12 (0.69)	-0.03	0.04
Nonattuned mind-related comments (frequencies)	-0.26 (0.45)	-0.10	0.33	-1.50 (0.41)	-0.62	13.49***
Appropriate mind-related comments (%)	0.17 (0.55)	0.06	0.10	-0.06 (0.49)	-0.02	0.02
Nonattuned mind-related comments (%)	-0.23 (0.35)	0.12	0.45	-1.39 (0.31)	-0.70	19.63***
Coordination of positive facial expressions	4.81 (3.31)	0.32	2.12	-0.92 (2.97)	-0.06	0.10
Coordination of gaze	2.42 (5.46)	0.10	0.20	-1.57 (4.93)	-0.06	0.10
Coordination of positive expressions during gaze	3.09 (2.13)	0.30	2.11	-1.07 (1.91)	-0.10	0.32
Child responsiveness	0.87 (2.19)	0.09	0.16	4.24 (1.96)	0.40	4.67*
Maternal responsiveness	7.20 (4.79)	0.33	2.26	-7.61 (4.32)	-0.35	3.10†

B, the unstandardized parameter coefficient of the waitlist, post-test, and follow-up relative to the pre-test; *SE*, standard error of parameter estimate; β , the standardized beta coefficient, † $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. The parameter coefficients should be interpreted as relative to the pretest measurement.

None of the random slope models showed an improved fit to the observed data.

Covariates

We analyzed whether the treatment outcomes were dependent on the type of training group (baby or toddler) and/or whether the treatment outcomes were dependent on the presence of an IMH-specialist. There were no other significant interaction effects for type of group, suggesting that the outcomes described above apply to the mothers in the baby and toddler group. With regard to the presence of the IMH-specialist versus psychologist in training, we also did not find significant interactions effects.

DISCUSSION

Mindful with your baby/toddler is a group-based training for mothers of babies and toddlers who experience parental stress and/or problems in the parent-child relationship. The training is focused on reducing parental stress and improving the mother-child relationship through practicing mindfulness meditation with and without the child present. The main aim of this study was to evaluate whether the training not only reduces maternal self-reported parenting stress, but also changes objectively measured maternal behavior during parent-child interactions and mother-child interaction quality, as compared to waitlist. We therefore observed changes in maternal sensitivity, acceptance, mind-mindedness, and dyadic synchrony, next to collecting mothers' parenting stress reports. The results showed that mothers reported less parenting stress after the training (small effect size), were more accepting (medium effect size), and made less nonattuned references to the child's mental states (large effect size). The children showed higher levels of responsiveness after the training (small to medium effect

size). No improvements occurred on any of the outcome measures after waitlist, suggesting that the training underlies the observed outcomes.

First as expected, maternal stress decreased after the training, indicating that the training is effective in reducing mothers' stress in parenting their young children. The effect size however was small. In two earlier studies, parenting stress did not yet reduce at posttest but only 8 weeks after the Mindful with your baby/toddler training (Potharst et al., 2017, 2018), suggesting that parenting stress reductions may continue after the training has finished.

In line with our hypotheses, mothers behaved more accepting toward their children (small to medium effect size), which means that they showed less rejecting behavior in reaction to the child's initiatives and positive and negative feelings, and a more positive, warm, patient, and non-reactive attitude. Maternal sensitivity did not improve significantly indicating that this mindful parenting training seems to tap into the core aspects of acceptance more than the core aspects of sensitivity. Indeed, when mothers practice mindfulness they increase their capacity of "being present" with whatever comes up, whether it is pleasant or unpleasant (Kabat-Zinn, 2003). Examples of something unpleasant during a formal meditation could be pain or worries, and mothers practice not only with becoming aware of these experiences, but also to meet them non-judgmentally and with equanimity. Further, in the mindful parenting exercises, mothers learn to generalize what is learned in interaction with their children. So, they learn to meet difficulties with their child, like crying, and their own inner reactions to such difficulties, with patience and kindness. In the training, mothers receive psycho-education about the fight, flight, and freeze stress reactions. They practice with becoming aware of their own stress-related action tendencies, applying mindfulness when they notice a stress reaction, and then making a conscious choice in how they

want to respond to their child. Rejecting behavior is an example of a fight reaction that is directly addressed in the training, which aligns with the post-intervention changes in accepting behavior.

Mothers' ability to postpone judgment and reaction may underlie the decrease in nonattuned mind-related comments. Especially when children show behavior that is challenging or confusing to mothers, they may tend to express their distress in the form of judgments about the child (e.g., saying "you always want to have it your way" or "you just want attention"). Or they may look for explanations of behavior aimed at finding peace in the difficult situation, rather than at staying open to what the child may be going through at that moment (e.g., "You are tired, it is time for your nap" when actually the child is frustrated because he is not allowed to touch something in the room). This tendency may be associated with parental experiential avoidance, which is an inability to tolerate their own internal distress in difficult parenting situations (Tiwari et al., 2008). Parental experiential avoidance may cause intrusive behavior in parents that is aimed at reducing the child's distress or behavior, and thereby reducing the parent's distress. In the Mindful with your baby/toddler training, mothers practice awareness in situations that are stressful for them and learn to notice not only their thoughts and feelings in such a situation, but also their tendency to act and deal with these feelings. They are also invited to become aware of "not knowing" why the child acts like he does or "not understanding," and the distress that this may give, and to practice accepting this "not knowing."

So possibly, the capacity to stay present in a non-judgmental way in the face of difficulty underlies both the improvement in acceptance and in nonattuned mind-related comments. On the other hand, the other dimension of mind-mindedness, appropriate mind-related comments, which did not improve in the current study, may be more related to encapsulate traditional notions of engagement, responsiveness, and sensitivity (Meins, 2013; Zeegers et al., 2017). The question is whether there was no change in the extent to which mothers were inclined to interpret their child's behaviors in terms of underlying mental states, or whether mothers did not verbalize these mind-related comments more often. In the watching meditation in which mothers practiced focusing their full attention to the child, they also practiced in reflecting on the experience of the child, but they were not invited to immediately verbalize these reflections. This is an important difference between mindful parenting training and a mentalization-based parenting program: the first focuses on awareness, while the latter focuses on the verbalizing emotions, intentions, and desires of the child (Sadler et al., 2006).

The mothers in the present study had proportions of nonattuned mind-related comments of 2–3% at waitlist and pretest, and 5% of the comments were classified as appropriately mind-related. In terms of frequencies, mothers made on average six appropriate mind-related comments and two to three nonattuned comments during a play session at the waitlist and pretest measurement. At posttest, mothers' proportions of nonattuned comments decreased to 1% (frequency of 1 comment). Appropriate mind-related comments were still 5% (frequency of six comments). Unfortunately, there are no clinical or non-clinical norms of mind-mindedness available. We compared the mind-mindedness of the mothers in the

present study with a non-clinical sample of Dutch mothers, who were living in the same urban area and had similar socioeconomic backgrounds ($n = 116$; Zeegers et al., 2018). In this study, proportions of nonattuned and appropriate mind-related comments at 12 months were 1% and 7%, respectively. These numbers indicate that at posttest, mothers' mean levels of nonattuned mind-mindedness decreased to levels comparable in a non-clinical sample.

Turning to the results on dyadic synchrony, we found that children (both infants and toddlers) showed more vocalization after the mother vocalized, suggesting that they became more responsive to their mothers. These results may be explained better when considering the outcomes for mothers. That is, although non-significant, we found that mothers tended to show less responsiveness after the training ($p = 0.087$; small effect), possibly because they became less (over)reactive. We checked whether mothers talked less to their children from pre- to posttest. This was not the case. On average mothers made 127 comments both at pretest and posttest. Thus, it seemed that not mothers' overall talk, but specifically their prompt reaction to the child's vocalization decreased. These outcomes suggest that maternal reactivity decreased. Possibly, children showed more responsiveness at posttest because they experienced more "space" to react upon their mothers. There were no changes in the co-occurrences of positive facial expressions and gazing.

We studied the effects of the training for all training groups together, regardless of the age of the children. Our rationale was that both the baby and toddler training aim to reduce parenting stress and improve the quality of the mother-child relationship using the same methods: mindfulness meditation, watching meditation, psycho-education, and inquiry. We therefore hypothesized that in both baby and toddler groups maternal mind-mindedness, sensitivity, acceptance, and turn-taking behavior and dyadic synchrony would increase. Furthermore, by investigating the outcomes of the baby and toddler groups together, we increased statistical power. In order to study whether the training effects were different for the baby and toddler groups, we added interaction effects (Group \times Posttest) to the multilevel models. These interaction analyses did not show that effects were different for mother-baby and mother-toddler dyads. However, future studies should replicate the present study, including a larger sample, in order to study possible differences in baby versus toddler groups in more detail.

A large proportion of the current study sample (almost 70%) was diagnosed with mood or anxiety disorders. These disorders are risk factors for mother-child interaction problems (Nicol-Harper et al., 2007; Bernard et al., 2018). However, treating maternal depression does not necessarily improve mother-child interaction (Forman et al., 2007; Kersten-Alvarez et al., 2011). A meta-analysis on the effectiveness of mindfulness-based interventions in participants with mood or anxiety disorders showed large effect sizes of mindfulness interventions on symptoms of anxiety and depression (Hofmann et al., 2010). Earlier studies on the effectiveness of the Mindful Parenting training in general (Bögels et al., 2014; Meppelink et al., 2016) and the Mindful with your baby/toddler training (Potharst et al., 2017; Potharst et al., 2018) showed that even if a mindfulness

training is focused on parenting, it also decreases parental internalizing psychopathology. The behavior changes observed in this study imply that Mindful with your baby/toddler may be a suitable intervention for mothers who suffer from internalizing psychopathology and also experience problems in interaction with their baby or toddler, as both mother and child may profit from a Mindful with your baby/toddler training.

Limitations and Future Directions

Some caution is warranted in interpreting the results. First of all, although the results of the waitlist period seem to suggest that the significant effects can be attributed to the training, conclusions about causality are limited by the lack of a randomized control group. Second, the effects of the training may be less generalizable to the entire population of Dutch mothers with stress. Mothers were referred to this training by general practitioners, midwives, a mental health care providers, or mothers signed up for the training themselves. All mothers were aware that they experienced parenting stress and were willing to learn mindfulness in order to learn to cope with their stress differently. It is unclear whether the selection of the present study's participants affected the treatment outcomes.

Third, the age of the children that were included in this study varied, ranging from 4 months to 3.5 years. This relatively broad age range could have influenced the scoring of the different mother–child observations, particularly the scoring of maternal acceptance and sensitivity. That is, certain parenting behaviors were shown during mother–toddler observations only. For instance, boundary-setting behavior occurred during the mother–toddler interactions but hardly occurred during the mother–infant interactions. This means that sensitive and accepting behavior could have a different appearance depending on the age of the child. The training may have had an effect on parenting behaviors that were more likely to appear in the mother–toddler interactions than in the infant–mother interactions. We aimed to make the coding as unbiased as possible by double coding the recordings and blinding the observers to the measurement condition (waitlist/pretest/posttest). However, the age differences between the children could have biased the coding of sensitivity and acceptance.

Research studying observational effects of mindful parenting interventions is yet scarce. This study was the first to examine post-intervention changes in observed maternal sensitivity, mind-mindedness, and parent–child synchrony. With regard to future research, it might be interesting to compare the observed effects of the Mindful with your baby/toddler training with other interventions, such as a mentalization-based parenting program, and compare the outcomes of these interventions. We also recommend measuring the long-term effects of the Mindful with your baby/toddler training on observed changes in behavior, since mindfulness skills may require time for consolidation, independent practice, or generalization to the context of the parent–child interaction. Second, because of the limited sample size, we could not study the moderating or mediating effects of some variables. Analyses would have been seriously underpowered (Snijders and Bosker, 2012). This leaves a few questions unanswered. First of all, the present study

did not take into account the influence of mother and child characteristics (e.g., temperament) that are known to – additively and interactively – contribute to parenting behavior (Achtergarde et al., 2015). Most important, while all mothers in this study suffered from elevated levels of stress, most mothers were also diagnosed with an anxiety disorder, depression, or PTSD. These (different) mental health problems could lead to differential effects of the training. Note, however, that Mindful with your baby/toddler has a transdiagnostic approach – the training is focused on changing repetitive, inflexible, distress-producing ways of thinking, perceiving, and behaving that are implicated in many disorders (e.g., anxiety, depression, posttraumatic stress, substance use, sleep disturbance, eating disorders, and chronic pain conditions; Greeson et al., 2014). We recommend that the present study is replicated in a larger sample of mother–child dyads in order to get a better understanding of whether and how mother and child characteristics influence the effects of the Mindful with your baby/toddler training.

Second, previous results suggest that a focus on the mental and emotional life of their child might give parents greater insight into the child's behavior, thereby making it more comprehensible, meaningful, and predictable, and thus less likely to induce parenting stress (McMahon and Meins, 2012). This means that improvements in mindful parenting or mind-mindedness may moderate changes in maternal stress. To study these questions we recommend that the present study is replicated in a larger sample of mother–child dyads in order to get a better understanding of the working mechanisms of the Mindful with your baby/toddler training.

CONCLUSION

The present study evaluated whether the Mindful with your baby/toddler training led to observed changes in maternal behavior and mother–child interactions. Mothers were found to be more accepting and show less nonattuned mind-related comments after the training, whereas children showed higher levels of responsiveness. These observational outcomes suggest that the Mindful with your baby/toddler training resulted in more accepting behavior, better attunement to child's mental world, and more “space” for children to respond to their mothers during interactions. The Mindful with your baby/toddler training may be a suitable intervention for mothers who show a combination of parental stress, internalizing symptoms, problems in the parent–child interaction, and/or child regulation problems.

ETHICS STATEMENT

The study was approved of by the Ethical Commission of the University of Amsterdam. All participants gave written informed consent.

AUTHOR CONTRIBUTIONS

MZ, EP, IV, EA, SB, and CC contributed to the design of the study. MZ did the statistical analyses. EP developed the trainings.

EP and IV were the mindfulness trainers. MZ, IV, MG, and CC contributed to data collection. MZ, CC, and EP supervised data collection. MZ wrote the manuscript. All authors contributed to manuscript revision.

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The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Do Less Mindful Mothers Show Better Parenting via Improvements in Trait Mindfulness Following a Military Parent Training Program?

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Parental deployment to war poses risks to children's healthy adjustment. The After Deployment Adaptive Parenting Tools (ADAPT) program was developed for post-deployed military families to promote children's well-being through improving effective parenting. ADAPT combines behavior management with emotion socialization skills for parents, using brief mindfulness practices to strengthen emotion regulation. We used a three-wave longitudinal, experimental design to examine whether ADAPT improved parental trait mindfulness (PTM), and whether the effect was moderated by baseline PTM. We also investigated whether improved PTM was associated with behavioral, cognitive, and emotional aspects of parenting such as self-reported parental locus of control (PLOC), self-reported parental emotion socialization (PES), self-reported and observed behavioral parenting skills. We analyzed data from a randomized controlled trial (RCT) of the ADAPT, with a focus on mothers ($n = 313$) who were either deployed (17.9%) or non-deployed and partnered with a husband who had been recently deployed to Iraq and/or Afghanistan and returned (82.1%). Families identified a 4–13-year-old target child (Mean age = 8.34, $SD = 2.48$; 54.3% girls) and were randomized into ADAPT (a group-based 14-week program) or a control condition (services as usual). At baseline, 1-year, and 2-year follow-up, PTM, PLOC, PES, and parenting skills were self-reported, whereas home-based family interactions involving parents and the child were video-taped and assessed for observed behavioral parenting skills such as discipline and problem-solving using a theory-based coding system. Results showed that mothers with lower baseline PTM reported higher PTM at 1-year while mothers with higher baseline PTM reported lower PTM at 1-year. PTM at 1-year was associated with improved self-reported parenting skills and supportive PES at 2-year, as well as indirectly associated with improved PLOC and reduced nonsupportive PES at 2-year through PTM at 2-year. No associations between PTM and observed parenting skills were detected. We discuss the implications of these findings for incorporating mindfulness practices into behavioral parenting interventions and for personalized prevention considering parents' pre-existing levels of trait mindfulness as a predictor of intervention responsiveness.

Keywords: behavioral parent training, parenting intervention, personalized prevention, emotion socialization, moderated mediation

INTRODUCTION

Since the start of the War on Terror, the lives of more than two million American children have been affected by the deployment of a parent to Iraq and Afghanistan (Department of Defense, 2016). Parental deployment is a unique family stressor that can negatively affect children's adjustment. While military children are resilient and do not necessarily show adjustment problems (Meadows et al., 2016), some evidence suggests that children of deployed parents exhibited elevated levels of risk for internalizing and externalizing behaviors (Chartrand et al., 2008; Lester et al., 2010; Pexton et al., 2018), as well as alcohol and drug use problems (Acion et al., 2013). This may be partially due to compromised parenting during stressful times including reintegration following a deployed parent's return. Parenting is a crucial protective factor for children's well-being under environmental stress, and behavioral parent training programs have shown substantial evidence in preventing child behavioral problems over the long term in at-risk samples (Sandler et al., 2011; Forehand et al., 2014). In this article, we report data drawn from a randomized controlled trial (RCT) of a parenting intervention developed for post-deployed military families. Using moderation and mediation analyses, we investigated whether less mindful mothers (i.e., those with low baseline trait mindfulness) reported improvements in trait mindfulness following intervention, at 1-year post-baseline, and whether improved trait mindfulness mediated changes in parenting outcomes at 2-years post-baseline.

PARENTING FROM A BEHAVIORAL PERSPECTIVE

Effective parenting is defined as "a broad range of functions that parents engage in to promote their offspring's accomplishment of culturally and age appropriate developmental tasks and to reduce problem behaviors" (Sandler et al., 2011). Specifically, from a social interaction learning theory perspective (see Forgatch et al., 2004), effective parenting skills involve skill encouragement to promote competencies (e.g., using praises when the child finishes homework before bedtime), limit setting and use of control strategies to discourage problematic behaviors (e.g., taking away privileges when the child comes home too late), monitoring and supervision (e.g., being aware of the child's activities in school), and effective problem solving (e.g., scaffolding the child to solve problems). In addition, effective parenting also requires positive parent-child relationships that are nurturing for child development (e.g., being positively involved with the child).

PARENTAL TRAIT MINDFULNESS AND PARENTING

Trait mindfulness refers to individual differences in the general tendency to pay attention to the present moment non-judgmentally (Brown and Ryan, 2003). Parental trait mindfulness (PTM) may be associated with effective parenting, as suggested by a growing body of literature on this topic (Conner and White, 2014; Parent et al., 2014, 2016; Riley et al., 2018).

Theoretically, PTM may be linked to better cognitive capacities, emotion regulation, and fewer psychopathological symptoms or less stress (see Tomlinson et al., 2018), which in turn may be associated with effective parenting, namely, more positive and less negative parenting (Crandall et al., 2015). Parent et al. (2016) found that PTM was indirectly and negatively associated with behavioral problems in children and adolescents through increased mindful parenting and decreased negative parenting such as intrusive and coercive parenting, hostility during parent-child interactions, and ineffective disciplines. Campbell et al. (2017) showed that PTM was positively associated with parents' acceptance, affection, and responsiveness to children's needs, and this association was mediated by reduced parenting stress.

A THIRD-WAVE COGNITIVE BEHAVIORAL APPROACH TO PARENTING INTERVENTIONS

The first-, second-, and third-wave of cognitive behavioral approaches are often considered to be distinct from each other (Brown et al., 2011). While the first-wave focused on predicting and changing maladaptive behaviors, the second-wave shifted the focus to changing dysfunctional beliefs as ways to reduce negative emotions and maladaptive behaviors; the third-wave emphasizes the awareness and acceptance of inner experiences as ways to change one's relationship to suffering. While the distinction conveys important messages about the differences in mechanisms of change theorized in these models, researchers have also argued that the distinction is philosophical and theoretical rather than technological and practical (Herbert and Forman, 2013).

From a third-wave cognitive behavioral approach, researchers have tested mindfulness-based programs for parents including the Mindfulness-Based Stress Reduction program (MBSR; Kabat-Zinn, 1990) with a focus on parents' stress, mental health, or parents' inner experiences rather than behavioral parenting (Bögels and Restifo, 2014). The central focus is on teaching parents a variety of mindfulness meditation (e.g., 45 min meditation per day for 6 days per week). While participants' parenting experiences may be discussed, no behavioral parenting skills are taught. A few RCTs have evidenced the outcomes of mindfulness-based programs for parents and their children, including reduced parental stress (Chaplin et al., 2018), improved parental mental health (Dykens et al., 2014; Neece et al., 2018), as well as reduced child behavioral problems (Neece et al., 2018). Nonetheless, many studies in this area lacked experimental designs in their evaluation, as the research field is still in its infancy, and it is unclear to what degree these mindfulness-based parenting programs are effective for enhancing behavioral parenting skills.

A different approach is to incorporate mindfulness into existing evidence-based behavioral parent training programs (e.g., Dawe and Harnett, 2007; Coatsworth et al., 2010; Whittingham et al., 2016; Lengua et al., 2018). Because many behavioral parent training programs target several putative mechanisms all at once, for example, to improve parenting and at the same time to reduce barriers (e.g., mental health problems or stress) to using parenting skills (Sandler et al., 2011), there is an

opportunity for the integration of mindfulness into a parenting intervention that is focused on teaching parents to use behavioral strategies in parenting. We choose to call such programs mindfulness-informed parenting interventions (e.g., Zhang et al., 2018a). Instead of focusing on meditation, these programs teach mindfulness exercises to enhance parental emotion regulation and attention, reduce reactivity, and promote compassion for the child, in addition to what is typically taught in a behavioral parent training program (e.g., relationship, management of children's behaviors). Because in each session only limited time is available for teaching mindfulness, and participants have other parenting-related assignments for their home practice, these programs often use relatively brief, low dose mindfulness exercises (e.g., 5 or 10 min). Emerging evidence suggests the promise of mindfulness-informed parenting interventions. For example, Coatsworth et al. (2015) reported findings from a three-arm randomized trial, comparing the Mindfulness-Enhanced Strengthening Families Program (MSFP 10-14) to the original Strengthening Families Program 10-14 and a control condition. Their results demonstrated benefits to incorporating mindfulness practices on improved mindful parenting, parent-child relationships, and effective monitoring among fathers (measured via parents' or youth' reports).

AFTER DEPLOYMENT ADAPTIVE PARENTING TOOLS/ADAPT PROGRAM

After Deployment Adaptive Parenting Tools (ADAPT) is a mindfulness-informed, web-enhanced parenting program for post-deployed military families (Gewirtz et al., 2011; Pinna et al., 2017). Based on social interaction learning theory, ADAPT retains the key components of the Parent Management Training—Oregon model (PMTO), an evidence-based behavioral parent training program developed to prevent child conduct problems (Forgatch and Gewirtz, 2018). Some major modifications of the ADAPT program (see Pinna et al., 2017) include providing low doses of mindfulness practice for parent emotion regulation and emotion socialization (which involves frequent emotion discussions, teaching the child about what emotions are and how to regulate them and express them in a way that is appropriate given the child's developmental stage; see Fabes et al., 2002). ADAPT is now available in multiple formats and dosages, but in this study we evaluated, using a RCT, a 14 session group-based format of the program. In each session, a brief mindfulness exercise is introduced and is then assigned as part of the home practices for that week. Throughout the program, a variety of mindfulness exercises (lasting between 2 and 20 min) are taught, including body scan, sitting and observing, loving kindness, and mindful yoga (for more details, see Zhang et al., 2018a). The purpose of these exercises is to enhance parental emotion regulation rather than promote mindful parenting *per se*. Previous studies have shown that ADAPT was effective in improving observed couple parenting skills and child adjustment (Gewirtz et al., 2018), parenting self-efficacy (Piehler et al., 2018), and parental emotion socialization (Zhang et al., 2018b).

To date, no studies have yet examined whether the ADAPT increased PTM and how increased PTM might relate to intervention effects on improved parenting. Zhang et al. (2018a) analyzed the parents in the intervention group, finding that mothers' engagement in online mindfulness home practices in the ADAPT was associated with increased PTM at 6-month, but overall engagement was low. It is unknown whether parents randomized into the intervention showed increased PTM relative to those assigned to the control condition, and whether increased PTM would mediate the intervention effects on parenting outcomes. Just one experimental study has conducted a mediation analysis for an outcome measure of parent-child relationship quality: Coatsworth et al. (2010) reported a pilot RCT and found that the MSFP 10-14 showed intervention effects on parent-youth relationships at post-test indirectly through changes in mindful parenting. No published intervention studies have used an experimental design to test whether PTM was responsible for improved parenting outcomes over a longer term.

THE CURRENT STUDY

Given prior research indicating the benefits of mindfulness for self-regulation (Tomlinson et al., 2018), and literature showing that effective parenting requires self-regulation (Dix, 1991; Crandall et al., 2015), we were interested in whether improvement in PTM might be a mediator for improved parenting in ADAPT. We did not expect an intent-to-treat (ITT) intervention effects on PTM, because the dosage and parents' engagement were low. We expected that the improvements would vary depending on baseline PTM levels, i.e., a moderated effect. Because preventive interventions often demonstrate most of their impacts for subgroups with poorer functioning when they enter the program (Tein et al., 2004; Howe et al., 2016), our first hypothesis is that mothers with lower levels of baseline PTM would show more improvements in PTM at 1-year if they were assigned to the ADAPT. Our second hypothesis is that program induced improvements in PTM at 1-year would mediate improvements in parenting at 2-year. In the current study, we measured several aspects of parenting in mothers: self-reported and observed parenting skills, self-reported parenting self-efficacy, and self-reported parental emotion socialization (PES).

Mothers are primary caregivers, and in particular, they are more likely to be the non-deployed parents in military families. We excluded fathers from the current study based on earlier findings showing no significant main or within intervention group effects of ADAPT on fathers' PTM, as well as no significant main effects on observed fathers' parenting or emotion socialization at posttest or 1-year. These are consistent with other studies showing gender differences in benefits of trait mindfulness following interventions (Rojiani et al., 2017).

METHODS

Sample

We analyzed data collected from 313 mothers and their families who participated in an RCT of ADAPT (see Gewirtz et al., 2018 for the detailed information on the participant composition).

Most mothers were non-deployed (82.11%) but partnered with a male National Guard/Reserve service member who had been deployed to Iraq and/or Afghanistan. Of the 56 deployed mothers (17.89%), 71.43% had been deployed for a cumulative length of <18 months and 73.21% had been deployed once. They were predominantly European Caucasian (91.37%) and non-Hispanic (93.29%), married (87.86%), and on average aged 35.69 years (range = 23.05–51.15, $SD = 5.90$). Their socio-economic status was mostly middle-to-upper class (42.8% of families reported annual household income between \$40,000 and \$79,999, and 30.2% between \$80,000 and \$119,999). Half of them reported having at least a bachelor's or higher degree (51.44%), and 39.63% attended to a community college or had an associate degree. All families had a target child in the study. The children were on average 8.39 years old (range = 4.06–13.86, $SD = 2.52$) at study entry, and about half were girls (53.6%).

Procedures

A CONSORT flowchart is shown in **Figure 1**. Families were eligible to participate in the study if at least one parent had been deployed to Afghanistan and/or Iraq since 2001, and at least one child was 4–13 years old. Participants were recruited using multiple strategies: presentations at military events, postings on social media, flyers, and word of mouth. Interested families completed an online survey to be screened for eligibility. Of the 336 families enrolled, 272 families had two parents participating in the study and 64 families had only one parent participating (41 mothers and 23 fathers). Families completed baseline online surveys and in-home assessment, and subsequently were randomized to the ADAPT intervention (60%) or a control condition (services as usual; 40%) (computer-generated randomization). Families in the control condition were emailed a list of “tip sheets” and online parenting resources shortly after their completion of the baseline assessment. After completing the intervention, parents received online links to surveys at 6 months as post-test. Online surveys and in-home assessments were conducted at 1-year and 2-years follow-up. Each parent received a \$25 gift card for their completion of an online survey as well as a \$50 gift card for the completion of an in-home assessment. All procedures were approved by the University of Minnesota's Institutional Review Board. Before the study was conducted, written informed consent was obtained from all adult participants. Children provided assent while their parent provided written consent.

Intervention

The program consisted of 14 sessions, delivered by 2–3 trained facilitators weekly in groups of 6–15 parents. The intervention was led by two to three facilitators who were Master's level practitioners in any human services field including (but not limited to) social work, psychology, school counseling. They received extensive training prior to implementing the intervention and who received ongoing consultation throughout the study. Each session lasted about 2 h. Six parenting skills were taught, including skill encouragement, positive involvement, problem-solving, monitoring, discipline, and emotion socialization, with the first five domains rooted

in the PMTO model (Gewirtz et al., 2014). Each session built on the knowledge and skills taught in the prior session, with active teaching tools including role-play and practice of skills, and discussion with other participants. Two key innovations of ADAPT, rarely addressed in prior skill-based parent training programs, were mindfulness and emotion coaching. Mindfulness was integrated into the ADAPT to enhance parental emotion regulation and to facilitate emotion coaching of children (see, Kehoe and Havighurst, 2018). Emotion coaching is a construct in the meta-emotion philosophy (Gottman et al., 1996), which suggests that parents as emotion coaches are aware of their own and their children's emotions (likely facilitated by better PTM), view negative emotions as opportunities for intimacy or teaching, can discuss emotions and help their children to understand and regulate emotions. Facilitators guided the manualized mindfulness exercises in each session, which included mindful eating, body scan, and 10 deep breaths, etc. Each exercise took 2–20 min. Participants received handouts including tips for mindfulness practice and home practice assignments. Online mindfulness exercises were also available for parents to practice outside of the group sessions.

Intervention fidelity was observed via videotapes of sessions, and coded according to facilitator knowledge, structure, teaching, process, and overall skills. Videotapes of group sessions were used to provide coaching to facilitators. Almost all content was covered (>90%). As coverage of content is core to the fidelity model, it was checked weekly in coaching sessions using the videotapes of the sessions. A total of 27 intervention groups were run, with an average size of 6–10 families per group.

Attendance and engagement data have been documented in prior reports (Doty et al., 2016; Pinna et al., 2017) and are briefly described here. Among the 207 families in the intervention group (60% of the whole sample), 156 families attended at least one group session whereas 19 families did not attend group but accessed the web-based program of ADAPT (which was designed to assist parents' engagement in the program especially if they did not attend in-person groups). Among those who attended group sessions, at least one parent in the family attended 70.66% ($SD = 27.16\%$) of the total sessions on average. Families who attended group sessions completed 63.45% ($SD = 27.86\%$) of the total home practice assignments.

Measures

Group Assignment

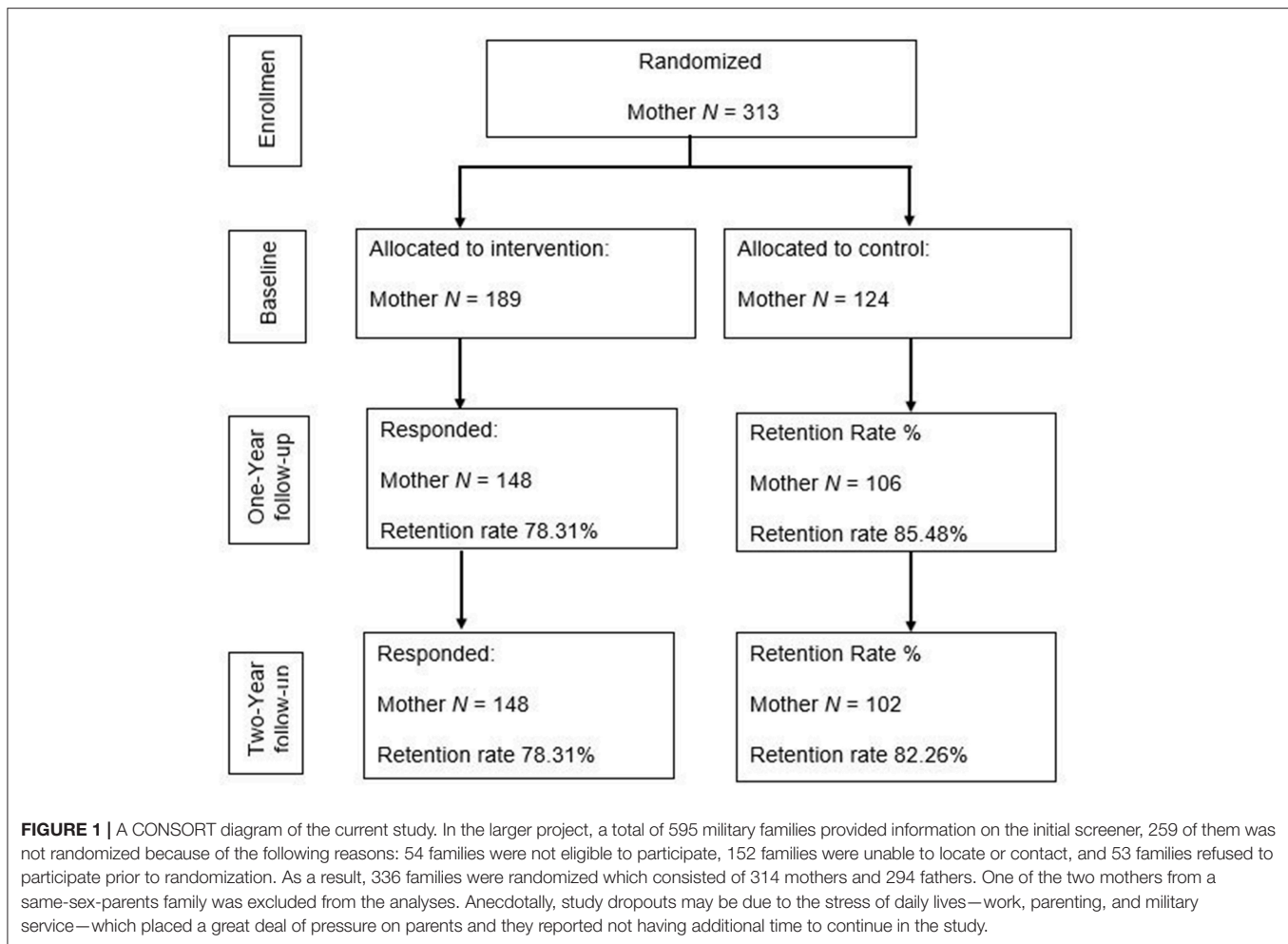
Group assignment was dummy-coded as 1 = ADAPT and 0 = control condition.

Demographic Variables as Covariates

Mothers' deployment status (whether they had been deployed to Iraq and/or Afghanistan; 0 = nondeployed, 1 = deployed), education, age, and marital status (0 = single, 1 = married), as well as target child's age and sex (0 = boy, 1 = girl) were controlled.

Parental Psychological Distress and Negative Life Events as Covariates

Parental post-traumatic stress symptoms and negative life events were entered as covariates. The Post-Traumatic Stress Checklist



(PCL; Weathers et al., 1993) was used to assess parents' post-traumatic stress symptoms. Deployed parents completed the military version (PCL-M), and nondeployed parents completed the civilian version (PCL-C). Each version consisted of 17 items, which were rated on a 5-point scale ranging from 1 (not at all) to 5 (extremely). The composite scores were obtained, and a dichotomous variable was then created to indicate a likely diagnosis of post-traumatic stress disorder (PTSD) status based on the clinical cutoff criteria. Parents who met the clinical cutoff criteria were coded as 1, while parents who did not meet the criteria were coded as 0. In the current sample, 6.39% percent of mothers met the criteria at baseline. The Life Events Questionnaire (LEQ; Sarason et al., 1978; Norbeck, 1984) was used to measure parents' negative life events occurring in the past year, whether each event was perceived as positive or negative, and how strong the effect was. The total counts of negative events were used in the analysis.

Parental Trait Mindfulness (PTM)

The Five Facet Mindfulness Questionnaire (FFMQ; Baer, 2006) was used to measure parents' trait mindfulness at baseline, 1, and 2-year follow-up. The FFMQ is a widely used instrument for

assessing trait mindfulness with good internal consistency and validity (Baer et al., 2008). The scale consists of 39 items which address five dimensions of trait mindfulness: (1) observing (e.g., "When I take a shower or bath, I stay alert to the sensations of water on my body."); (2) describing (e.g., "I'm good at finding words to describe my feelings."); (3) acting with awareness [e.g., "I rush through activities without being really attentive to them." (reverse coded)]; (4) non-judging of inner experience [e.g., "I make judgments about whether my thoughts are good or bad." (reverse coded)]; and (5) non-reactivity to inner experience (e.g., "I watch my feelings without getting lost in them."). Each item was rated on a 5-point scale (1 = "never or very rarely true," 5 = "very often or always true"). The composite scores were used such that higher scores indicate higher levels of mindfulness. Possible range of scores for composite FFMQ is 39-195. The Cronbach's α s at baseline, T3, and T4 were 0.90, 0.92, and 0.92 for the current sample.

Supportive and Nonsupportive Parental Emotion Socialization (PES)

Supportive and nonsupportive parental emotion socialization (PES) practices were measured with the Coping with Children's

Negative Emotions Scale (CCNES; Fabes et al., 1990) at baseline, 1, and 2-year follow-up. The CCNES is a widely used scale with adequate internal consistency and reliability (Fabes et al., 2002). Mothers were asked to endorse their responses to 12 scenarios in which children may experience negative emotions, such as fear, anger, and sadness. The scale has six subscales: emotion-focused reaction (e.g., EF; “try to make my child happy by talking about the fun things we can do with our friends”), problem-focused reaction (e.g., PF; “tell my child that the present can be exchanged for something the child wants”), expressive encouragement (e.g., EE; “encourage my child to talk about his/her fears”), minimization reaction (e.g., MR; “tell my child to quit over-reacting and being a baby”), punitive reaction (e.g., PR; “tell my child to straighten up or we’ll go home right away”), and distress reaction (e.g., DR; “get upset with him/her for being so careless and then crying about it”). For each reaction under each scenario, parents responded the likelihood they would react to their children on a 7-point Likert scale (1 = very unlikely; 7 = very likely). The Cronbach’s α s at baseline, 1-year, and 2-year follow-up were above 0.87 for unsupportive subscale, and the Cronbach’s α s at baseline, 1-year, and 2-year follow-up were above 0.90 for supportive subscale. For this report, we conducted principle component analysis using SPSS 25.0 (IBM Corp, 2017) and created factor scores for nonsupportive PES (from PR, MR, and DR) and for supportive PES (from PF, EF, and EE).

Parenting Self-Efficacy (PLOC)

Parenting self-efficacy (PLOC) was measured through the Parenting Locus of Control-Short Form Revised (PLOC-SFR; Hassall et al., 2005) at baseline, 1, and 2-year follow-up. It consists of 24 items measuring four domains: parental efficacy (e.g., “I am often able to predict my child’s behavior in situations”), parental responsibility (e.g., “When my child is well-behaved, it is because he/she is responding to my efforts”), child control of parents’ life (e.g., “I feel like what happens in my life is mostly determined by my child”), and parental control of child’s behavior (e.g., “I always feel in control when it comes to my child”). Parents were asked to rate on a 5-point Likert scale (1 = “strongly agree,” 5 = “strongly disagree”). A composite score was created with higher score indicating internal LOC, while lower score indexing external LOC. The Cronbach’s α s at baseline, 1, and 2-year follow-up were 0.75, 0.76, and 0.78 in the current sample.

Self-Reported Parenting Skills (APQ)

The short form of Alabama Parenting Questionnaire (APQ-9; Elgar et al., 2007) was used to measure parenting skills at baseline, 1, and 2-year follow-up. The short scale has shown adequate internal consistency and criterion validity, and has linked to child disruptive behavioral problems (Elgar et al., 2007). It consists of 9 items measuring parenting skills in three domains: positive parenting (e.g., “You compliment your child after he or she has done something well”), inconsistent discipline (e.g., “Your child talks you out of being punished after he or she has done something wrong”), and poor supervision (e.g., “Your child is out with friends you don’t know”). Parents were asked to rate the likelihood of each behavior on a 5-point Likert scale (1 = “never,” 5 = “always”). A composite score was created with higher score

indicating more positive parenting behaviors. The Cronbach’s α s were marginally acceptable in the current sample at baseline, 1, and 2-year follow-up were 0.60, 0.63, and 0.71, respectively.

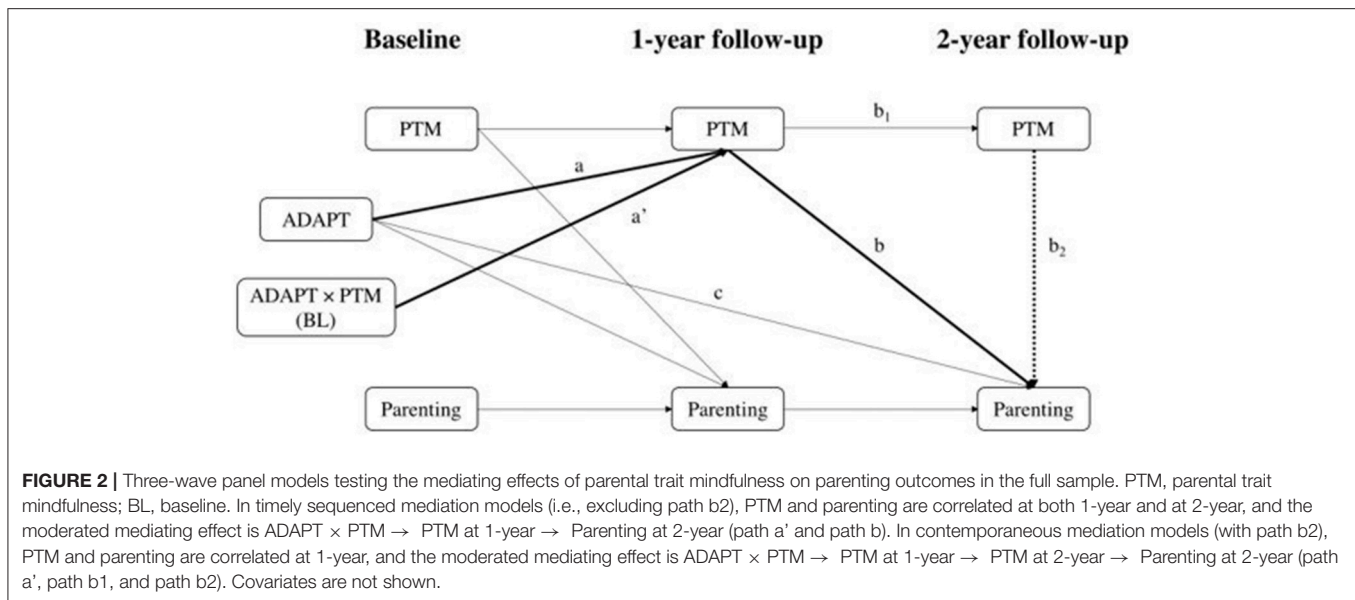
Observed Parenting Skills (FITs)

Structured family interaction tasks (FITs) were conducted to obtain direct observations of parent-child interactions. Parents and children (father-child, mother-child, father-mother-child) were asked to complete a series of tasks, including problem-solving tasks (e.g., homework, cleaning bedrooms, bedtime, etc.), deployment-related discussions, monitoring, teaching (playing games under parents’ instructions), and fun family activities. The interaction tasks lasted for approximately 40 min, and were videotaped for further coding. Observers, who were blind to the intervention conditions, coded the FITs using a Coder Impressions System (Forgatch et al., 1992), which is a macro coding system assessing both verbal and non-verbal parenting skills. The majority of the coders were undergraduate research assistants who were trained for 60 h in group training sessions led by a senior coder. Biweekly reliability meetings were held immediately following training to minimize observer drift. Twenty percent of the videos were randomized selected to assess inter-rater reliability at each time point using intraclass correlation coefficients (ICCs).

Five indicators were used to measure parenting skills: (1) problem-solving, (2) skill encouragement, (3) monitoring, (4) harsh discipline, and (5) positive involvement. The FITs scales have demonstrated adequate construct validity in prior studies (Forgatch and DeGarmo, 1999). Problem-solving was rated on a nine-item scale to evaluate the quality of the parent-child solution, the likelihood of the family putting the solution to use, extent of resolution, and the satisfaction at the discussion outcomes ($\alpha = 0.87-0.89$; ICC = 0.88–0.94). Skill encouragement was rated on an eight-item scale to evaluate parent’s ability to promote children’s skill development through encouragement and scaffolding strategies ($\alpha = 0.76-0.83$; ICC = 0.72–0.76). Monitoring was rated on a four-item scale to evaluate parents’ supervision and knowledge of their child’s daily activities ($\alpha = 0.60-0.71$; ICC = 0.74–0.64). In these three scales, items were rate on a 5-point Liker scale from 1 to 5 (1 = “untrue,” 5 = “very true”). Harsh discipline was rated on an eight-item scale to evaluate overly strict, coercive, authoritarian, inconsistent parenting behaviors ($\alpha = 0.75$; ICC = 0.58–0.78). Positive involvement was rated on a 10-item scale to evaluate parents’ warmth, empathy, affection, and encouragement toward their children ($\alpha = 0.75-0.76$; ICC = 0.76–0.84). Items in the last two scales were rated on a 6-point Likert scale from 1 to 6 (1 = “never,” 6 = “always”). A composite score was created among the 5 indicators with high score reflecting more effective parenting.

Analytical Strategy

Data analyses were conducted in several stages: first, bivariate correlations were computed for key variables and *t*-tests were used to detect baseline differences on key variables between the intervention and control group. Second, in a multiple regression model, the ITT effects on PTM at 1-year follow-up were tested, and whether baseline PTM moderated the intervention effects



was also tested by adding baseline PTM and an interaction effect (group assignment × baseline PTM) to the model. If the moderation effect were significant, the interaction effect would be added to mediation models in the following steps testing moderated mediation.

Third, we computed path models from a structural equation modeling framework to test whether improved PTM at 1-year (moderated by baseline PTM) mediated the program effects on parenting outcomes. We used path analyses with three waves of data (Figure 2) which specify the lagged correlations within each of the PTM and parenting variables across times. Such path analyses not only helps to account for the correlations between PTM and parenting both cross-sectionally and longitudinally, but they also temporally separates the measures through the time lags, which helps to reduce common method biases when all measures were self-report (Podsakoff et al., 2003). The hypothesized moderated mediation path was $a' \times b$ (timely sequenced mediation) or $a' \times b_1 \times b_2$ (contemporaneous mediation). Contemporaneous mediation is useful when timely sequenced mediation is not detected because of reasons such as the lagged effect of PTM on parenting does not align with the measurement times in the study (Gollob and Reichardt, 1987). To determine if there was evidence supporting a mediation effect, we used the joint significant test, which is the preferred method for hypothesis testing as it controls Type I error well and has good statistical power (MacKinnon et al., 2002; Taylor et al., 2008); there is evidence for mediation if each of the paths in the mediated effect is significantly different from zero (Taylor et al., 2008). We did not test the intervention effects on parenting outcomes because mediation effects can exist in the absence of a direct effect (Shrout and Bolger, 2002).

All models were computed in Mplus 8 (Muthén et al., 1998–2017). Model fit was evaluated using recommended criteria (McDonald and Ho, 2002), including chi-square ratio (below 2.0), comparative fit index (CFI; above 0.95), standardized root-mean-square residual (SRMR; below 0.08),

and root-mean-square error of approximation (RMSEA; below 0.06). A set of covariates were included such as mothers' age, education, income, years of marriage, deployment status, PTSD status, stressful life events, child age/sex, and number of children for variables at 2-year follow-up. When model fit indices were not optimal, we removed covariates that were not significantly correlated with outcome variables and/or added a path from parenting at baseline to parenting at 2-year follow-up to improve model fit indices.

Missing Data

Data was missing due to reasons such as nonresponse, technical problems during in-home observation, and attrition at 1-year and 2-year follow-ups. In the current sample, the amount of missing data on variables ranged from 0 to 5.43% at baseline, 19.82–25.63% at 1-year follow-up, and 20.76–30.35% at 2-year follow-up. No demographic variables were significantly predictive of the study variable at any time point. Little's MCAR test was computed including all study variables and covariates and results supported missing at random, $\chi^2_{(573)} = 594.39$, $p > 0.05$. Thus, we used Full Information Maximum Likelihood (FIML) in Mplus to handle missing data. FIML is considered less biased in comparison to other methods of dealing with missing data (Schafer and Graham, 2002).

RESULTS

Preliminary Analyses

Bivariate correlations, means, and standard deviations of key variables are shown in Table 1. To summarize, PTM measures were strongly correlated across times ($r_s = 0.74$ – 0.81). Self-reported parenting measures were moderately correlated across times ($r_s = 0.56$ – 0.74). Observed parenting skills showed weaker correlations across times ($r_s = 0.24$, 0.31 , and 0.51). PTM measures were weakly-to-moderately correlated with

TABLE 1 | Correlations, means, and standard deviations of key variables.

Study variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. FFMQ BL	–																	
2. FFMQ 1-y	0.76	–																
3. FFMQ 2-y	0.74	0.81	–															
4. CCNES(sup) BL	0.23	0.21	0.19	–														
5. CCNES(sup) 1-y	0.20	0.09	0.18	0.65	–													
6. CCNES(sup) 2-y	0.25	0.31	0.29	0.58	0.67	–												
7. CCNES(non) BL	–0.21	–0.16	–0.20	–0.18	–0.12	–0.14	–											
8. CCNES(non) 1-y	–0.12	–0.09	–0.12	–0.10	–0.11	–0.05	0.65	–										
9. CCNES(non) 2-y	–0.14	–0.13	–0.24	–0.10	–0.06	–0.14	0.63	0.69	–									
10. APQ BL	0.31	0.28	0.24	0.16	0.18	0.27	–0.21	–0.16	–0.17	–								
11. APQ 1-y	0.28	0.38	0.32	0.21	0.13	0.23	–0.32	–0.26	–0.24	0.62	–							
12. APQ 2-y	0.25	0.35	0.37	0.21	0.17	0.28	–0.26	–0.17	–0.28	0.55	0.64	–						
13. PLOC BL	0.29	0.31	0.31	0.18	0.04	0.22	–0.22	–0.15	–0.12	0.32	0.35	0.36	–					
14. PLOC 1-y	0.34	0.43	0.38	0.25	0.21	0.35	–0.17	–0.23	–0.18	0.29	0.37	0.32	0.66	–				
15. PLOC 2-y	0.24	0.34	0.35	0.23	0.14	0.36	–0.20	–0.15	–0.26	0.27	0.37	0.39	0.63	0.74	–			
16. FITS BL	0.11	–0.01	0.01	–0.06	0.03	–0.01	–0.16	–0.01	–0.05	0.12	0.04	0.02	0.05	–0.05	–0.03	–		
17. FITS 1-y	0.05	0.05	0.04	–0.00	0.13	0.11	–0.11	–0.12	–0.16	0.19	0.14	0.09	0.02	0.09	0.00	0.31	–	
18. FITS 2-y	0.12	0.07	0.06	0.03	0.11	0.19	–0.15	–0.11	–0.16	0.05	0.08	0.03	–0.04	0.05	0.09	0.24	0.51	–
M	132.31	134.20	134.79	0.00	0.00	0.00	0.00	0.00	0.00	38.16	38.65	38.26	3.62	3.71	3.71	2.40	2.53	2.49
SD	17.92	17.77	18.26	0.90	0.90	0.94	0.96	0.92	0.94	3.25	3.48	3.38	0.42	0.42	0.43	0.42	0.38	0.34
Min	89.00	89.00	83.00	3.27	3.85	3.42	1.27	1.42	1.21	28.00	22.00	27.00	2.59	2.54	2.67	1.19	1.39	1.30
Max	181.00	176.00	185.00	6.82	6.82	6.82	4.33	4.24	5.09	45.00	45.00	45.00	4.76	4.79	4.92	3.31	3.61	3.29

BL, baseline; 1-y, 1-year follow-up; 2-y, 2-year follow-up; FFMQ, Five Facets Mindfulness Questionnaire; CCNES(sup), Supportive subscale of Coping with Children's Negative Emotions Scale; CCNES(non), Nonsupportive subscale of Coping with Children's Negative Emotions Scale; APQ, Alabama Parenting Questionnaire; PLOC, Parental Locus of Control; FITS, family interaction tasks (for observed parenting skills). Bolded correlation coefficients are statistically significant, Alpha = 0.05.

self-reported parenting measures but not correlated with observed behavioral parenting skills.

Results from independent *t*-tests showed that there were no significant differences detected on demographic variables, baseline FFMQ, PLOC, non-supportive PES, and FITS between the intervention and the control group. There was statistically significant difference on baseline APQ, $t = 2.11$, $df = 305$, $p < 0.05$, such that mothers in the intervention group had significantly higher levels of APQ (i.e., better parenting skills) than those in the control group. There was also statistically significant difference on supportive PES, $t = 2.42$, $df = 266$, $p < 0.05$, such that mothers in the intervention reported higher levels of supportive PES than those in the control group.

Moderated Intervention Effects on PTM

In a multiple regression model, the ITT effects on improved PTM were tested at 1-year follow-up, controlling for covariates as well as baseline PTM. Control variables were mothers' age, education, annual household income, years of marriage, and deployment status (1 = deployed; 0 = non-deployed). Consistent with our expectations, no significant ITT effects were found for PTM at 1-year. After baseline PTM and the interaction effect (baseline PTM by intervention) were added to the model, there was a statistically significant moderation effect ($B = -0.20$, $SE = 0.08$, $\beta = -0.16$, $p < 0.05$). Consistent with the hypothesis,

region of significance (Figure 3) showed that mothers with lower levels of baseline PTM reported significantly higher PTM at 1-year if they were randomized into the intervention vs. control condition. On the other hand, a subgroup of mothers with higher levels of baseline PTM reported significantly lower PTM at 1-year if they were randomized into the intervention vs. control condition. Specifically, mothers who scored lower than 103 on the FFMQ ($Z = -1.63$ in the current sample; $Z = -0.72 \sim -0.31$ in a typical community sample, Goldberg et al., 2016) pre-intervention showed significant improvements in PTM at 1-year if they were randomized into the intervention; those who scored higher than 154 on the FFMQ ($Z = 1.21$ in the current sample; $Z = 2.81 \sim 3.34$ in a typical community sample; Goldberg et al., 2016) pre-intervention showed significantly lowered PTM at 1-year if they were randomized into the intervention; and, finally, mothers whose FFMQ scores were about the mean levels of the sample, either in the intervention group or the control condition, did not show significant changes at 1-year.

Because there was a negative intervention effect for a subgroup of mothers, we conducted *post hoc* analysis to test whether intervention effects were maintained to 2-year follow-up. Results showed that no individuals in the current sample fell into the region of significance for positive or negative intervention effects for PTM at 2-year follow-up (all $ps > 0.05$), suggesting that the impacts of the intervention on PTM at 1-year for the subgroup

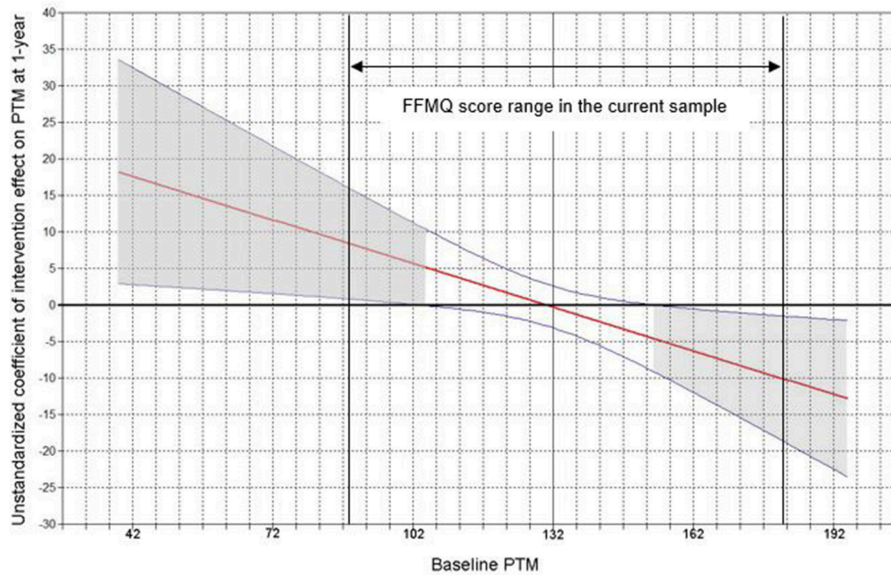


FIGURE 3 | Plot of mothers' baseline trait mindfulness as a moderator conditioning the unstandardized effect of intervention on trait mindfulness at 1-year. PTM, parental trait mindfulness. The x axis is mothers' FFMQ score at baseline (possible range: 39–195; current sample: 89–181). The y axis is the unstandardized coefficient of intervention effect (effect sizes) on mothers' trait mindfulness at 1-year. Blue curved lines are 95% Confidence Intervals. Horizontal line denotes intervention effect of 0. Regions with gray shades are of statistical significance.

of mothers with lower or higher baseline PTM disappeared at 2-year follow-up.

Moderated Mediation Effects on Parenting Outcomes

Given a significant moderated intervention effect on PTM at 1-year, we tested whether this moderated effect mediated the intervention effects on parenting outcomes. A total of five moderated mediation models were specified for PTM and each parenting outcome (Figure 2). In all models, baseline PTM consistently moderated the intervention effect on PTM at 1-year (*a'* path) in Figure 2, $p < 0.05$. Below, timely sequenced mediation effect of PTM on parenting was described first, followed by contemporaneous mediation effect.

Self-Reported Parenting Skills (APQ)

A timely sequenced mediation model demonstrated a good fit to data: $\chi^2_{(51)} = 94.91$, $p < 0.001$, $\chi^2/df < 2.00$, CFI = 0.95, RMSEA = 0.05, SRMR = 0.04. Results showed that PTM at 1-year significantly and positively predicted self-reported parenting skills at 2-years (*b* path) above and beyond past APQ scores and other covariates, $B = 0.03$, $SE = 0.01$, $\beta = 0.17$, $p < 0.01$. Therefore, mothers' higher PTM at 1-year was associated with better self-reported parenting skills at 2-year follow-up.

Supportive PES

A timely sequenced mediation model demonstrated a good fit to data: $\chi^2_{(43)} = 84.31$, $p < 0.001$, $\chi^2/df < 2.00$, CFI = 0.95, RMSEA = 0.06, SRMR = 0.04. PTM at 1-year significantly and positively predicted supportive PES at 2-year follow-up (*b* path) above

and beyond past supportive PES scores and other covariates, $B = 0.009$, $SE = 0.003$, $\beta = 0.16$, $p < 0.01$. Therefore, mothers' higher PTM at 1-year was associated with higher self-reported supportive PES at 2-year follow-up.

Non-supportive PES

A timely sequenced mediation model was computed. The model demonstrated a good fit to data: $\chi^2_{(53)} = 88.98$, $p < 0.001$, $\chi^2/df < 2.00$, CFI = 0.96, RMSEA = 0.05, SRMR = 0.03. This model showed no significant mediated effect from PTM at 1-year to non-supportive PES at 2-year (i.e., *b* path was not significantly different than zero). A contemporaneous mediation model was then computed, which demonstrated a good fit to data: $\chi^2_{(54)} = 90.98$, $p < 0.001$, $\chi^2/df < 2.00$, CFI = 0.95, RMSEA = 0.05, SRMR = 0.03. This model showed that PTM at 1-year strongly predicted PTM at 2-year (*b*₁ path), $B = 0.84$, $SE = 0.04$, $\beta = 0.82$, $p < 0.001$, and PTM at 2-year was significantly and negatively associated with nonsupportive PES at 2-year (*b*₂ path) above and beyond past nonsupportive PES scores and other covariates, $B = -0.006$, $SE = 0.002$, $\beta = -0.11$, $p < 0.05$. Therefore, while there was no direct effect of PTM at 1-year on non-supportive PES at 2-year, PTM at 1-year was associated with decreased nonsupportive PES at 2-year through PTM at 2-year follow-up.

Parenting Self-Efficacy (PLOC)

A timely sequenced mediation model was computed. After adding a path from baseline PLOC to 2-year, the model demonstrated a good fit to data: $\chi^2_{(51)} = 92.87$, $p < 0.001$, $\chi^2/df < 2.00$, CFI = 0.95, RMSEA = 0.05, SRMR = 0.05. This model showed no significant mediation effect from PTM at 1-year to

PLOC at 2-year (i.e., b path was not significantly different than zero). A contemporaneous mediation model was then computed, which demonstrated a good fit to data: $\chi^2_{(52)} = 94.67, p < 0.001, \chi^2/df < 2.00, CFI = 0.95, RMSEA = 0.05, SRMR = 0.04$. This model showed that PTM at 1-year strongly predicted PTM at 2-year (b_1 path), $B = 0.84, SE = 0.04, \beta = 0.81, p < 0.001$, and PTM at 2-year was significantly and positively associated with PLOC at 2-year (b_2 path) above and beyond past PLOC scores and other covariates, $B = 0.002, SE = 0.001, \beta = 0.11, p < 0.05$. Therefore, while there was no direct effect of PTM at 1-year on PLOC at 2-year follow-up, PTM at 1-year was associated with increased PLOC at 2-year through PTM at 2-year follow-up.

Observed Behavioral Parenting Skills

A timely sequenced mediation model was computed. The model fit indices were not optimal but acceptable: $\chi^2_{(52)} = 98.07, p < 0.001, \chi^2/df < 2.00, CFI = 0.93, RMSEA = 0.05, SRMR = 0.04$. This model showed no significant mediated effect from PTM at 1-year to observed parenting at 2-year (i.e., b path was not significantly different than zero). A contemporaneous mediation model was then computed with not optimal but acceptable model fit indices: $\chi^2_{(53)} = 100.42, p < 0.001, \chi^2/df < 2.00, CFI = 0.93, RMSEA = 0.05, SRMR = 0.04$. Still, this model showed no significant mediated effect from PTM at 2-year to observed parenting at 2-year (i.e., b_2 path was not significantly different than zero). This was not surprising given the non-significant bivariate correlations between PTM and observed parenting measures (Table 1).

DISCUSSION

Our goal was to understand for whom the intervention might be more or less beneficial depending on baseline levels of PTM (moderation analyses) as well as the mediating relationship between PTM and parenting outcomes. Our analyses revealed several findings: first, while no main effects of the intervention on self-reported PTM were found, baseline PTM was a moderator for the intervention effects. Specifically, mothers with lower levels of baseline PTM reported higher PTM at 1-year follow-up if they were randomized into the intervention vs. control condition; mothers with higher levels of baseline PTM reported lower PTM at 1-year follow-up if they were randomized into the intervention vs. control condition; and mothers with average levels of baseline PTM did not report significant changes from either condition. We note, with more details below, that mothers in the current sample reported much higher PTM before the group assignment, relative to other samples we found in the literature. Second, PTM in mothers at 1 or 2-year follow-up was associated with self-reported parenting skills (APQ), PLOC, and PES at 2-year follow-up in expected directions (effect sizes were small). No associations of PTM were found with observed parenting skills. Overall, the findings supported our hypotheses regarding self-reported parenting but not observed behavioral parenting. These findings provide important information to future theorists and interventionists in the studies of a third-wave cognitive behavioral approach to parenting.

In comparison to other studies in the literature (e.g., Baer et al., 2008; Goldberg et al., 2016), the sample in the current study scored much higher on the FFMQ. Prior samples have included diverse community samples: both female and male, a larger range of age, and different socio-economic backgrounds. The current sample is less diverse as mothers were mostly in their 30s, middle-income, White, and partnered with a male military service member. There are few studies examining socio-demographic correlates of trait mindfulness, especially among parents, though intervention studies do suggest that women may be more responsive to mindfulness training than men (e.g., Rojiani et al., 2017). Further research is needed to understand socio-demographic differences in self-reported PTM.

Our finding of no main effects of the ADAPT program on mothers' PTM is consistent with a recent meta-analysis reporting that self-reported gains in trait mindfulness following a range of mindfulness-based interventions are relatively modest compared with gains in clinical outcomes (Goldberg et al., 2018). The dosage of mindfulness in the ADAPT program was much smaller than mindfulness-based interventions: the mindfulness meditation exercises delivered in each session were very short, and participant engagement in mindfulness home practice was low (just half of the intervention condition sample accessed any of the mindfulness home practices online; Zhang et al., 2018a). This is not surprising given the context of mindfulness-informed parenting interventions: parents have many competing demands on their time, and home practice was not limited to mindfulness exercises as parents also were instructed to practice behavioral parenting techniques between sessions. Singh et al. (2006, 2007), in their evaluations of a mindfulness-based parenting intervention for mothers of children with developmental disabilities, found that reductions in child behavior problems occurred after mothers engaged in mindfulness practice.

According to results of the moderation analyses, even the relatively small doses of mindfulness practices in the ADAPT program, however, were effective for mothers who showed deficits in PTM at baseline, i.e., whose baseline FFMQ scores were below 103, which is approximately a typical civilian community sample mean (e.g., Goldberg et al., 2016). This finding suggests that even small doses of mindfulness (just a few minutes at a time) might be beneficial in boosting PTM for mothers with PTM deficits (i.e., very low self-reported observing, describing, acting with awareness, non-judging, and non-reactivity). Basso et al. (2019) found that a brief mindfulness-based intervention that requires participants to practice 13-min per day for 8 weeks were effective in decreasing negative emotions and enhancing cognitive capacities (e.g., attention, working memory) at post-test. For mothers who needed the most, the ADAPT intervention strengthened their PTM at 1-year. Strengthened PTM might help mothers to be present with their children, be less preoccupied with their own distress during parent-child interactions, and consistently use discipline or encouragement. Parents with higher levels of PTM may have better reflective functioning which helps parents to mentally represent and understand their children's internal experience while reflecting their own experience as

parents, enabling meaningful and appropriate actions in the parenting context (Slade, 2005). Mindfulness exercises taught in the ADAPT such as “sitting and observing,” “loving kindness,” “stretching” (i.e., mindful yoga activities with children), may help increase parental reflective functioning as well as PTM by increasing awareness, non-reactivity, and interpersonal attunement with child. It would seem logical, then, that these small gains in PTM would be reflected in subsequent gains in perceived parenting efficacy and both behavioral and emotional positive parenting. While we did not track whether mothers engaged in mindfulness practices during the year after the intervention, it is important to note that practices are necessary for maintaining and/or boosting positive outcomes such as improved PTM. It may be helpful to include engagement boosters or relevant resources in a mindfulness-informed parenting intervention to assist parents in continuing their practices.

We were curious regarding the finding that mothers with very high levels of baseline PTM actually reported *decreased* PTM at 1-year if they were randomized into the intervention vs. control condition, though a *post hoc* analysis indicated that such effects disappeared at 2-years. We speculate that these findings may be related to the inherent differences between behavior management and mindfulness training approaches (Duncan et al., 2009). While parent training teaches parents to identify, evaluate, and respond to children’s behaviors using reward or punishment, mindfulness practices, and principles focus on being in the present moment and allowing evaluative thoughts to pass by without clinging onto them. It is possible that highly mindful mothers, as they practiced ADAPT parenting skills, engaged in the judging that is required to respond to children’s behaviors, which caused some cognitive dissonance with their mindful mindsets. This dissonance may have been resolved by moving toward what they perceived as a more reactive and interventionist stance vis a vis their children (rather than a more mindful approach), which may have resulted in perceptions of poorer parenting efficacy and skills.

While evidence exists supporting the relationship between self-reported mindful parenting and observed parenting behaviors in mothers (Duncan et al., 2015), we did not find associations between PTM and observed parenting in our sample. Further research within a group of highly mindful mothers may help to understand what was happening during and after their participation in a behavioral parenting intervention. It is possible that the lack of goodness-of-fit between parents and programs may disadvantage parents’ own strengths (Singh, 2001). If that is the case, parents with very high levels of PTM may require a more tailored approach to learning parenting or a different approach to the sequencing of intervention components. For instance, interventions may start with mindfulness training (i.e., attention and compassion), and then frame skill encouragement and limit setting in a way that is integrated with parents’ pre-existing strength in mindfulness. Given that the current sample scored on FFMQ much higher than other community and clinical samples in the literature, behavioral measures of trait mindfulness (e.g., breath counting; Levinson et al., 2014) instead of self-reports

and/or qualitative data may be useful to further examine this issue.

On the other hand, such different findings between self-reports and observed measures of parenting are evident in the broader literature of behavioral parenting intervention (those without a mindfulness component). For instance, meta-analyses of evidence-based parenting interventions such as the Incredible Years program and the Triple P program have found significant program effects on improved self-reported parenting, but not on observed parenting (Nowak and Heinrichs, 2008; Sanders et al., 2014; Leijten et al., 2018). It is possible that observed parenting reflect some aspects of personality or psychopathology (McCabe, 2014) which are not the targets of parenting interventions. However, robust evidence including objectively measured parenting can further support the effects of evidence-based programs in addition to self-reports. Future researchers can develop new methods to measure aspects of parenting behaviors objectively that are sensitive to change. For example, instead of using structured parent-child interaction tasks, Sperling and Repetti (2018) used naturalistic observational methods in which families were recorded by two videographers on 2 week days and 2 weekend days without any prompts for particular activities or interactions.

Finally, we found evidence supporting the moderated mediation effect of PTM on all of the self-reported parenting measures, i.e., changes in PTM at 1-year as predicted by the interaction effect of intervention by baseline PTM were associated with self-reported parenting at 2-year either longitudinally or cross-sectionally through PTM at 2-year. While the mediation effects were statistically significant according to the joint significance test, the effect sizes of the associations between PTM and self-reported parenting measures were small. We note that this should not discourage future applications of this novel approach. In fact, small program effects can be meaningful in preventive intervention settings (vs. clinical settings) to reduce public health burden. Future research is warranted for a better understanding about what individual or family processes may moderate the relationship between PTM and parenting outcomes.

Several limitations of this study should be noted. First, the sample was NG/R military parents and thus our findings may not be generalizable to other military family contexts. However, the designs of the study and the findings reported here may be informative for clinicians, prevention interventionists and researchers in their work with at-risk families in the parenting field. Second, mindful parenting was not assessed in the ADAPT program. Mindful parenting may be more malleable than trait mindfulness in a parenting intervention with small doses of mindfulness practices. Third, while we discussed our findings in relation to a prior study about parents’ engagement in mindfulness practices, parents’ actual practices were not systematically measured in this study. Thus, we were unable to explore a dose-response relationship. Finally, the APQ consisted of only a limited number of items and the reliability was low in the current sample, which might explain the weak correlation between APQ and observed parenting.

Future research should examine different dimensions of PTM in relation to parenting. Studies have shown that distinct mindfulness facets are variably linked to depression, anxiety, and stress (e.g., Desrosiers et al., 2013). In this study, we used FFMQ composite scores to measure PTM because the FFMQ is one of the most widely-used scales for measuring trait mindfulness and it captures the multidimensional aspect of trait mindfulness. We did not hypothesize that the ADAPT program would demonstrate different intervention outcomes based on distinct mindfulness facets. Neither did our study aim to test which one of the mindfulness facets is more or less important in the context of a parent training program. These important questions are beyond the scope of this article but they warrant further consideration. Finally, future research should consider using behavioral measures of mindfulness (Levinson et al., 2014), which may be a more reliable method than self-reports.

ETHICS STATEMENT

All procedures were approved by the University of Minnesota's Institutional Review Board. Before the study was conducted, written informed consent was obtained from all adult participants. Children provided assent while their parent provided written consent.

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AUTHOR CONTRIBUTIONS

NZ developed the research question, conducted the analysis, and wrote the first draft of the manuscript. JZ assisted in data analysis, writing the methods and results sections and created the tables and figures. AG (PI of the ADAPT study) contributed to the development of the manuscript, the writing of the discussion section, and edited the paper. All authors read and approved the manuscript and agreed with the authorship order.

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Effects of Mindfulness-Based Positive Behavior Support (MBPBS) Training Are Equally Beneficial for Mothers and Their Children With Autism Spectrum Disorder or With Intellectual Disabilities

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Parenting a child with autism spectrum disorder (ASD) or intellectual disabilities (IDs) can be stressful for many parents. Mindfulness-Based Positive Behavior Support (MBPBS) is a customized mindfulness program that enables parents and other caregivers to reduce their perceived psychological stress to normative levels through mindfulness procedures and to support children with ASD or ID to self-manage their challenging behaviors through positive behavior support (PBS). In this study, we evaluated whether MBPBS would have differential effects on the stress levels of mothers of adolescents with ASD ($n = 47$) or with ID ($n = 45$) and the effects of the program on the aggressive, disruptive, and compliance behaviors of their children. Both groups of mothers participated in the 40-week study (10 weeks control and 30 weeks MBPBS program), rated their own stress levels, and collected daily observational data on the adolescents' behavior. Results showed significant reductions in the level of stress in both groups of mothers, but no differential effects on mothers of children with ASD or with ID. In addition, significant reductions in aggression and disruptive behavior and increases in compliance behaviors were observed in the adolescents in both groups. The results suggest that MBPBS is equally beneficial for mothers of adolescents with ASD or ID. In the present study, although the mothers of children with ID had slightly higher levels of stress at baseline and mothers of children with ASD had lower levels of stress following the MBPBS program, the program can be considered equally effective in reducing the stress levels of both groups of mothers. This suggests that the program may be effective regardless of baseline levels of mothers' stress.

Keywords: Mindfulness-Based Positive Behavior Support, MBPBS program, autism spectrum disorder, perceived psychological stress, aggression, disruptive behavior, compliance

INTRODUCTION

Situational stress can help people to cope with and engage in adaptive responses to adverse situations (de Kloet et al., 2005; Joels and Baram, 2009), but prolonged stress usually has serious negative effects on brain function and behavior (Lupien et al., 2009; McEwen, 2012). Parents of children with autism spectrum disorder (ASD) and intellectual disabilities (IDs) are at risk for prolonged stress because of a number of child characteristics, such as age of the child, severity of diagnostic condition, level of functional abilities, and especially behavioral challenges (Davis and Carter, 2008; Osborne and Reed, 2010; Estes et al., 2013; Lovell and Wetherell, 2016). In addition to dealing with the child's chronic and periodically escalating behavioral challenges, parents may also have distal concerns regarding the child's long-term welfare that exacerbate their stress (Hsiao, 2018). Parental stress negatively affects not only child caregiving, such as harsh parenting (Mortensen and Barnett, 2015) and intervention outcomes (Shine and Perry, 2010), but also parental mental and physical health (Miodrag and Hodapp, 2010; Lai et al., 2015). Furthermore, parental stress differentially affects outcomes for parents and children with ASD when compared to those with ID alone (Estes et al., 2009; Griffith et al., 2010).

A number of parenting programs, including the so-called third-generation of cognitive-behavioral approaches, have focused on ameliorating the stresses and strains of parenting children and adolescents with intellectual and developmental disabilities (McIntyre and Neece, 2016). The third-generation or third-wave of cognitive-behavioral approaches have typically focused on assembling and testing the effects of multi-component therapeutic *procedures* that target multiple treatment goals based on a number of variables, including therapeutic priority, immediacy of treatment needs, difficulty of the treatment, and other outcome dimensions specific to an individual (Hoffman and Hayes, 2018). While this approach has produced evidence-based interventions that enhance quality of care, current research is shifting toward developing broad-based multi-level programs that focus on therapeutic *processes* derived from theory-based, testable, mechanisms of change as the basis for new interventions to achieve short- and long-term goals of the individual (Hayes and Hofmann, 2018). Of the currently available therapies, mindfulness programs seem to align well with a therapeutic process approach because they work at multiple levels to produce short-term therapeutic change, as well as longer term transformational change in the individual.

The third-generation therapies currently used with parents of children with ASD or ID include approaches based on Acceptance and Commitment Therapy (ACT) and mindfulness-based (MB) programs (Duncan et al., 2009; Cohen and Semple, 2010; Whittingham, 2014). For example, Blackledge and Hayes (2006) provided a 2-day training in ACT to parents of children with autism using a within-subject design, with assessments undertaken twice before the training and twice following the training. Results showed significant reductions in general distress and depression levels, and reduced experiential avoidance and cognitive fusion that were maintained for 3 months following the training. In a small qualitative study, Reid et al. (2016) provided

two 4-h workshops that included five key ACT concepts, "(i) stress is normal, (ii) how we use language and thoughts to problem solve, (iii) the downside to living in our thoughts, (iv) alternatives to living in our thoughts, and (v) being led by our values not by our thoughts." (p. 7). Parents reported being able to better cope with stress and with generally positive effects on their own well-being as well as that of their children. These studies indicate that using ACT procedures enhance psychological flexibility—a key outcome of ACT—which is indicative of parents being able to use mindfulness skills. Although only exploratory, these studies suggest that ACT procedures may have beneficial effects on parents of children with developmental disabilities. It remains to be seen if randomized controlled trials (RCTs) of ACT show significantly reduced stress in such parents and reduced behavioral challenges in their children.

Research using MB practices is farther along than for ACT. For example, Neece (2014) evaluated the effectiveness of the standard Mindfulness-Based Stress Reduction program (MBSR; Kabat-Zinn, 1990) in a waitlist control design study. When compared to waitlist control parents and their children, outcomes of the MBSR training included significant reductions in parental stress and depression, and reduction in behavior problems of their children. In a large RCT, Dykens et al. (2014) evaluated the comparative effects of MBSR and Positive Adult Development programs in a sample of 243 mothers of children with autism or other disabilities. Although significant effects were noted in both groups on measures of stress, anxiety, depression, sleep, and well-being, mothers in the MBSR group showed greater positive changes than the Positive Adult Development group on all variables except for stress. In a feasibility study, Lunsky et al. (2015) assessed the effects of a customized 6-week MB coping with stress group training with parents of adolescents and adults with developmental disabilities. Although the study was uncontrolled, initial results indicated the MB group training resulted in significant reduction in parental stress, but had no effect on their mindfulness or mindful parenting scores. Bazzano et al. (2015) adapted the standard MBSR program to address parent and professional caregiver stress. In a quasi-experimental design study, they tested the effects of this 8-week program in community settings, with training provided in both English and Spanish. Results indicated a significant reduction (by 33%) in the parents' and caregivers' perceived stress, and a 22% reduction in parental stress. In addition, based on self-report measures, both groups of participants reported significantly increased mindfulness and well-being. The positive effects were maintained at the 2-month follow-up assessment.

As with ACT programs, research on MBSR and adapted MBSR programs for parents of children (including adolescents and adults) with developmental disabilities show that parents can learn skills that reduce their stress levels, but they do not teach them how to better manage their children's challenging behavior—ostensibly the source of much of their stress. It is likely that escalating behavioral challenges evidenced by their children will test the parents' newly acquired stress management skills and they may likely revert to high levels of chronic stress. Positive Behavior Support (PBS) is an evidence-based approach that parents and professional caregivers use to support children,

adolescents, and adults who engage in challenging behaviors, such as anger, aggression, and disruptive behavior (MacDonald, 2016; Morris and Horner, 2016). Combining MB training with PBS braids two evidence-based practices—Mindfulness-Based Positive Behavior Support (MBPBS)—that can be taught to parents and other caregivers and seamlessly implemented in multiple contexts, such as family home, group homes, large residential centers, schools, and other community-based settings (Singh et al., 2016c). The mindfulness component of the MBPBS program was designed to include a broad array of meditations that go beyond the traditional secular MB programs. The reasoning behind this approach was that the program needs to be focused not only on enhancing the psychological and emotional well-being of the parents and their children, but also on putting them on a pathway to personal transformation and transcendence (Vago and Silbersweig, 2012).

The findings from initial implementation of MBPBS by caregivers of individuals with developmental disabilities indicated that the combined procedure was effective in significantly reducing caregiver stress and in managing the aggressive behavior of individuals with developmental disabilities in their care (Singh et al., 2015, 2016b). Furthermore, findings from these studies were confirmed in two subsequent RCTs (Singh et al., 2016a, 2018). Indeed, the early MB parent training studies that provided the basis for the development of MBPBS showed that the effects of parental mindfulness training cascades to the behavior of their children who did not receive mindfulness training (Hwang and Singh, 2016; Singh et al., 2017). For example, parental training in mindfulness decreased aggression, non-compliance and self-injury in children with autism (Singh et al., 2006), and decreased aggression and increased social behavior in children with developmental disabilities (Singh et al., 2007). In a proof-of-concept study, mothers of adolescents with ASD attended a MBPBS training program for 1 day a week for 8 weeks in a 48-week study. The training resulted in statistically significant reductions in the mothers' stress levels. In addition, the adolescents' challenging behaviors decreased and compliance with parental requests increased. In sum, there is growing evidence that training in MBPBS enables mothers and other caregivers to reduce their stress levels to within "normal" levels, and they are able to support individuals with ASD and ID to significantly reduce their challenging behaviors and increase socially acceptable behaviors.

The issue of providing effective training to parents of children with ASD is critical because of the growing prevalence of the disorder when compared to those with related disorders. For example the prevalence of ID has remained steady over the last decade at about 1.04% or 10.37 per 1,000 individuals (Maulik et al., 2011; McKenzie et al., 2016). The prevalence of autism was estimated at 0.5 per 1,000 in the 1960s, but it has increased dramatically in the last decade (Newschaffer et al., 2007). The average estimate of current prevalence of ASD is 16.8 per 1,000 or 1 in 68 (range = 13.1 to 29.3 per 1,000 children aged 8 years) as of 2014 in the United States (Baio et al., 2018). Given the challenges associated with the disorder, it is not surprising that mothers of children with ASD experience greater levels of stress than mothers of children with ID alone (Estes et al., 2009; Griffith

et al., 2010). Another consequence of having a child with ASD is the much higher risk for parental divorce when compared to parents with children that have other types of disabilities (Hartley et al., 2010). Furthermore, there is the added financial burden of caring for a child with ASD. Current estimates suggest that a child with ASD costs in the range of \$4,110–6,200 more annually when compared to children without autism, with an annual national cost of \$11.5–60.9 billion dollars (Center for Disease Control and Prevention [CDC], 2018).

Given these considerations, it is imperative that parents of children with ASD have access to programs that not only reduce their psychological stress, but also enhance their capability of positively caring for their children who exhibit challenging behaviors, such as aggression and disruptive behaviors. While several training programs with varying degrees of effectiveness are available (see McIntyre and Neece, 2016 for a review), there have been calls in the parenting literature that mothers of children with ASD may need additional interventions that incorporate "content specific to the challenges these parents and families face" (Cachia et al., 2016, p. 12) when compared to parents of children with ID. Conversely, research has not shown that the differences far outweigh similarities in parenting children with ASD or with ID alone to require interventions to be customized to each group of mothers. It could be that the differences may lie more in the degree than the nature of stressors affecting parents of children with ASD or with ID alone. Thus, the aim of this study was to evaluate whether training on MBPBS will have differential effects on mothers and their children with ASD or with ID alone in terms of the mothers' stress levels and the children's aggressive, disruptive, and compliance behaviors.

MATERIALS AND METHODS

Ethics Statement

All training procedures in the study were in accord with the 1964 Helsinki declaration and its later amendments or comparable ethical standards (e.g., obtaining assent from the children and consent from their parents; Carlson et al., 2004). Written informed consent was obtained from all individual participants involved in the study. This study was carried out in accordance with the recommendations of American Psychological Association (APA) Ethical Principles of Psychologists and Code of Conduct with written informed consent from all subjects.

Participants

The mothers of children with ASD or ID were recruited from the community, via flyers at medical centers, family physicians, and local service agencies, and by word-of-mouth over a period of 3 years and 5 months. Given the experimental design required equivalent diagnostic groups rather than random allocation of participants, recruitment continued until an equal number of eligible mothers were allocated to the two groups. A power analysis using the software G*Power 3.1 indicated that 86 participants were needed to detect a medium effect size ($f = 0.25$) of a within-between interaction (time \times group), between subject

factors (i.e., group), and within subject factors (i.e., time) of a repeated measures ANOVA with 80% power at the 0.05 significance level (Faul et al., 2009). The expected effect size was based on earlier studies using MBPBS (e.g., Singh et al., 2014, 2016a, 2018) and reviews of mindful parenting (e.g., Cachia et al., 2016). We oversampled because of expected dropouts prior to and during the study.

Mothers were included in the initial pool of possible participants if they had only one adolescent (aged between 13 and 19 years) with ASD or ID. A total of 145 mothers were assessed for eligibility and, of these, 35 were excluded because they did not meet eligibility criteria [e.g., did not meet inclusion criteria, declined to participate, other reasons (i.e., language barriers, training schedule conflicts, questionable diagnostic workup of their children, transportation issues)]. Of the 55 mothers allocated to the ASD group, eight dropped out for personal reasons prior to intervention and did not receive training in MBPBS. Of the 55 allocated to the ID group, 10 dropped out for personal reasons prior to training on MBPBS. **Figure 1** presents a CONSORT flow diagram of participant allocation. On average, the mothers had one to three typically developing children, but only one child with ASD or ID diagnosis. **Table 1** presents the characteristics of the mothers and their children with ASD or ID.

Procedure

Experimental Design

We used an equivalent diagnostic two-group design, with a control and intervention condition. In a 40-week study, the first 10 weeks constituted a control phase during which no additional procedures were instituted, followed by a 3-day training in MBPBS for both groups, and 30 weeks of implementation. The training was the same for both groups.

Experimental Conditions

Control

The first 10 weeks of the study served as a control phase enabling within and between diagnostic group comparisons. The mothers of children with ASD or ID were not provided with additional instructions on how to manage their children and were reminded to continue with their current practices without alteration in any way. In addition, the mothers were to continue with their usual self-care practices for their own physical and mental health.

Training

The 3-day MBPBS protocol was used in the intervention phase (see **Table 2** for details of daily sessions). This training protocol is based on the standard 7-day MBPBS course (see Singh et al., 2018), but reduced in terms of the required time commitment by the parents. The course was presented, in small groups in the community, in three parts during three consecutive days. The first day was devoted to training and practice in mindfulness procedures that included three basic meditations, four immeasurables, five hindrances, three poisons, beginner's mind, and ethical precepts. It also covered issues related to home practice, daily logs of meditation, journaling, and data collection. The second day was devoted to developing positive behavior

intervention and support (PBIS) plans. Training included the following components: guiding principles, goals for the mother and child, gathering PBIS plan-specific information, assessment instruments, designing PBIS plans, questions for designing PBIS plans, and data collection and reliability procedures. The third day was devoted to a review and practice of daily meditation practices for the mothers, day-to-day implementation of an integrated MB positive behavioral intervention with their child, living mindfully with their family on a daily basis, informal mindfulness practices, collection and interpretation of outcome data, and frequently asked questions.

MBPBS implementation

Following the 3-day training, the mothers implemented the MBPBS procedures in daily life, including their own meditation practices and developing and implementing PBS plans for their children, as needed. The MBPBS implementation procedure was similar to that used by Singh et al. (2014) in the initial multiple-baseline proof-concept study with mothers of children with ASD. The mothers had regular contact with the research team on a weekly basis for clarification of any procedures, questions arising from their daily practice, and reporting on their daily meditation practice.

MBPBS trainer

The MBPBS trainer had a life-long practice of Buddhist meditation practices and over 30 years of practice as a meditation instructor. In addition, the trainer had extensive experience as a behavior analyst, certified at the BCBA-D level, and over 40 years of experience in developing and implementing behavior intervention plans.

Fidelity of MBPBS Training

The training was videotaped for 10–12 min per hour per day during random segments of each hour of training. Twenty-four videotaped segments were rated for fidelity of MBPBS training by two independent raters, one an expert in mindfulness and the other an expert in PBS. The fidelity of MBPBS training was rated at 100% for meditation instructions and for principles, components of PBIS plans, and applications of PBS.

Measures

Training attendance

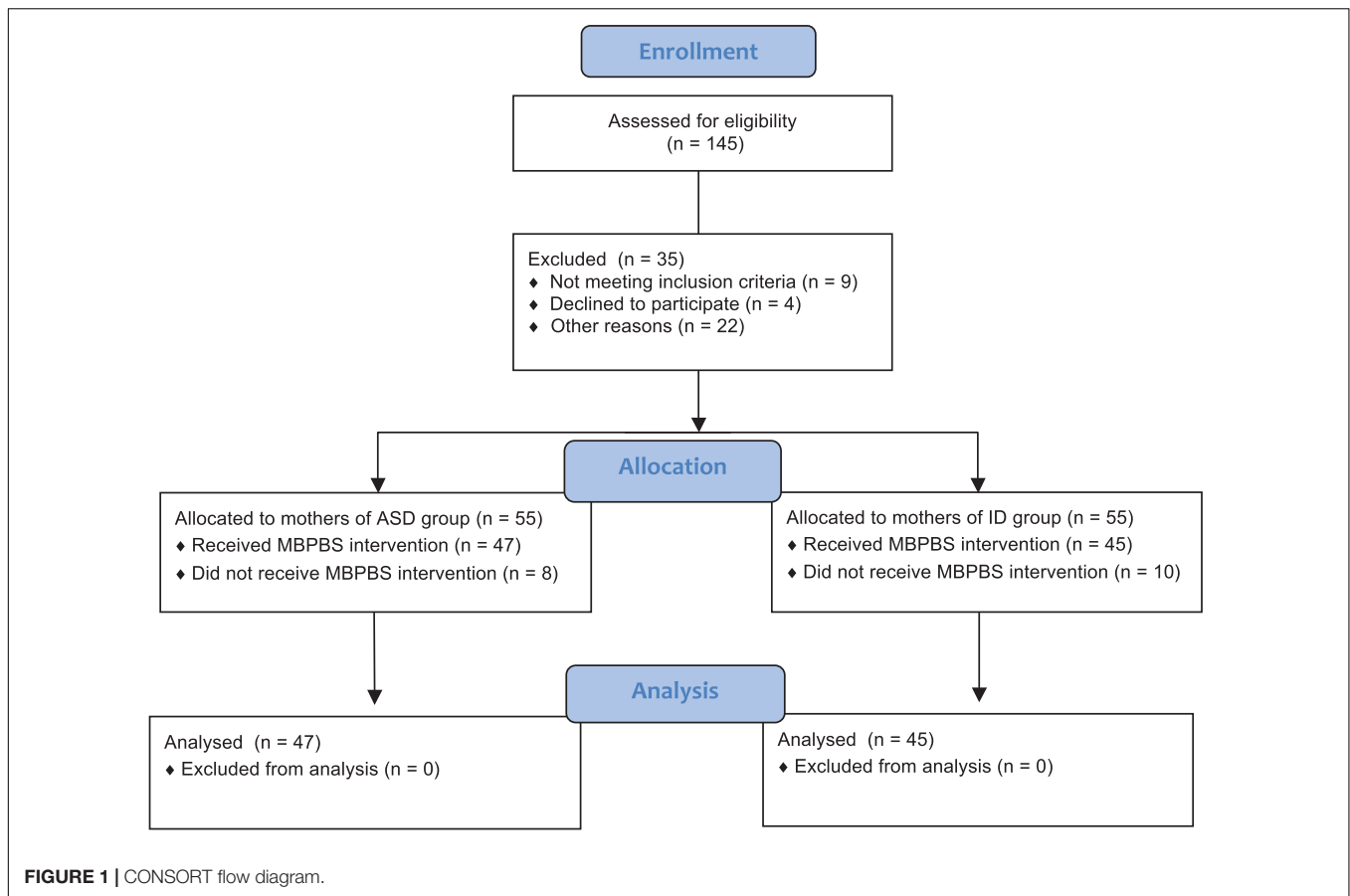
We recorded the mothers' attendance at the 3-day MBPBS training.

Meditation practice

The mothers recorded in their daily logs the total time they spent in meditation practice each day during the 40-week study.

Perceived Stress Scale

The 10-item Perceived Stress Scale (PSS-10; Cohen et al., 1983) is a self-report questionnaire that was used to provide a subjective evaluation of lack of control (e.g., *In the last month, how often have you felt that you were unable to control important things in your life?*), unpredictability (e.g., *In the last month, how often have you been upset because of something that happened unexpectedly?*), and overload in the mothers' daily life (Cohen and Williamson, 1988). The mothers responded on a five-point



Likert scale format that ranged from 0 (never) to 4 (very often). The total score is calculated by reverse coding four items (i.e., 4, 5, 7, and 8) and then adding the scores of all 10 items, with higher scores indicating greater levels of perceived stress. The scale has adequate psychometric properties, with Cronbach's alpha of 0.78 (Cohen and Williamson, 1988) and 0.80 for the present study. The mothers completed PSS-10 three times: on the first day of the control phase (Week 1); last

day of control phase (Week 10); and the last day of MBPBS implementation (Week 40).

Aggressive behavior

Aggressive behavior was defined as the adolescent biting, hitting, scratching, punching, kicking, and slapping directed at any nuclear family member, or destroying property. This definition includes the universe of specific acts defined as aggression, but

TABLE 1 | Socio-demographic characteristics of the mothers and their adolescents with either autism spectrum disorder (ASD) or intellectual disabilities (IDs).

	ASD		ID	
	Mothers	Adolescents	Mothers	Adolescents
Number of participants	47	47	45	45
Mean age/years	47.91	15.15	48.82	15.56
Age range (years)	39–59	13–17	38–55	13–17
Sex: females	47 (100%)	16 (34%)	45 (100%)	15 (33%)
Level of functioning				
ASD Level 1	na	47 (100%)	na	na
Mild	na	na	na	45(100%)
Number of individuals on psychotropic medications	na	22 (46.81%)	na	21 (46.67%)
Number of individuals with mental illness	na	12 (25.53%)	na	21 (46.67%)
Number of individuals with behavior plans for aggressive behavior	na	24 (51.01%)	na	26 (57.78%)

Note: na = not applicable.

TABLE 2 | Outline of the 3-day MBPBS Program.

Day 1 (Mindfulness training)	<p>Samatha, Kinhin, and Open Monitoring meditations</p> <p>Five hindrances—sensory desire, ill will, sloth and torpor, restlessness and remorse, and doubt</p> <p>Four Immeasurables (<i>Brahmavihara</i>: <i>metta</i>—lovingkindness; <i>karuna</i>—compassion; <i>mudita</i>—empathetic joy; <i>upekkha</i>—equanimity)</p> <p>The three poisons—attachment, anger, and ignorance</p> <p>Beginner's mind</p> <p>Practicing ethical precepts—refrain from (a) harming living creatures, (b) taking that which is not given, and (c) incorrect or false speech</p> <p>Daily logs and journaling</p>
Day 2 (PBS training)	<p>Review of the meditation instructions and practices (daily logs)</p> <p>Practice Samatha, Kinhin, and Open Monitoring meditations</p> <p>Review of the five hindrances, four immeasurables, three poisons, beginner's mind, and ethical precepts</p> <p>Developing positive behavior intervention and support (PBIS) plans</p> <p>Guiding principles</p> <p>Goals for mother and child</p> <p>Gathering PBIS plan-specific information</p> <p>Functional assessment tools</p> <p>Developing specific hypotheses</p> <p>Designing PBIS plans</p> <p>Function-based modifications</p> <p>Teaching alternative skills</p> <p>Changing the consequences</p> <p>Providing long-term supports to enhance quality of life</p> <p>Questions for designing PBIS plans</p> <p>Implementing the PBIS plans and data collection procedures</p>
Day 3 (Mindfulness and PBS training and practice)	<p>Review of the meditation instructions and practices (daily logs)</p> <p>Practice Samatha, Kinhin, and Open Monitoring meditations</p> <p>Review of the five hindrances, four immeasurables, three poisons, Beginner's mind, and ethical precepts</p> <p>Review and practice developing PBIS plans</p> <p>Putting it all together as a seamless package of practices</p> <p>Implementing MBPBS practice</p>

individual adolescents could engage in a single behavioral act or different combinations of these behaviors. Aggressive behavior data were aggregated in terms of number per week for the 40 weeks of the study.

Disruptive behavior

Disruptive behavior was defined as acts of the adolescent that “negatively affected the family’s social interactions, including pushing, shoving, inordinate or inappropriate demands for time or attention, creating excessive noise, offensive verbal comments, performing distracting repetitive acts during social interactions, and other idiosyncratic behaviors identified by the mothers of the adolescents in this study” (Singh et al., 2014, p. 648). Disruptive behavior data were aggregated in terms of number per week for the 40 weeks of the study.

Compliance with mother’s requests

Compliance was defined as the adolescent “responding to his mother’s requests in a socially appropriate manner within an acceptable timeframe that was determined by each mother” (Singh et al., 2014, p. 643). Compliance data were aggregated in terms of mean percentage per week.

The mothers collected data on their adolescent’s behavior using an App that allowed recording of multiple events in real

time. They collected data when the adolescent was at home and in their mother’s presence (i.e., excluding times when the adolescent was in the bedroom or during personal and private time). On average, the mothers collected data on adolescent behavior for about 5 h during weekdays and about 8 h during weekends.

To establish inter-rater agreement, fathers also collected data on their adolescents’ behaviors using the same system but independently of the mothers, for an average of 2 h each week, usually during evenings and weekends. Inter-rater agreement was defined as both parents recording an instance of a specific behavior at about the same time (i.e., within ± 5 s). We calculated percent inter-rater agreement for each week by dividing the total number of agreements by the total number of observations made during that period and multiplying by 100. The inter-rater agreement for all observations with both parents present ranged from 83 to 100%, with a mean of approximately 90%.

Data Analyses

For observed aggressive behavior, observed disruptive behavior, overall compliance, and maternal meditation, the unit of analysis was a count variable (either number of instances or number of minutes) for all individuals within a specified group. We adopted a strategy employed previously (Singh et al., 2016a) in which

these group-level data were analyzed in an n of 1 framework, with each group being considered a single unit. To accomplish this, we plotted each count variable for each group across all weeks of the study. To supplement the visual presentation, we computed a Phi coefficient with a corresponding p -value (Parker et al., 2007; Parker and Vannest, 2009). This coefficient represents the extent to which data from a control and an intervention phase overlap. If there is no change in behavior across phases, then data points will overlap completely ($\Phi = 0.00$); if there is substantial change in behavior, then data points will not overlap at all ($\Phi = 1.00$). The associated p -value represents the probability that the obtained results are due to chance. We also averaged counts per week across the 10-week control phase and the 30-week implementation phase for each group. As the unit of analysis was not individuals, we were not able to utilize a mixed-model ANOVA.

Data regarding perceived stress were reported at the individual level, and thus a mixed-model ANOVA was used to compare main effects of group, time, and their interaction. Effect sizes reported include η^2 for an overall effect size (with 0.02, 0.15, and 0.35 being small, medium, and large, respectively), or for a specific condition across time.

RESULTS

Demographic Variables

A series of chi-square and independent samples t -tests revealed that there were no significant differences between diagnostic groups with regard to age of participants (mothers or adolescents), biological sex, use of psychotropic medications, or presence of behavior plans (all $p > 0.05$; see Table 1).

Mother Variables

Training Attendance

All mothers in the ASD and ID groups attended all 3 days of MBPBS training.

Meditation Practice

None of the mothers in either the ASD group or the ID group engaged in meditation during the control phase. On average, the mothers in the ASD and ID groups meditated for 18.77 and 18.23 min daily during the 30 weeks following the training, respectively.

Perceived Stress

A 2 (group: ASD versus ID) \times 3 (time: control week 1, control week 10, MBPBS implementation week 40) mixed-model ANOVA was used to examine maternal reports of perceived stress across groups and across the three phases of assessment (control week 1, control week 10, and MBPBS intervention week 40). The between subjects factor was statistically significant, $F(1,90) = 4.98, p = 0.028 (\eta^2 = 0.052)$. This revealed an overall group effect, with mothers in the ID group reporting significantly higher stress ($M = 30.72, SD = 1.79$) than mothers in the ASD group ($M = 29.74, SD = 2.37$). There was also a significant effect of assessment time, $F(2,89) = 637.82, p < 0.001 (\eta^2 = 0.935)$, with no

significant interaction effect $F(2,89) = 2.21, p = 0.12 (\eta^2 = 0.047)$. See Figure 2 for a visual depiction of these trends.

Adolescent Variables

Autism Spectrum Disorder

Weekly counts of aggressive and disruptive behavior decreased substantially from the control phase to the intervention phase (aggressive behavior: $\phi = 0.71, p < 0.001$; disruptive behavior: $\phi = 0.86, p < 0.001$). Expressed as means and standard deviations across phases, aggressive behavior decreased from control ($M = 14.00, SD = 2.31$) to intervention ($M = 3.33, SD = 3.92$). Disruptive behavior also decreased from control ($M = 38.80, SD = 7.47$) to intervention ($M = 9.20, SD = 8.25$). Percent compliance increased substantially across these phases ($\phi = 0.86, p < 0.001$), reflecting a change from control ($M = 20.10, SD = 2.85$) to intervention ($M = 55.83, SD = 22.50$). See Figure 3 for a visual depiction of these trends.

Intellectual Disabilities

Among adolescents with ID weekly counts of aggressive and disruptive behavior decreased from the control phase to the intervention phase (aggressive behavior: $\phi = 0.66, p < 0.001$; disruptive behavior: $\phi = 0.87, p < 0.001$). In terms of means and standard deviations across phases, aggressive behavior decreased from control ($M = 12.50, SD = 2.80$) to intervention ($M = 4.20, SD = 4.12$). Disruptive behavior also decreased from control ($M = 33.90, SD = 6.56$) to intervention ($M = 10.03, SD = 7.87$). Percent compliance increased substantially across these phases ($\phi = 0.87, p < 0.001$), reflecting a change from control ($M = 28.30, SD = 3.06$) to intervention ($M = 61.93, SD = 20.00$). See Figure 4 for a visual depiction of these trends.

DISCUSSION

Many mothers and other caregivers report elevated levels of chronic stress while raising or caring for children with ASD and ID. A small number of training programs based on the so-called

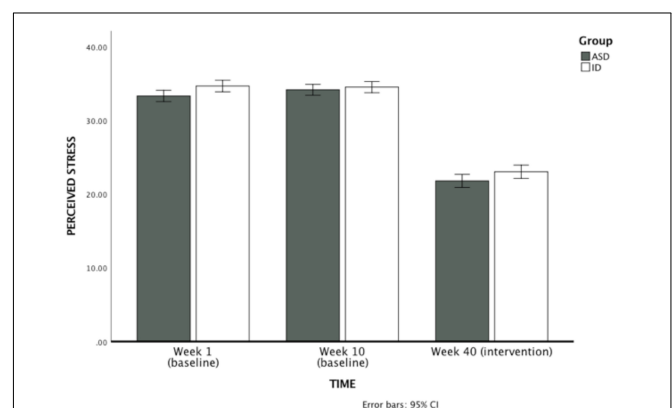
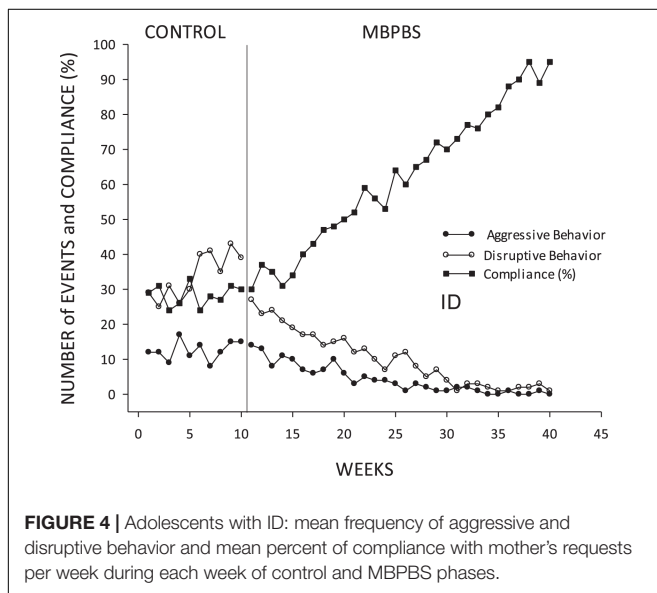
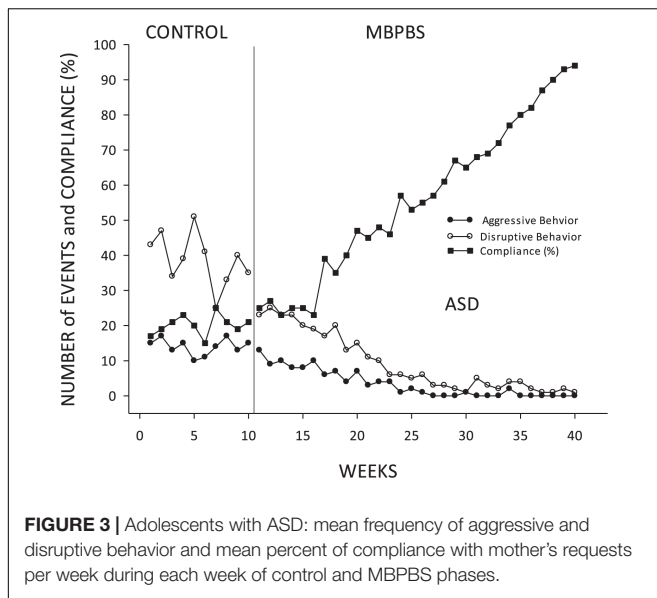


FIGURE 2 | Mothers' ratings of perceived psychological stress on PSS-10 during the first week of the control condition, the last week of the control condition (week 10), and the last week of MBPBS intervention (week 40). Higher scores indicate greater psychological stress.



third-generation of cognitive-behavioral approaches have been developed and evaluated, usually in non-RCT trials (Duncan et al., 2009; Cohen and Semple, 2010; Whittingham, 2014; Donnchadha, 2018). MBPBS is prototypic of these approaches and has been evaluated for its effectiveness and efficacy across a number of studies using single-subject, quasi-experimental, and RCT trials (Hwang and Singh, 2016; Singh et al., 2016c, 2017). In an effort to extend the findings of these studies, the present study investigated whether training in the 3-day MBPBS program would have differential effects on mothers and their children with ASD or ID.

As reflected in the eta-squared values, the total sample change across time accounted for far more variance (93.5%) than did the minor group effects (5.2% of variance explained). This indicates that the very small group differences were maintained throughout

all phases of the study. In other words, the lack of an interaction effect indicates that both groups of mothers responded equally well to MBPBS, and response to the intervention accounted for far more variance in perceived stress than did group membership. In short, MBPBS did not have a differential effect on mothers of children with ASD or with ID. This finding can be interpreted in different ways. First, even though mothers of children with ASD have significantly more stress than mothers of children with ID, the similarities between the two groups of mothers outweigh their differences and thus do not require differential interventions based on the diagnosis of their children. Second, regardless of the differential stress levels of the two groups of mothers, the impact of the MBPBS program is strong enough to overcome the differences. We suspect, and this is a matter for future research, that the different stress levels is not inherent in the two groups of mothers but a result of cumulative effects of different presentations of challenging behaviors of children with ASD and with ID in terms of type and topography (e.g., stereotypy, rituals, aggression, destructive behaviors), severity, duration, intensity, and frequency. If this is the case, then the intervention would favor programs that teach the mothers how to reduce their stress levels and more skillfully support their children. MBPBS may be effective for both groups of mothers because it focuses on these two components. Of course, other approaches may have differential effects, but it does warrant examining whether different interventions are necessary for reducing stress in these two groups of mothers simply on the basis of their children's diagnostic grouping.

Braiding mindfulness meditation practices with the practical behavior management strategies derived from PBS appear to enhance the mothers' ability to not only effectively manage the behavior of their children, but also better manage their own psychological stress. It is likely that the breadth of mindfulness practices included in MBPBS enables mothers to re-perceive (Shapiro et al., 2006) their interactions with their children. That is, they learn to shift their attention away from the negative emotional arousal that results from their children's challenging behaviors to their moment-by-moment interactions with objectivity and awareness, and to refrain from automatic reactivity. Re-perceiving may enable the mothers to lower the psychological distress that may arise from the challenging behaviors of their children (Harnett et al., 2016; Uusberg et al., 2016). This suggests that enhanced mindfulness may buffer the stressful consequences of negative mother-child interactions as postulated in the stress-buffering model of Cohen and Edwards (1989) and the disability-stress-coping model (Wallander et al., 1989). Future research may investigate whether the enhanced mindfulness mothers may derive from training in MBPBS attenuates the association between their children's challenging behaviors and their own psychological stress.

Given the breadth of meditation practices encompassed in the MBPBS program, other mechanisms of change most likely came into play, including those that have been posited for mindfulness itself (Vago and Silbersweig, 2012; Bernstein et al., 2015; Carona et al., 2016). For example, compassion—defined as “sensitivity to suffering in self and others, with a deep commitment to try to relieve it” (Gilbert, 2010, p. 3)—is included in the MBPBS

program. In Buddhist teachings, mindfulness and compassion are inextricably linked to awakening (Brach, 2004), but in programs such as MBPBS, mindfulness may aid mothers to see the reality of their situation as it is without bias, and compassion may provide them with the antidote and skillful means of overcoming their stress and related suffering (Wallace and Shapiro, 2006). The current paper was not designed to investigate the mechanisms by which the MBPBS may produce the documented changes, but we recognize that individual components may have overlapping and synergistic mechanisms that need to be investigated in future research.

Mindfulness-Based Positive Behavior Support appears to be a fairly robust intervention in terms of its effects on parents, professional caregivers, and teachers, and the individuals with ASD and ID in their care (Singh et al., 2017). Its effects have been tested using different components and varying number of days of training. Recent controlled trials have used the final iteration of components and taught in a 7-day format (e.g., Singh et al., 2016a, 2018). However, given the diversity in the parent population, it is more than likely that dosage of training will be a factor in outcomes for parents in any intervention, including MBPBS. Several MB interventions have been developed as multi-component packages, with the presumption that one-size-fits-all for producing beneficial effects across outcome variables. But, participants of MB programs come from different cultures, are of different ages, have differing needs, evidence a variety of spiritual, psychological, and mental health needs, and bring with them different causes and conditions that may directly or indirectly affect intervention outcomes. MBPBS was developed with these issues in mind. Thus, following the stepped-care model of intervention (Davison, 2000), the training dosage in the present study was reduced to 3 days, with the option of providing further training if deemed necessary. When compared to longer training versions, the stepped-care MBPBS model is least restrictive in terms of participant costs and personal inconvenience, which are important considerations for those already burdened with chronic stress. Of course, there still remains the issue of predicting the level of training needed by specific participants before a particular training is instituted, and the question of whether there is a need for an algorithm that may assist therapists and trainers to determine who may need further training or when training needs to be stepped up. These issues at the intersection of stepped care and personalized medicine are for future research.

In a study using MBPBS with mothers of children with ASD, Singh et al. (2014) noted a difference between the earlier and more recent MB interventions. They termed the earlier programs as “the first generation of MB approaches that were developed as secular interventions for ameliorating psychological and physical distress” (Singh et al., 2014, p. 655) and the emerging programs as “second generation of MB approaches” (p. 655). This dichotomy in MB programs has since been developed further (Van Gordon et al., 2015) and research on several second-generation programs has been published (see the Special Section on this topic in the journal *Mindfulness*, 2019). The first generation of MB programs was secular and designed to enhance psychological and emotional

well-being and the second-generation programs are based on Buddhist teachings and precepts that not only enhance well-being but also encourage personal transformation and transcendence. MBPBS is a second-generation program because it includes not only some of the traditional components of MB programs, but also Buddhist concepts such as the three poisons, four immeasurables, five hindrances, and ethical precepts (Singh et al., 2013, 2014, 2018). These additional teachings may help participants to better experience the transformative effects of mindfulness as they develop wisdom, ethical conduct, and meditation practices (Bodhi, 2011).

One of these Buddhist concepts concerns the three poisons. This concept can be practically applied to enable a better understanding of the difference between skillful and unskillful intentions and reactions. This reflects a fundamental distinction in Buddhist thought between what is skillful or wholesome (*kusala*) and what is its opposite. This fundamental distinction informs Buddhist ethics and provides the underlying rationale for much of its meditational practices.

Applying this distinction may help mothers to be more mindful in their interactions with their children with ASD or ID. Skillful intentions toward their children arise from a mind that is free from the three poisons, which are greed, aversion, and delusion. Unskillful intentions arising from greed, aversion, and delusion may lead to *dukkha* (i.e., suffering, disease, or stress) for both themselves as well as their children. Understanding the causes and conditions of their intentions and actions may enable mothers to be more psychologically flexible with their children, thus reducing their own stress (Ruskin et al., 2013).

Mothers receive grounding in attitudinal or emotional modes of attending to their mental state through teachings on the four immeasurables (*brahmavihara*), which include: lovingkindness (*metta*), compassion (*karuna*), empathetic joy (*mudita*), and equanimity (*upekkha*). The fundamental quality of the four immeasurables is unconditional, as in unconditional lovingkindness, which makes them immeasurable. Through specific meditations, the mothers develop a wish, an aspiration, a resolve, and inspiration to transform their attitude toward all sentient beings. The ensuing attitudinal change process enables the mothers to gain insight into their own mental states, or the quality of their mind at any given time, as well as the purported workings of the minds of their children with ASD or IDD. For example, mothers gain an understanding that their children may not have developed skillful ways of dealing with their *dukkha*, and are thus responding with anger, aggression, and destructive behaviors. This understanding may lead the mothers to respond to their children with feelings of lovingkindness and compassion instead of reacting with harsh discipline. They may invoke an aspiration and resolve to act skillfully to reduce the children’s suffering and the causes of suffering. Cultivation of the four immeasurables changes mother–child interactions, resulting in reductions in both the challenging behaviors in the children and the psychological stress in the mothers (see Hoffman et al., 2013 for a review of the effects of lovingkindness and compassion meditation of psychological functions). While confirmatory research evidence is needed, we suspect that when the four immeasurables are coupled with other meditations

included in MBPBS, synergistic transformations occur in the mothers and the children.

Similarly, a recognition of the presence of any of five mental conditions that are reckoned to be hindrances, which are sensual desire (*kamacchanda*), aversion (*thinamiddha*), sloth and torpor (*thinamiddha*), restlessness and worry (*uddhaccakukkucca*), and doubt (*vicikiccha*), may help mothers to respond more mindfully to their children. Employing this conceptual framework may help the mothers to detect when one of these detrimental conditions is present in their own mind, which by their nature lead to lack of clarity and unbalanced reactions. Based on such recognition, they can gradually learn to become aware of the conditions that result in the arising of a hindrance, how to overcome the arisen hindrance, and how to prevent the hindrance from arising again in future (Anālayo, 2003). In this way, based on applying traditional Buddhist instructions on the systematic cultivation of mindfulness in relation to the hindrances to their actual situation, mothers can use the concept of the five hindrances to check on the mental state of their minds. Such checking is not confined to formal meditation practice but also applicable to daily life. Based on increased awareness of their own mental condition with the help of this conceptual framework, they can learn to adjust their actions accordingly.

Another relevant Buddhist concept concerns the experience of feelings (*vedana*). Whereas the hindrances are the topic of what in the Buddhist traditions is considered the fourth establishment of mindfulness (*satipatthana*), feeling tone is the second establishment of mindfulness. Here the main task is to learn to recognize if experience in the present moment comes with a positive, negative, or neutral affective tone. Learning such recognition helps to realize the degree to which action and reaction take place under the usually not noticed influence of such feelings. When negative feelings arise during mother-child interactions, the mother is aware of the fact that such feelings are transient and clinging to them is stressful. Thus, she can learn to non-judgmentally observe and let go of the feelings as they arise, thus preempting the stress associated with clinging to them.

Mindfulness-Based Positive Behavior Support includes instruction in three ethical precepts as it may apply to mother-child interactions, i.e., to refrain from (a) harming living creatures, (b) taking that which is not given, and (c) false speech. These precepts are presented in a positive manner in terms of what mothers can do as opposed to what they should refrain from. For example, the ethical imperative of refraining from harming living creatures is taught within the context of using alternative positive practices instead of restrictive physical restraints that some parents resort to when stressed and emotionally exhausted (Allen et al., 2006; Lecavalier et al., 2006). Similarly, false speech is taught within the context of harsh verbal discipline that may prove to be emotionally crippling to the child. In more general terms, MBPBS emphasizes the difference between the mechanistic functions of paying attention in the present moment and genuine mindfulness (*samma sati*) that always incorporates an element of moral sensitivity, an ethical dimension that differentiates actions that may be harmful or beneficial.

As is common in MB interventions, the present study used mothers' self-report of perceived psychological stress as the marker of internal change. Often this assessment is paired with other outcomes from self-report rating scales, such as changes in the level of mindfulness and other internal states before and after a MB intervention. Undoubtedly, these measures provide a reasonably good indication of the effects of intervention but this method of ascertaining outcomes suffers from common method bias (Podsakoff et al., 2003). Biological markers have emerged as a more reliable and objective method of measuring subjective states and could be used to provide confirmatory evidence. For example, Ruiz-Robledillo et al. (2015) used cortisol awakening response and afternoon cortisol levels as biomarkers of subjective change in a pilot study of the effects of MB intervention on mood disturbance and health complaints of parents of children with ASD. Future research could measure changes in biomarkers that have been linked to acute and chronic stress, such as stress hormones [i.e., cortisol and adrenocorticotropic hormone (ACTH)] and markers of inflammation [i.e., tumor necrosis factor-alpha (TNF-alpha), and IL-6] in the bloodstream, that are being used in other areas of mindfulness research (e.g., Hoge et al., 2018). Including biomarkers could enable researchers to determine if the participants are experiencing a homeostatic or a more stressful state.

To preempt common method bias in the children's data, we used mothers' behavioral observations in real time instead of the more commonly used parent ratings (e.g., Aberrant Behavior Checklist, 2017; Aman and Singh, 2017). In addition, we included fathers as observers of their children's behavior during the weekends at the same time as but independently of the mothers. This enabled the assessment of inter-rater agreement between the parents, showing that the reliability of the primary observer (the mother) exceeded the standard criterion of 80% inter-rater agreement (Ledford and Gast, 2018).

Given the growing evidence-base for the effectiveness of MB interventions for stress across different populations, perhaps it is time for our field to consider how to translate research to practice. For example, if other researchers can replicate the current findings on the effectiveness of MBPBS, it may be an indication that translational research on this intervention is warranted. If our evidence-based interventions cannot be translated into reducing *dukkha* of those who need it, then the best evidence supporting their use is of little practical consequence in the lives of people. How to make such interventions available to parents and other caregivers who need it, but do not have access to it, may be the next step in future research.

AUTHOR CONTRIBUTIONS

NS designed and executed the study, assisted with data analyses, and wrote the first draft. GL collaborated on the design and writing of the study. BK analyzed the data and drafted the section "Results." RM and Y-SH assisted with the writing, editing, and revision of the manuscript. BA assisted with the finer points of Buddhist teachings from an Early Buddhist perspective.

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Be a Mom, a Web-Based Intervention to Prevent Postpartum Depression: The Enhancement of Self-Regulatory Skills and Its Association With Postpartum Depressive Symptoms

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Aim: Be a Mom is a self-guided, web-based intervention to prevent persistent postpartum depression symptoms [PPD], targeting both at-risk postpartum women and/or women presenting early-onset postpartum depressive symptoms (selective/indicated preventive intervention). Be a Mom is grounded on the principles of Cognitive-Behavior Therapy and incorporates the recent contributions of acceptance and compassion-based approaches (third-wave approaches) applied to the perinatal context. This study aimed to explore the processes underlying therapeutic change in the Be a Mom intervention, by: (1) exploring whether participation in the Be a Mom promotes the enhancement of self-regulatory skills (emotion regulation abilities, psychological flexibility and self-compassion) in comparison with women who did not participate in the program; and (2) exploring whether changes in self-regulatory skills are associated with changes in depressive symptoms, among women who participated in the Be a Mom program.

Methods: A pilot randomized, two-arm controlled trial was conducted. Eligible women (presenting PPD risk-factors and/or early-onset PPD symptoms) were enrolled in the study and were randomly assigned to the intervention group (Be a Mom, $n = 98$) or to the waiting-list control group ($n = 96$). Participants in both groups completed baseline (T1) and post-intervention assessments (T2), including measures of depressive symptoms, emotion regulation abilities, psychological flexibility and self-compassion.

Results: From baseline to post-intervention assessment, women in the intervention group showed a significantly greater decrease in the levels of emotion regulation difficulties ($p < 0.001$) and a significant greater increase in the levels of self-compassion ($p < 0.001$) compared to the control group. No significant differences were found concerning psychological flexibility. Moreover, a greater decrease in difficulties in emotion regulation and greater increase in self-compassion levels were significantly associated with a greater decrease in depressive symptoms, among women in the intervention group.

Discussion: Be a Mom promotes the enhancement of women's emotion regulation abilities and self-compassion, and this seems to exert a protective effect in the presence of PPD risk factors (or early-onset symptoms) because it led to a reduction of depressive symptoms. By providing some insights into the processes that underlie treatment response to Be a Mom, this study highlights the important role of the targeted third-wave processes applied to the perinatal context.

Keywords: Be a Mom, emotion regulation abilities, pilot randomized trial, postpartum depression, prevention, psychological flexibility, self-compassion, web-based interventions

INTRODUCTION

Postpartum depression (PPD) represents a significant public health problem. PPD is the most prevalent condition after childbirth and affects 13–20% of new mothers (Pearlstein et al., 2009; Gelaye et al., 2016), with estimates being higher in low- and middle-income countries (Fisher et al., 2012). Existing research has clearly identified a set of factors that put women at increased risk for developing PPD, including prior history of anxiety/depression, prenatal anxiety and depression, occurrence of stress-inducing events (e.g., death, divorce or job loss), lack of social support and poor quality of marital relationship (e.g., Beck, 2002; Robertson et al., 2004; Enatescu et al., 2017); this well-defined set of risk factors resulted in the development of risk inventories (e.g., Beck et al., 2006) that allow the timely identification of women at increased risk of PPD. Women who meet criteria for PPD often display comorbid anxiety symptoms (Falah-Hassani et al., 2016) and are at an increased risk for prolonged depression (Netsi et al., 2018). If untreated, the effects of PPD may be far-reaching and long-lasting, not only to the mother's health (Woolhouse et al., 2014), but also to the mother-child interaction (Tronick and Reck, 2009) and to the child's development (Kingston et al., 2012; Stein et al., 2014). Given the significant number of maternal-infant dyads affected by PPD (Drury et al., 2016), there have been increased efforts to implement effective prevention and treatment approaches to target this clinical condition.

Existing preventive interventions for PPD have been found to be effective (Sockol, 2015), although the effects were modest when compared to PPD treatments. Most existing face-to-face preventive interventions focus on minimizing PPD risk factors (e.g., lack of social support) without grounding in psychological therapy models, despite evidence of their increased effectiveness (Clatworthy, 2012; Werner et al., 2015). Therefore, there is a need to develop preventive interventions for PPD grounded in well-established psychotherapeutic models with proven effectiveness in preventing and treating PPD, such as Cognitive-Behavior Therapy (CBT) (Sockol, 2015). Moreover, due to stigma and practical barriers, such as access constraints to healthcare services, women's compliance with face-to-face preventive and treatment interventions for PPD is low (McGarry et al., 2009; Fonseca et al., 2015). Web-based interventions seem to be a feasible option for PPD prevention and treatment due to their characteristics (e.g., flexibility of access, privacy), and there is preliminary evidence of its efficacy (Lee et al., 2016), although further research is needed.

Preventing PPD: Which Core Psychological Processes Should Be Targeted?

Despite the extensive body of research on contextual (e.g., socioeconomic status, marital status, lack of social support) and clinical (e.g., prior history of depression) risk factors for PPD (Robertson et al., 2004; O'Hara and McCabe, 2013), there are some recent studies (e.g., Haga et al., 2012; Felder et al., 2016; Fonseca et al., 2018b) linking the absence of self-regulatory skills, such as emotion regulation abilities, psychological flexibility, and self-compassion, to the development and maintenance of PPD. Emotion regulation abilities may be defined as the individual's ability to be aware of and to understand their emotional states and to use flexible and situationally appropriate strategies to address emotions and engage in goal-directed behaviors (Gratz and Roemer, 2004). Individual differences in the regulation of emotions have been linked to a heightened risk for the onset of major depressive episodes (Joorman and Siemer, 2014), particularly individual differences in the ability to repair and regulate negative emotions, which may result in longer episodes of sadness and depressed mood (Nolen-Hoeksema et al., 2008). Specifically, the use of maladaptive emotion regulation strategies (e.g., rumination and suppression) has consistently been linked with the onset and maintenance of depressive symptoms (Nolen-Hoeksema et al., 2008; Joormann and Gotlib, 2010; Joorman and Vanderlin, 2014). In a longitudinal study that aimed to identify the predictors of PPD, Haga et al. (2012) found that the habitual use of maladaptive cognitive emotion regulation strategies (e.g., self-blame and rumination) was associated with postpartum depressive symptoms over time. Similar associations between maladaptive strategies of emotion regulation (e.g., suppression of emotional states) and maternal psychopathological symptoms were found in another recent study (Edwards et al., 2017). Moreover, women who presented clinically relevant postpartum depressive symptoms were found to present more emotion regulation difficulties than non-depressed women (Marques et al., 2018).

Psychological flexibility may be understood as the individual's ability to accept aversive emotional experiences in the moment while maintaining engagement in value-based behaviors and choices (Hayes et al., 2006). Specifically, lower psychological flexibility has been found to be associated with higher depressive symptoms in the postpartum period (Zhu et al., 2015; Fonseca et al., 2018b). Evans et al. (2012) found that higher psychological flexibility is associated with higher

maternal attachment, higher maternal responsiveness and lower postpartum depressive symptoms.

Finally, the role of self-compassion, understood as the individual's ability to have a kind and caring attitude toward oneself in the face of personal inadequacies or suffering while acknowledging that all individuals share a common human condition (Neff, 2009, 2012), has also been highlighted. Lower levels of self-compassion were found to be associated with higher levels of postpartum depressive symptoms (Felder et al., 2016; Fonseca and Canavarro, 2018), and Cohen (2010) found that greater self-compassion during pregnancy can exert a protective effect on the development of postpartum depressive symptoms.

It seems that during the postpartum period, women need to establish a new identity as mothers while striving to regain a sense of normalcy within the context of rapid changes in their roles, responsibilities and self-image (Kanotra et al., 2007). This can challenge their emotional adjustment and translate into more negative thoughts and emotions. Women who present more difficulties in regulating their emotional states, lower psychological flexibility and lower self-compassion seem to be at higher-risk of developing persistent postpartum depressive symptoms. The promotion of women's self-regulatory skills may help them to relate to themselves in a way that assists them with the changes and challenges they are experiencing (Woekel, 2011), allowing them to be aware of and non-judgmentally accept their negative private parenting-related experiences (e.g., self-doubts, fear, and sadness), to have a more compassionate attitude toward their experiences and difficulties, and to manage to act in ways that promote good parenting practices and mother-child relationships (Woekel, 2011; Haga et al., 2012; Burke and Moore, 2015). These skills can globally translate into better postpartum adjustment.

Be a Mom: A Web-Based CBT Intervention to Prevent PPD

Be a Mom is a short-term, self-guided, web-based selective/indicated preventive intervention that targets women at-risk for PPD or those who present early-onset PPD symptoms (i.e., present scores above the cutoff score in instruments assessing risk factors for PPD and/or in postpartum depression screening measures). It is grounded in CBT principles and incorporates the recent contributions of third-wave CBT approaches applied to the perinatal context namely self-compassion and acceptance and commitment therapies (Klausen, 2005; Cree, 2015). Be a Mom is a structured program that has a modular setup including five modules, with each module addressing one or two specific thematic contents (Changes and Emotional Reactions; Cognitions; Values and Social Support; Couple's Relationship; PPD Alert Signs and Professional Help-seeking). The content of each module includes psychoeducational information about the specific thematic content and practical strategies to be implemented by the women during the following weeks. The information is presented in attractive formats (text, animation, and video) and through the incorporation of several content-related interactive exercises with personalized feedback on

the user's responses. The modules follow the structured and goal-oriented nature of CBT sessions: the module's goals are presented, followed by the module's thematic content (interchangeably with several interactive exercises), and a homework activity is presented at the end of each session to guarantee continued therapeutic practice. Although the Be a Mom program is completely self-guided in nature, asynchronous communication channels (e.g., reminders, email contact for program-related support) are available to enable communication.

Be a Mom targets the enhancement of core self-regulatory skills, such as emotion regulation, psychological flexibility and self-compassion, by helping women to: (a) be aware of, understand and non-judgmentally accept the diversity of their private experiences (emotions and thoughts) during the postpartum period; (b) use more psychologically flexible (e.g., acceptance, cognitive defusion) and self-compassionate ways to deal with such experiences; and (c) identify, create and clarify parenthood values while engaging in committed actions with such values (Fonseca et al., 2018c). Be a Mom also addresses perinatal-specific concerns (e.g., communication with the social network, the couple's relationship), which have been found to be important dimensions for perinatal women (O'Mahen et al., 2012). The iterative formative evaluation process that informed the design and the intervention components of Be a Mom is detailed elsewhere (Fonseca et al., 2018c).

Cognitive-Behavior Therapy approaches targeting the development of self-regulatory skills such as self-compassion and psychological flexibility have been found to be effective for several mental health conditions (Powers et al., 2009; Leaviss and Uttley, 2015). However, to our knowledge, these approaches have seldom been investigated with regard to the prevention and treatment of PPD. We have conducted a pilot study aiming to gather evidence of the Be a Mom's feasibility and acceptability, as well as preliminary evidence of Be a Mom's efficacy, in terms of primary (depressive symptoms) and secondary (anxiety symptoms, maternal confidence, negative thoughts, marital satisfaction) outcomes. Preliminary evidence suggests that Be a Mom is effective in reducing early-onset postpartum depressive symptoms when compared with a waiting-list control group, and consequently in preventing the establishment of a clinical diagnosis of PPD (Fonseca et al., 2018a). Moreover, women in the Be a Mom group were also found to present a greater reduction in anxiety symptoms when compared to the waiting-list control group, although no differences were found in the remaining secondary outcomes (Fonseca et al., 2018a). However, this study focused in preliminary group comparisons to ascertain the program's efficacy, without exploring the mechanisms of treatment response; thus, further research is needed to understand which processes are involved in the reduction of postpartum depressive symptoms among women who participated in the program and particularly whether the enhancement of self-regulatory skills may account for such reduction.

The Present Study: Exploring the Processes of Change

Although most of the existing research on psychological interventions has focused on their effectiveness, there has been increased recognition of the need to understand not only *if* a psychotherapeutic intervention works but also *how* it works. Gaining a better understanding of the processes underlying therapeutic change is vital to optimize treatment outcomes and to allow the refinement of existing treatment procedures by establishing a clearer connection between the target of an intervention and its observed outcomes (Hayes et al., 2007; Kazdin, 2007; Lemmens et al., 2016). The purpose of this study is to explore the processes underlying therapeutic changes in the Be a Mom intervention, which has shown preliminary evidence of its efficacy in a pilot RCT reported elsewhere (Fonseca et al., 2018a). Although the pilot trial was designed to examine the acceptability, feasibility and efficacy of the Be a Mom program, a secondary analysis of the gathered data allows an exploratory inspection of the processes underlying therapeutic change, by examining changes in self-regulatory skills over time and its association with the primary outcome (depressive symptoms). Specifically, this study aims to: (1) explore whether the participation in the Be a Mom program promotes the enhancement of self-regulatory skills by examining changes in self-regulatory skills among women who participated and those who did not participate in the program; and (2) examine whether changes in each of the self-regulatory skills (emotion regulation abilities, psychological flexibility, and self-compassion) are associated with changes in the outcome (depressive symptoms), among women who participated in the Be a Mom program.

METHODS

Study Design and Procedure

The trial is registered at clinicaltrials.gov (NCT03024645) and was approved by the Ethics Committees of Faculty of Psychology and Educational Sciences of University of Coimbra and of Centro Hospitalar e Universitário de Coimbra, EPE [CHUC]. This was a two-arm, open-label, pilot randomized controlled trial to assess the effectiveness of a web-based psychological intervention for preventing the establishment of a clinical diagnosis of PPD among at-risk women. Women were eligible to participate in the study if they were adult (≥ 18 years), in the early postpartum period (up to 3 months postpartum), and presented risk factors for PPD (i.e., a score equal to or above the cutoff score of 5.5 on the Postpartum Depression Predictors Inventory-Revised; Alves et al., 2018) and/or early-onset PPD symptoms (i.e., a score above the cutoff score of 9 in the Edinburgh Postpartum Depression Scale; Areias et al., 1996). Moreover, they needed to have access to a computer/tablet/smartphone and internet access at home and the ability to read and speak Portuguese and to be a Portuguese resident. The exclusion criteria were the presence of a serious medical condition (physical or psychiatric) in the mother or the infant (self-reported).

Women were recruited both in person (at the Maternity Daniel de Matos – CHUC, women were invited to participate in the study during their postpartum hospitalization and provided their contact information to be contacted by the researchers 4–6 weeks postpartum for assessment for eligibility criteria) and online (on social media websites, both through unpaid cross-posting and through paid boosting campaigns; women completed a web form where they provided their contact information to be contacted by the researchers 1–2 weeks later to be assessed for eligibility criteria). In both cases, the study goals and procedures were described, and the participants' and researchers' roles were clarified. All women gave their informed consent to participate in the study. Participants' enrollment in the study occurred between June 2017 and October 2017.

Participants who met the eligibility criteria were randomly assigned (simple randomization procedure; allocation rate 1:1) to either the intervention group with access to the Be a Mom program or to the wait-list control group. Randomization was assured by a third researcher (different from the two responsible for enrollment and assignment of the participants to the study groups) who had no information about the participants (except for their code). The randomization sequence was concealed from the two researchers responsible for the participants' enrollment and assignment to groups.

The study variables were assessed at baseline (Time 1 – T1) and post-treatment (Time 2 – T2). In the intervention group, women who completed Be a Mom received an automatic email inviting them to complete post-treatment assessments 2–3 days later. If women dropped out of the program, an automatic email was sent 8 weeks after registration. In the waiting-list control group, an email inviting participants to complete the assessment protocol was sent 8 weeks after T1. T1 and T2 assessment protocols were collected online through a survey platform (Limesurvey®) with secure access that prevented the same user from completing the survey more than once. The CONSORT 2010 guidelines and their extensions for pilot trials (Eldridge et al., 2016) and for ehealth (Eysenbach and Group, 2011) were considered.

Intervention and Control Arms

The intervention arm had access to the Be a Mom program, which was described above. Women assigned to the intervention arm were invited by email to register on the Be a Mom platform (beamom.pt; access to the program is restricted to invitation). Access to the program was free of cost, and no compensation was given to participants. Only after registering in the Be a Mom platform did the women have access to the five modules, which had to be accessed in order. The participants were instructed that they should complete one module per week, although a slower pace was allowed. They were also given the option of pausing the module and resuming the last page visited during subsequent access. Be a Mom includes only asynchronous communication channels (one reminder by email after 7 days without accessing Be a Mom; email contact for technical support). Participants in the waiting-list control arm were offered no intervention but were free to access other forms of care (as were all participants). At

the end of the pilot trial, participants in the control group were offered the opportunity to access Be a Mom.

Measures

Sociodemographic and Clinical Information

The women answered a self-report form including questions about sociodemographic (e.g., age, marital status, educational level, professional status, average monthly income, socioeconomic status and residence) and clinical data (e.g., psychopathological history, psychological/psychiatric treatment history). Infant's data (e.g., age, gender, gestational weeks at birth) were also collected.

Postpartum Depression Risk

The Portuguese version of the Postpartum Depression Predictors Inventory-Revised (PDPI-R, postnatal version; Alves et al., 2018) is an inventory developed to assess PPD risk factors (e.g., low socioeconomic status, low self-esteem, prenatal depression/anxiety, lack of social support, and child care stress) and was used to identify women who are at higher risk for developing PPD. The questionnaire is composed of 39 items, answered on a dichotomous scale (yes vs. no, except for the first two items in which participants report their marital and economic status). The PDPI-R total score ranges from 0 to 39, with higher scores indicating increased risk for PPD. In the Portuguese validation studies, a score of 5.5 or higher is indicative of higher PPD risk (Alves et al., 2018).

Depressive Symptoms

The Edinburgh Postpartum Depression Scale [EPDS] (Cox et al., 1987; Areias et al., 1996) was used to assess depressive symptoms (e.g., sadness and tearfulness), in terms of their presence and severity. The women were asked to rate, using a 4-point scale, how frequently they felt different symptoms in the previous 7 days. Higher scores were indicative of higher depressive symptoms. According to the Portuguese validation studies, a score above 9 is indicative of clinically relevant depression symptoms. In the present study, Cronbach's alpha values ranged from 0.74 (intervention group – T2) to 0.90 (control group – T1).

Emotion Regulation Abilities

To assess the women's emotion regulation abilities, the short version of the Difficulties in Emotion Regulation Scale [DERS-SF] (Kaufman et al., 2015) was used. The DERS-SF is a self-report questionnaire to assess difficulties in using adaptive emotional regulation strategies and comprises 18 items (e.g., "When I'm upset, I feel guilty for feeling that way") answered on a 5-point Likert scale (from 1 = Almost Never Applies to Me to 5 = Almost Always Applies to Me). The DERS-SF is organized into six dimensions (i.e., Non-acceptance of emotional responses, Lack of emotional awareness, Lack of emotional clarity, Difficulties engaging in goal-directed behaviors, Impulse control difficulties, and Limited access to emotion regulation strategies). It is also possible to compute a total score by summing all items, which was the approach used in this study. Higher scores were indicative of more difficulties in using adaptive emotional regulation strategies (i.e., less emotion regulation abilities). Cronbach's alpha values

ranged from 0.85 (intervention group – T2) to 0.91 (control group – T1).

Psychological Flexibility

To assess psychological flexibility, the Acceptance and Action Questionnaire-II [AAQ-II] (Bond et al., 2011; Pinto-Gouveia et al., 2012) was used. The AAQ-II comprises 7 items that measure the individual's degree of psychological inflexibility (i.e., the degree of experiential avoidance of inner negative experiences, e.g., "I'm afraid of my feelings") answered on a 7-point Likert scale (ranging from 1 = Never True to 7 = Always True). Higher scores are reflective of lower psychological flexibility (i.e., higher psychological inflexibility). In our sample, the Cronbach's alpha values ranged from 0.90 (intervention group – T1 and T2) to 0.92 (control group – T1).

Self-Compassion

The short version of the Self-Compassion Scale [SCS-SF] (Castilho et al., 2015) was used to measure the women's levels of self-compassion. The SCS-SF comprises 12 items (e.g., "When I'm going through a very hard time, I give myself the caring and tenderness I need") answered on a 5-point response scale (ranging from 1 to 5). The 12 items measure six components (i.e., self-kindness, self-judgment, common humanity, isolation, mindfulness, and overidentification). It is also possible to compute a total self-compassion score. Higher scores are indicative of higher self-compassion. The Cronbach's alpha values in our sample ranged from 0.84 (intervention group – T2) to 0.92 (control group – T1).

Data Analyses

Preliminary analyses to characterize the sample, the study variables and the pattern of missingness were conducted with the *Statistical Package for the Social Sciences* (IBMS SPSS, version 22.0). The Latent Change Score (LCS) models were estimated by maximum likelihood (ML) using the Mplus program, version 7 (Muthén and Muthén, 1998-2017).

For sample characterization, descriptive statistics and comparison tests (*t*-tests and chi-square tests, respectively, for continuous and categorical variables) were used to compare the sociodemographic and clinical characteristics between the intervention and control groups. Pearson correlations were computed to examine the associations between sociodemographic and study variables.

Missing endpoints at posttest ranged from 48/194 (24.7%) on EPDS to 55/194 (28.4%) on DERS-SF (Little's MCAR test $X^2_{21} = 28.57, p = 0.125$). Missing data were handled using the Full Information Maximum Likelihood (FIML) estimation, which draws on all available data to estimate model parameters without imputing missing values (Enders, 2010).

For each variable (emotion regulation abilities, psychological flexibility and self-compassion), univariate LCS (McArdle, 2009) were computed to summarize longitudinal data and to examine changes over time. In contrast with comparison analyses (which examine differences between people in two or more groups), LCS models focus on examining changes within people over time, considering a within-subjects approach (McArdle, 2009). The

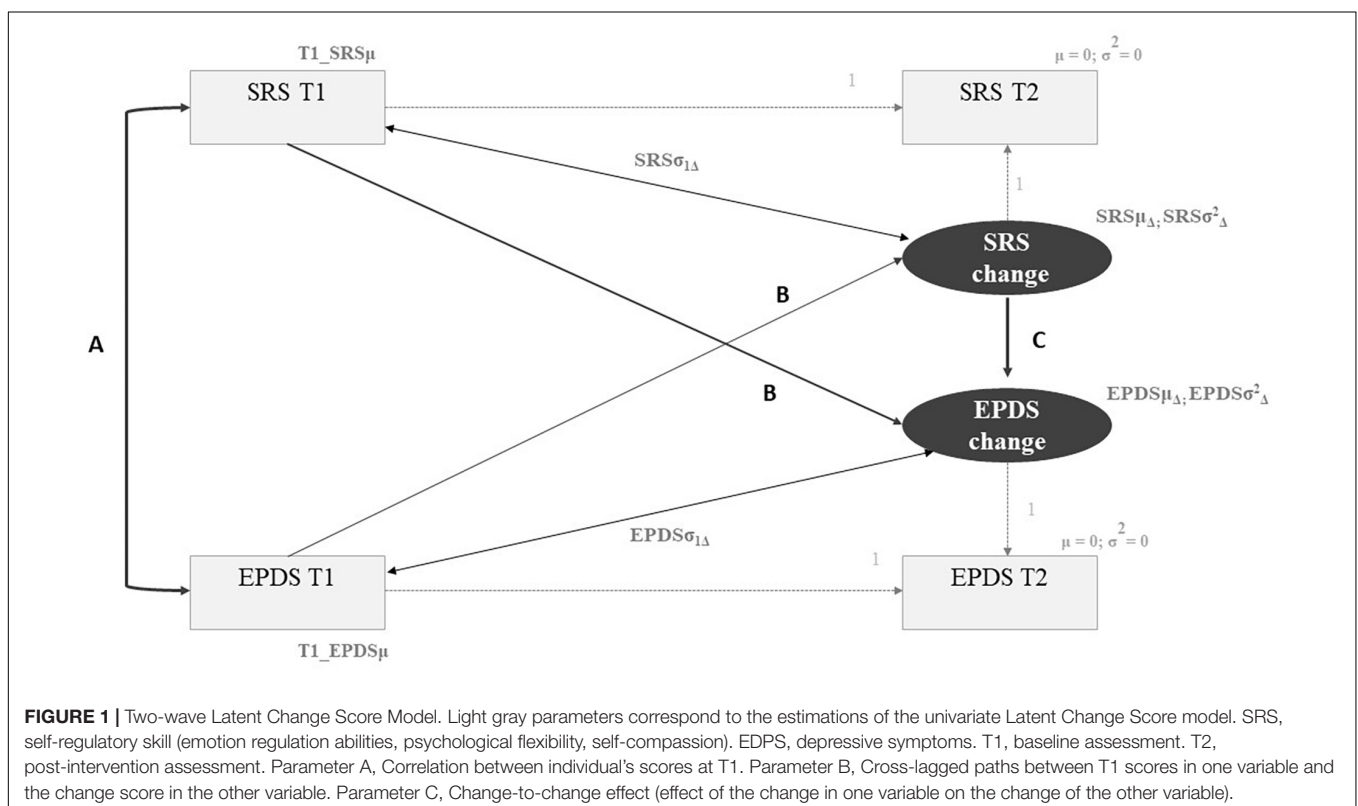
LCS specification is a structural equation modeling approach to modeling data that can represent change over time with either manifest or latent measures of a time-dependent outcome (McArdle, 2001, 2009).

Change between T1 and T2 was modeled as a latent factor (not directly measured; defined as the part of the score of the variable at T2 that is not identical to the score of the variable at T1, i.e., the difference between scores at T1 and T2), which allows the estimation of: (a) the mean/intercept of the change between T1 and T2 (μ_{Δ} , the average change over time, latent factor; a significant positive mean/intercept of the LCS factor suggests that, on average, an individual's scores increased from T1 to T2, while a significant negative mean/intercept suggests that the individual's scores decreased over time); (b) the variance/residual variance of the change between T1 and T2 (σ^2_{Δ} , the extent to which individuals differ in the change they manifest over time; a significant variance/residual variance in the LCS factor suggests heterogeneity across individuals regarding the averaged trajectory); (c) the covariance between the individual's score at T1 and the latent change factor ($\sigma_{1\Delta}$); and (d) the mean scores at T1 (McArdle, 2009; Henk and Castro-Schilo, 2016). To better illustrate the meaning of such estimates, we can bear in mind the following example considering the variable X. Each individual has a different score in the variable X at T1 and at T2. For each individual, it is possible to compute a change score (difference between T1 and T2). Considering the group of individuals, it is possible to compute a mean of the change scores (μ_{Δ} , the average change over time) and the deviation of each individual's change

score from the mean of change scores (σ^2_{Δ}), as well as the mean scores at T1. Finally, it is possible to examine the correlation between each individual's scores at T1 and his/her change score over time.

A multigroup model approach was used to check for differences between the intervention and the control group in the four key parameters estimated. First, a fully constrained model was computed in which all the previously mentioned parameters were constrained to be equal across groups. Second, an unconstrained model was computed in which the key parameters were allowed to vary across groups. If the unconstrained model showed a better fit to data than the constrained the model, then the parameters estimated (e.g., mean/intercept of the change score) are significantly different across groups. To allow for model identification and comparison, one of the parameters (the covariance between the individual's score at T1) remained fixed to be equal across groups.

Finally, to examine whether changes in each of the self-regulatory skills were associated with changes in women's depressive symptoms over time in the intervention group, three two-wave LCS models (2W-LCS; Henk and Castro-Schilo, 2016; Kievit et al., 2017; Valente and MacKinnon, 2017) were conducted. The graphical representation of the 2W-LCS model is depicted in **Figure 1**. In addition to the estimation of the four key parameters mentioned above (univariate LCS for each variable), this model allows the estimation of three additional parameters: (a) the correlation between an individual's scores on the self-regulatory skill and depressive symptoms at T1; (b)



the cross-lagged paths between T1 scores and the change score (i.e., the association between T1 scores of one variable and the change factor of the other variable); and (c) the change-to-change effect (i.e., the estimate of the effect of the change in one variable on the change of the other variable; a positive regression coefficient indicates that higher change scores in a variable are associated with higher change scores in the other variable, while a negative regression coefficient indicates that higher change scores in a variable are associated with lower change scores in the other variable).

We first tested a baseline model in which all three parameters were fixed to be zero. We gradually unconstrained the three parameters and examined changes in the model's fit in comparison with the prior model.

The goodness-of-fit of the models was assessed by relying on different criteria: a non-significant chi-square statistic ($p > 0.05$), CFI above 0.95 and a Root Mean Square Residuals Standardized (SRMR) below 0.08. Comparison between competing models was made performed based on chi-square difference tests (significant ΔX^2) and by comparing the goodness-of-fit indices of each model (Hu and Bentler, 1998, 1999; Kline, 2011). Significance was set at the level $p < 0.05$.

RESULTS

Participants

The flow of participants through the study is presented in **Figure 2**. Of the 643 women enrolled in the study, 142 were excluded, and 501 were assessed with regard to the presence of PPD risk and/or early-onset PPD symptoms (T0). Of these, 48% of women ($n = 241$) presented risk for PPD or early-onset PPD symptoms and were given baseline assessments, with a participation rate of 80.5%.

One hundred and ninety-four at-risk women were randomized, with 98 allocated to the intervention group (Be a Mom) and 96 allocated to the waiting-list control group. The baseline sociodemographic and clinical characteristics of the participants are presented in **Table 1**. Comparison analyses showed that the control group had a higher proportion of single women and of women with an average income lower than 1000€ (cf. **Table 1**). No additional differences were found. Associations between sociodemographic variables (marital status and income) and self-regulation skills were low and non-significant, except for the association between income and self-compassion (T1: $r = -0.204$, $p = 0.004$; T2: $r = -0.214$, $p = 0.011$). Income was introduced as a covariate in the models examining changes in self-compassion over time. Of the 98 women allocated to the intervention group, 41.8% ($n = 41$) completed the program.

Change in Self-Regulatory Skills Over Time: Comparisons Between Intervention and Control Groups

A univariate LCS model was tested for each self-regulatory skill (emotion regulation abilities, psychological flexibility, and

self-compassion) to examine changes over time. A multigroup model approach was used to check for differences between the intervention and the control groups in the average of change over time and its variance. The full constrained model (in which the LCS estimates were constrained to be equal across groups) was compared with the unconstrained model (in which the LCS parameters were free to vary across groups). Descriptive statistics and LCS estimates for each group are presented in **Table 2**.

TABLE 1 | Participants' sociodemographic and clinical characteristics at baseline.

	Intervention group ($n = 98$)	Control group ($n = 96$)	t/X^2
Women's sociodemographic characteristics			
Age (in years), M (SD)	32.22 (4.36)	32.94 (5.24)	1.03
Relationship, n (%)			
Married/living together	88 (89.8)	75 (78.1)	9.08*
Single	4 (4.1)	16 (16.7)	
Divorced	2 (2.0)	3 (3.1)	
In a relationship (not living together)	4 (4.1)	2 (2.1)	
Number of children, n (%)			
Primiparous	62 (63.3)	71 (74.0)	4.07
Multiparous (prior children)	36 (36.7)	25 (26.0)	
Educational level, n (%)			
Basic education (9th grade)	6 (6.1)	5 (5.2)	0.76
Secondary education	22 (22.4)	25 (26.0)	
Higher education	42 (42.9)	43 (44.8)	
Postgraduate education (M.Sc.; Ph.D.)	28 (28.6)	23 (24.0)	
Professional status, n (%)			
Employed	82 (83.7)	76 (79.2)	0.81
Unemployed/Other	16 (16.3)	20 (20.8)	
Monthly income, n (%)			
Less than 500€	3 (3.1)	5 (5.2)	57.78**
500€–1000€	16 (16.3)	50 (52.1)	
1000€–2000€	51 (52.0)	17 (17.1)	
2000€–3500€	22 (22.4)	3 (3.1)	
More than 3500€	6 (6.1)	21 (21.9)	
Socioeconomic status, n (%)			
Low	13 (13.3)	14 (14.6)	2.17
Medium/high	85 (86.7)	82 (85.4)	
Residence, n (%)			
Urban	74 (75.5)	70 (72.9)	0.17
Rural	24 (24.5)	26 (27.1)	
Women's clinical characteristics			
Psychopathology history, n (%)			
Yes	53 (54.1)	44 (45.8)	1.32
No	45 (45.9)	52 (54.2)	
Infant's characteristics			
Infant's Gender, n (%)			
Male	58 (59.2)	54 (56.2)	1.14
Female	40 (40.8)	42 (43.7)	
Infant's age (in months), M (SD)	2.00 (0.83)	1.99 (0.95)	–0.08

* $p < 0.05$, ** $p < 0.01$.

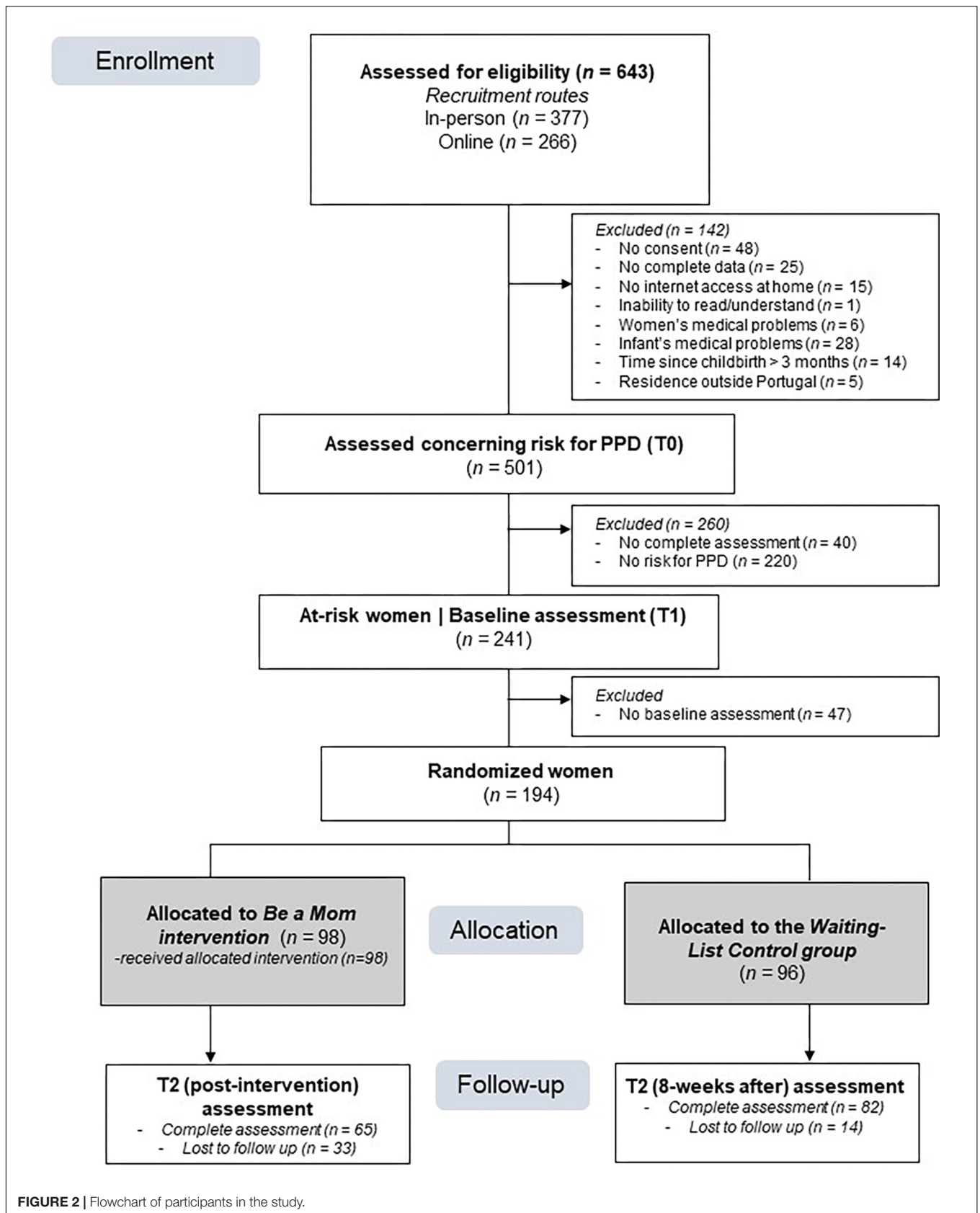


FIGURE 2 | Flowchart of participants in the study.

Emotion Regulation Abilities

Changes in emotion regulation difficulties from T1 to T2 were examined. The full constrained model presented a poor fit to the data ($\chi^2_4 = 22.10$, $p < 0.001$, CFI = 0.85, SRMR = 0.08), while the unconstrained model presented an acceptable fit ($\chi^2_1 = 7.00$, $p = 0.008$, CFI = 0.95, SRMR = 0.00). The comparison between models ($\Delta\chi^2_3 = 15.10$, $p < 0.001$) suggested that there were significant differences across groups. The LCS estimates (see **Table 2**) showed that the levels of emotion regulation difficulties had a greater decrease from T1 to T2 in the intervention group than in the control group and that the changes were heterogeneous across individuals in both groups. The covariance between the levels of emotion regulation difficulties at T1 and the amount of change over time was also significant ($\sigma_{1\Delta} = -59.02$, $SE = 9.76$, $Z = -6.05$, $p < 0.001$), suggesting that the higher the emotional regulation difficulties scores at T1, the greater the decrease in change scores.

Psychological Flexibility

Changes in psychological inflexibility from T1 to T2 were investigated. The full constrained model yielded a very good fit to the data ($\chi^2_4 = 1.94$, $p = 0.747$, CFI = 1.00, SRMR = 0.04). The model fit of the unconstrained model was also very good ($\chi^2_1 = 0.43$, $p = 0.510$, CFI = 1.00, SRMR = 0.03). The comparison between models ($\Delta\chi^2_3 = 1.51$, $p > 0.05$) suggested that the more parsimonious model was the one in which the LCS estimates were constrained to be equal across groups. The LCS estimates suggested that the levels of psychological inflexibility decreased from T1 to T2 ($\mu_{\Delta} = -1.78$, $SE = 0.48$, $Z = -3.67$, $p < 0.001$) and that the changes were heterogeneous across individuals ($\sigma^2_{\Delta} = 35.60$, $SE = 4.24$, $Z = 8.40$, $p < 0.001$). The covariance between the levels of psychological inflexibility at T1 and the amount of change over time was significant ($\sigma_{1\Delta} = -28.13$, $SE = 5.01$, $Z = -5.61$, $p < 0.001$), suggesting that the higher the levels of psychological inflexibility at T1, the greater the decrease in change scores.

Self-Compassion

With regard to changes in self-compassion levels from T1 to T2, income was first introduced in the constrained model as a covariate, but no significant associations with self-compassion levels at T1 ($p = 0.07$) or T2 ($p = 0.867$) were found. Therefore, it was removed from the model, to decrease the number of

parameters to be estimated. The full constrained model presented an acceptable fit to the data ($\chi^2_4 = 14.14$, $p = 0.007$, CFI = 0.92, SRMR = 0.16), while the unconstrained model presented a very good fit ($\chi^2_1 = 1.71$, $p = 0.191$, CFI = 0.99, SRMR = 0.00). The comparison between models ($\Delta\chi^2_3 = 12.43$, $p < 0.001$) suggested that there were significant differences across groups. The LCS estimates (see **Table 2**) showed that the intervention group had a greater increase in self-compassion levels from T1 to T2 than the control group. The covariance between the levels of self-compassion at T1 and the amount of change over time was significant ($\sigma_{1\Delta} = -26.82$, $SE = 4.87$, $Z = -5.51$, $p < 0.001$), suggesting that lower scores of self-compassion at T1 were associated with a greater increase in change scores.

Association Between Changes in Self-Regulatory Skills and Depressive Symptoms in the Intervention Group

Three two-wave LCS models were estimated to examine the effects of changes in each self-regulatory skill on changes in depressive symptoms. **Table 3** presents the unstandardized parameter estimates from the two-wave LCS model for each of the estimated models.

Emotion Regulation Abilities and Depressive Symptoms

A model examining the effect of changes in emotional regulation difficulties on changes in depressive symptoms over time was estimated. A baseline model, in which the three parameters of two-wave LCS (correlation between individual scores at T1, cross-lagged paths between T1 scores and change score and change-to-change effect) were fixed to be zero, was first estimated. The parameters were gradually unfixed and changes in the model's fit were observed to select the final model.

The baseline model presented a poor fit to the data ($\chi^2_4 = 29.08$, $p < 0.001$; CFI = 0.268, SMRM = 0.170). The LCS scores for changes in difficulties in emotion regulation ($\mu_{\Delta} = -4.33$, $p < 0.001$) and for depressive symptoms ($\mu_{\Delta} = -2.25$, $p < 0.001$) were significant, suggesting a significant reduction in the levels of both variables from T1 to T2.

The model in which the correlation between T1 scores was free to vary showed greater improvement when compared to the baseline model ($\chi^2_3 = 12.57$, $p < 0.006$, CFI = 0.72, SRMR = 0.08;

TABLE 2 | Changes in self-regulatory skills over time in the intervention and control groups: Descriptives and Univariate Latent Change Scores estimates.

	Descriptives				Univariate latent Change Scores (LCS)			
	Intervention group		Control group		Intervention group		Control group	
	T1 M (SD)	T2 M (SD)	T1 M (SD)	T2 M (SD)	μ_{Δ}	σ^2_{Δ}	μ_{Δ}	σ^2_{Δ}
Diff. Emot. Reg.	40.80 (12.32)	36.95 (9.39)	36.99 (12.35)	34.74 (10.66)	-4.35***	87.96***	-2.05**	51.29***
Psych. Inflex.	21.05 (8.98)	18.52 (7.19)	19.63 (9.53)	18.37 (8.863)	-2.26**	34.38***	-1.34*	36.32***
Self-Compassion	37.65 (8.04)	40.91 (6.91)	41.02 (9.68)	43.05 (9.07)	3.46***	45.99***	1.75**	30.33***

Diff. Emot. Reg., Difficulties in Emotion Regulation; Psych. Inflex., Psychological Inflexibility; T1, baseline assessment; T2, post-intervention assessment; μ_{Δ} , mean/intercept of the latent change factor; σ^2_{Δ} , variance of the latent change factor. The LCS estimates presented correspond to the unconstrained model (where LCS parameters were free to vary across groups). Unstandardized estimates are presented. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

TABLE 3 | Change-to-change effects of self-regulatory skills on depressive symptoms: unstandardized parameter estimates from the Two-Wave Latent Change Score models.

	Model 1: Difficulties in emotion regulation and depressive symptoms		Model 2: Psychological inflexibility and depressive symptoms		Model 3: Self-compassion and depressive symptoms	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Means/intercepts						
μ_{Δ} SRS	-4.38***	1.20	-2.39**	0.718	3.53***	0.84
μ_{Δ} EPDS	-1.75***	0.46	-1.954***	0.464	-1.77***	0.48
Variance/residual variance						
σ^2_{Δ} SRS	104.58***	17.76	36.46***	6.54	50.30***	8.78
σ^2_{Δ} EPDS	13.47***	2.24	14.59***	2.37	13.93***	2.26
Correlations						
T1 SRS, T1 EPDS	18.86***	4.74	16.18***	3.61	-13.07***	3.17
T1 SRS, Δ EPDS	-6.56*	2.75	-3.60	1.90	3.79	1.96
Predictive path						
Δ SRS \rightarrow Δ EPDS	0.115**	0.038	0.10	0.07	-0.14*	0.06

SRS, Self-regulatory skill (in model 1: difficulties in emotion regulation, in model 2: psychological inflexibility, in model 3: self-compassion). EPDS, Depressive symptoms. μ_{Δ} , average change over time. σ^2_{Δ} , variance/residual variance of change. T1, Time 1. Δ EPDS, Latent change EPDS score. Δ SRS, Latent change self-regulatory skill score. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

$\Delta\chi^2_1 = 16.51, p < 0.001$). Subsequently, a model in which the cross-lagged paths between T1 and change scores were free to vary was tested. Although the chi-square difference from the prior model was non-significant ($\Delta\chi^2_1 = 1.84, p < 0.05$), the goodness-of-fit indices of the model improved slightly ($\chi^2_2 = 10.73, p < 0.004, CFI = 0.75, SRMR = 0.07$). Finally, the model in which the change-to-change effects were free to vary was tested, showing a very good fit to the data ($\chi^2_1 = 2.09, p = 0.150, CFI = 0.97, SRMR = 0.055; \Delta\chi^2_1 = 8.64, p < 0.01$).

The parameter estimates of the final model (see **Table 3**) showed a positive association between changes in difficulties in emotion regulation and changes in depressive symptoms: a greater decrease in difficulties in emotion regulation levels was associated with a greater decrease in the levels of depressive symptoms. Women's levels of difficulties in emotion regulation were positively associated with their levels of depressive symptoms at T1. Additionally, a negative and significant association between T1 scores on emotion regulation difficulties and change in depressive symptoms was found, suggesting that women's higher levels of emotion regulation difficulties at T1 were associated with a greater decrease in depressive symptoms from T1 to T2.

Psychological Flexibility and Depressive Symptoms

A model examining the effect of changes in psychological inflexibility on changes in depressive symptoms over time was estimated.

The baseline model showed a very poor fit to the data ($\chi^2_4 = 37.75, p < 0.001, CFI = 0.42, SMRM = 0.238$). The LCS scores showed a significant decrease over time of both psychological inflexibility ($\mu_{\Delta} = -2.27, p = 0.002$) and depressive symptoms ($\mu_{\Delta} = -2.25, p < 0.001$).

The unconstrained model in which T1 scores were allowed to correlate resulted in a significant improvement compared to the

baseline model ($\chi^2_3 = 4.09, p = 0.25, CFI = 0.98, SMRM = 0.067; \Delta\chi^2_1 = 33.66, p < 0.001$). The model in which the cross-lagged paths between T1 and change scores were allowed to vary resulted in a non-significant chi-square difference from the prior model ($\Delta\chi^2_1 = 2.17, p > 0.05$) but a slight improvement of goodness-of-fit indices ($\chi^2_2 = 1.92, p = 0.38, CFI = 1.00, SMRM = 0.029$). Finally, the model in which the change-to-change effect was unconstrained resulted in a non-significant improvement in the chi-square statistic ($\Delta\chi^2_1 = 1.77, p > 0.05$) and in a non-relevant improvement in the goodness-of-fit indices ($\chi^2_1 = 0.15, p = 0.699, CFI = 1.00, SMRM = 0.014$).

This finding is congruent with the parameter estimates in the final model (see **Table 3**): no significant association was found between the women's change in their levels of psychological inflexibility and the women's change in their levels of depressive symptoms over time. Women's levels of psychological inflexibility and depressive symptoms were associated at T1. No significant association was found between women's psychological inflexibility at T1 and their levels of change in depressive symptoms.

Self-Compassion and Depressive Symptoms

A model examining the effect of changes in self-compassion on changes in depressive symptoms over time was estimated. The baseline model showed a very poor fit to the data ($\chi^2_4 = 31.06, p < 0.001, CFI = 0.16, SMRM = 0.193$). The LCS scores showed a significant increase over time in the levels of self-compassion ($\mu_{\Delta} = 3.43, p < 0.001$) and a significant decrease over time in the levels of depressive symptoms ($\mu_{\Delta} = -2.25, p < 0.001$).

The model in which the correlation between T1 scores was unconstrained resulted in a great improvement when compared to the baseline model ($\Delta\chi^2_1 = 23.94, p < 0.001$), although the goodness-of-fit indices continued to reveal a poor adjustment to data ($\chi^2_3 = 7.12, p = 0.006, CFI = 0.87,$

SRMR = 0.08). There was a slight improvement in the goodness-of-fit indices in the second model, in which the cross-lagged paths were unconstrained ($\chi^2_2 = 6.10, p = 0.004, CFI = 0.87, SRMR = 0.055$), although the chi-square difference was non-significant ($\Delta\chi^2_1 = 1.10, p > 0.05$). The final model, in which the change-to-change effects were unconstrained, showed the best fit to the data ($\chi^2_1 = 0.44, p = 0.510, CFI = 1.00, SRMR = 0.034; \Delta\chi^2_1 = 5.66, p < 0.01$).

The parameter estimates of the final model (see **Table 3**) showed a negative association between changes in self-compassion and changes in depressive symptoms: a greater increase in women's self-compassion levels was associated with a greater decrease in women's depressive symptoms. Women's levels of self-compassion were associated with their depressive symptoms at T1 and women's levels of self-compassion at T1 were not associated with the levels of change in their depressive symptoms over time.

DISCUSSION

Although this study was exploratory, its results represent an innovative contribution in the context of preventive interventions for PPD by providing some insight into the processes that underlie treatment response to the Be a Mom program. Be a Mom has shown preliminary evidence of efficacy in reducing depressive symptoms among at-risk women in the early post-partum period, and thus preventing the establishment of a clinical diagnosis of PPD (Fonseca et al., 2018a). Although Be a Mom was developed to target the enhancement of self-regulatory skills such as emotion regulation abilities, psychological flexibility and self-compassion (Fonseca et al., 2018c), further evidence was needed to establish whether these self-regulatory skills are effectively promoted within the program and whether they result in a significant reduction in the levels of depressive symptoms.

The first main finding of our study suggests that Be a Mom promotes the enhancement of emotion regulation abilities and self-compassion. Women who participated in Be a Mom showed a greater decrease in emotion regulation difficulties and a greater increase in self-compassion from baseline to post-intervention assessment when compared to women who did not participate in the program. In its first module, one of Be a Mom's goals is to help women normalize and identify the diversity of their emotional experiences and promote its non-evaluative acceptance (Fonseca et al., 2018c). This may be of particularly importance, as transition to parenthood is usually viewed by society as a period of happiness and joy (Sutherland, 2010); the ability to accept that negative emotions are also part of the motherhood experience may help women to deal in a more adaptive way with the challenges posed by motherhood, as they are not focused in trying to avoid or control such negative emotions. The information and exercises proposed within the first module may have prompted women to increase the clarity (identification) and awareness of the emotions they experienced, to increase their acceptance of

such emotions even if they were negative, and consequently to engage more in adaptive emotion regulation strategies and goal-directed behaviors, thereby enhancing their emotion regulation abilities. The enhancement of a more compassionate attitude toward themselves is promoted throughout the entire program, but particularly in the first and second modules of Be a Mom. A more self-compassionate attitude may help women to perceive the difficulties and challenges (e.g., difficulties in caregiving tasks, lack of time for themselves, changes in the relationship with the partner or friends) and negative experiences of motherhood (e.g., negative emotions and thoughts) as part of the human experience, and to act in a kind and warm way toward themselves when confronted with such difficult experiences, rather than being self-critical (Neff, 2009) and blaming themselves for not being "the perfect mother." In the first module, women were educated about the negative effects of sociocultural myths of perfect motherhood and its associated unrealistic expectations (e.g., feelings of failure) and were offered some exercises that may have paved the way to a more self-compassionate approach to managing such expectations, accepting that they are vulnerable and human like all mothers. Similarly, in the second module, women were educated about the pervasive role of self-criticism in dealing with individual failures and suffering and were offered some exercises that aimed to promote a kinder and more compassionate attitude toward themselves in the maternal role, which may have contributed to increasing their levels of self-compassion.

Contrary to our expectations, there was a significant decrease in psychological inflexibility over time, but this decrease was equal in both groups, suggesting that Be a Mom did not contribute to the enhancement of psychological flexibility. Two reasons may help to explain these findings. On the one hand, psychological flexibility involves not only an accepting and non-judgmental way to deal with negative emotions and cognitions, which is promoted from the first module of Be a Mom but also the clear identification of an individual's values and engagement in committed behaviors with such values (Hayes et al., 2006), which is targeted only in the third module. It is possible that the Be a Mom's users who dropped out without completing the program may not have had the opportunity to learn such skills in an effective way. Additionally, the identification of parenthood values may be a time-consuming task, and the engagement in valued-based parenting behaviors is dependent upon clear identification. Therefore, it is possible that the strategies used to promote psychological flexibility within Be a Mom required more practice and time for their benefits to be observable. Further studies should examine whether the enhancement of psychological flexibility may be observable in follow-up assessments. On the other hand, it is possible that the questionnaire used to assess psychological inflexibility, which mainly targeted one of its dimensions (i.e., experiential avoidance), may not have adequately captured changes in the different dimensions of this construct (e.g., cognitive fusion, lack of value clarity), particularly considering the parenting context (Greene et al., 2015).

The results of this study provide valuable information on the relation between the core psychological processes targeted in the Be a Mom program and its observed outcomes. In particular, the second main finding of this study is that changes in difficulties in emotion regulation and in self-compassion over time were significantly associated with changes in depressive symptoms among women who participated in the Be a Mom program. First, baseline scores on self-regulatory skills and depressive symptoms were significantly associated, with women who presented poorer self-regulatory skills (more emotion regulation difficulties, high psychological inflexibility and low self-compassion) showing higher levels of depressive symptoms. These results were congruent with prior research that has suggested that poorer emotion regulation (Haga et al., 2012; Marques et al., 2018), higher psychological inflexibility (Zhu et al., 2015; Fonseca et al., 2018b) and poorer levels of self-compassion (Felder et al., 2016) may increase the likelihood of postpartum depressive symptoms. Without clinical intervention, these poorer self-regulatory skills may also contribute to the persistent nature of depressive symptoms over time, leading to the establishment of a clinical diagnosis of PPD. They, therefore, are important targets of preventive efforts.

Second, the enhancement in self-regulatory skills (emotion regulation abilities and self-compassion) in women who participated in Be a Mom seemed to exert a protective effect in the presence of PPD risk factors because it led to a reduction of depressive symptoms. The greater women's ability to enhance such skills in the postpartum period, the greater their ability to deal with the private negative experiences (emotions and thoughts) associated with their parenting experience by being more aware and accepting of such emotions and by using more adaptive emotion regulation strategies (Haga et al., 2012). These women may also be able to adopt a kinder and more self-compassionate attitude toward their own experiences (Felder et al., 2016; Fonseca and Canavarro, 2018), which may help them to better address the unrealistic expectations of "perfect motherhood," accept their vulnerable and human nature and be less judgmental toward themselves in the presence of motherhood-related negative experiences, both external and internal (e.g., thoughts/emotions) (Fonseca and Canavarro, 2018).

Finally, the results showed that the women's scores on emotion regulation difficulties at baseline were associated with the degree of change in depression symptoms over time, suggesting that women who presented higher emotion regulation difficulties at baseline showed a greater decrease in depressive symptoms. One possible explanation for these results is that women who present more difficulties in regulating their emotions may be more prone to engage with the program's information and exercises because they may find the program's content more relevant to their needs, which may translate into significant benefits in terms of their depressive symptoms. However, further studies should examine this hypothesis.

Several limitations should be taken into consideration when interpreting our results. First, this study corresponds to a secondary analysis of the results of a pilot randomized trial conducted to evaluate Be a Mom's feasibility and acceptability as

well as to provide preliminary evidence of its efficacy (Fonseca et al., 2018a). However, randomization was not completely successful because the intervention and the control groups differed in terms of sociodemographic characteristics (marital status and income). The potential influence of such covariates was considered in preliminary analyses to minimize these limitations. Moreover, the dropout rate between baseline and post-intervention assessment may have influenced the results found because the women who dropped out of the study may have experienced fewer benefits in emotional adjustment than those who completed the study. However, following the intention-to-treat principles, we used a statistical approach that handled missing data to attempt to minimize the influence of study dropouts. Second, given the pilot nature of the study, the sample size and the number of assessment times were limited. Further studies with larger samples and additional follow-up assessments will allow further inspection of the processes of change over time in self-regulatory skills among women who participate in Be a Mom in both the short-term and the long-term.

Nonetheless, this study complements prior evidence of Be a Mom's efficacy and shows that Be a Mom is effective not only in reducing depressive and anxiety symptoms (Fonseca et al., 2018a) but also in promoting targeted self-regulatory skills. Moreover, this study provides a valuable contribution to research on the processes of therapeutic change (Hayes et al., 2007; Kazdin, 2007) of (web-based) preventive CBT interventions for PPD by showing the link between changes in self-regulatory skills and changes in depressive symptoms among Be a Mom's users.

AUTHOR CONTRIBUTIONS

AF designed the study, collaborated in the study implementation (randomization of participants), performed the data analyses, and wrote the manuscript. FM and SA were responsible for data collection and revised the final draft of the manuscript. RG and MC collaborated in the design of the study and in the revision of the final manuscript.

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Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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A Randomized Control Trial Evaluating an Online Mindful Parenting Training for Mothers With Elevated Parental Stress

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Objectives: The prevalence of maternal stress in early years of parenting can negatively impact child development. Therefore, there is a need for an early intervention that is easily accessible and low in costs. The current study examined the effectiveness of an 8-session online mindful parenting training for mothers with elevated levels of parental stress.

Methods: A total of 76 mothers were randomized into an intervention ($n = 43$) or a waitlist control group ($n = 33$). The intervention group completed pretest assessment prior to the online intervention. Participants completed a post intervention assessment after the 10 weeks intervention and a follow-up assessment 10 weeks later. The waitlist group completed waitlist assessment, followed by a 10-week waitlist period. After these 10 weeks, a pretest assessment took place, after which the waitlist group participants also started the intervention, followed by the posttest assessment. Participating mothers completed questionnaires on parental stress (parent-child interaction problems, parenting problems, parental role restriction) and other maternal (over-reactive parenting discipline, self-compassion, symptoms of depression and anxiety) and child outcomes (aggressive behavior and emotional reactivity) while the non-participating parents (father or another mother) were asked to also report on child outcomes.

Results: The online mindful parenting intervention was shown to be significantly more effective at a 95% level than a waitlist period with regard to over-reactive parenting discipline and symptoms of depression and anxiety (small and medium effect sizes), and significantly more effective at a 90% level with regard to self-compassion, and mother-rated child aggressive behavior and child emotional reactivity (small effect sizes). The primary outcome, parental stress, was found to have a 95% significant within-group effect only for the subscale parental role restriction (delayed small effect

size improvement at follow-up). No significant improvements on child outcomes were found for the non-participating parent.

Conclusion: To conclude, the results provide first evidence that an online mindful parenting training may be an easily accessible and valuable intervention for mothers with elevated levels of parental stress.

Keywords: mindful parenting, online intervention, parental stress, early intervention, behavior problems

INTRODUCTION

A child's social, emotional, behavioral, cognitive and physical development in the first years of life is an important foundation for later development (Briggs-Gowan et al., 2006; Feldman and Eidelman, 2009; Bornstein et al., 2010). The development of children is supported in a positive manner when they have the possibility to build a secure relationship with their parents, in which the parents are supportive and sensitive (Deater-Deckard, 2005; Bernier et al., 2010). An important risk factor for problems in parenting behavior and the parent-child relationship is parental stress (Mills-Koonce et al., 2011; McMahon and Meins, 2012). Parental stress does not only have negative consequences for child development via certain parenting practices and behaviors, but is also directly related to problems in social, emotional and behavioral development (Anthony et al., 2005; Crnic et al., 2005). Even when parents do not fall into certain "parenting traps" associated with elevated levels of parental stress, children may be affected by parental stress through the emotional climate in the family or through observational learning of parental emotion regulation (Morris et al., 2007).

Parental stress is defined as the aversive psychological reaction to the demands of parenthood (Deater-Deckard, 1998). Child, parent, family and environmental factors influence the level of stress that parents experience (Östberg and Hagekull, 2000). A prospective study that investigated parental stress and child behavior problems in families with children aged 3 to 9, showed that a high level of child behavior problems is a risk factor for parental stress and vice versa (Anthony et al., 2005; Neece et al., 2012). A vicious cycle with increasing levels of both parental stress and child behavior problems can lead to negative consequences for the quality of the parent-child interaction and the security of their relationship (Ciciolla et al., 2014; Lewallen and Neece, 2015).

Parents differ in their capacity to deal with and regulate parental stress (Leerkes et al., 2017). Parents with high levels of stress and low regulatory capacity, have a higher risk of being "over-reactive" toward their children in difficult parenting situations (Prinz et al., 2007; Lorber, 2012). Over-reactive parenting can be described as a parent's tendency to respond with impatience and anger to problematic behavior of their children (Prinz et al., 2007). Over-reactivity in parenting is found to be predictive of child externalizing problems (O'Leary et al., 1999; Miller-Lewis et al., 2006). A longitudinal study of families with adopted children (ages 9 to 27 months) showed that genetic risk for negative emotionality predicted child negative

emotionality only when the adoptive mothers showed a high level of over-reactive parenting (Lipscomb et al., 2012).

Parents with mental health problems seem to be more susceptible to higher levels of parental stress. In the postpartum period, elevated symptoms of depression or anxiety were associated with elevated levels of parental stress (Crugnola et al., 2016). Mothers with postpartum depression continued to show elevated levels of parental stress when their child was 3 years of age (Milgrom et al., 2006). Not only parental stress, but also parental mental health problems have negative consequences for the parent-child relationship (Siegel and Hartzell, 2003). Therefore, a combination of mental health problems and parental stress may increase parents' vulnerability in their parenting role. Although one could expect treatment of mental health problems to be beneficial not only for the mother's well-being, but also with regard to parenting, the parent-child relationship, and the child's well-being and development, this may not necessarily be the case (Milgrom et al., 2006; Kersten-Alvarez et al., 2011; Murray et al., 2014). Treatment of parents with a combination of mental health and parenting problems should not only focus on reducing their mental health problems, but also on reducing levels of parental stress, improving parental bonding to the child, and improving the quality of parent-child interaction.

Furthermore, parents with low levels of self-compassion have an increased likelihood of experiencing high levels of parental stress. An association between low self-compassion and parental stress was shown both in a community sample (Gouveia et al., 2016), and in parents of children with autism (Beer et al., 2013; Neff and Faso, 2015). The support that parents with a high level of self-compassion are able to obtain, may make them more resilient against parental stress (Neff and Faso, 2015), similar to the effect of social support on parental resilience (Horton and Wallander, 2001).

It has become clear how parental vulnerabilities (high psychopathology, low regulatory capacity and self-compassion), child vulnerabilities (difficult temperament, behavior problems), family and environmental factors contribute to parental stress. Specific developmental challenges associated with the age of the child may also play a role. Parents of toddlers are faced with the challenge of navigating between respecting the high need for autonomy in toddlers, and the high need for regulatory support (Early Child Care Research Network. [NICHD], 2004). Toddlers' limited ability to regulate emotions and behavior may result in non-compliance, aggression, impulsivity and hyperactive behavior, which makes a certain level of parental stress normal in the toddler period. However, Deater-Deckard (1998) emphasized that even though some parental stress is normal, variation in both

the normal and the extreme ranges of parental stress have been linked to adjustment in parents and children. Parental stress early in the child's life has also been shown to be predictive of parental stress later in middle childhood (Östberg et al., 2007).

It is therefore important to provide parents who are experiencing elevated levels of parental stress with an intervention focused on coping with and reducing parental stress. In most parent training programs, a reduction of parental stress is achieved by teaching parents certain (cognitive behavioral) parenting techniques (Lundahl et al., 2006). However, Neece et al. (2012) posited the possibility of reducing parental stress by providing parents stress management trainings. Mindfulness training in the form of a mindfulness-based stress reduction training (MBSR; Kabat-Zinn, 1990) is being used world-wide for different kinds of stress-related complaints. Mindful parenting training is an adapted intervention that is specifically aimed at helping parents cope with, and regulate, their parental stress (Bögels et al., 2014; Potharst et al., in press a).

Mindful parenting can be defined as the ongoing process of intentionally bringing moment-to-moment, non-judgmental awareness as best one can to the unfolding of one's own lived experience, including parenting (Kabat-Zinn and Kabat-Zinn, 1997). This non-judgmental moment-to-moment awareness can support parents in becoming aware of increasing levels of stress, accepting the situation and their own feelings, regulating their feelings, and making a more conscious decision instead of giving an impulsive reaction that is driven by stress. It can also aid parents in becoming more attentive toward their children, to what they communicate (both in words and by the non-verbal signals provoked), and in terms of emotional availability. Although Mindful Parenting training has mainly been applied to parents of children with psychopathology or developmental problems (Singh et al., 2007; Bögels et al., 2014; Meppelink et al., 2016; Emerson et al., in press), it has also been shown to be effective in reducing parental stress in a preventive setting (Potharst et al., in press a). A study by Potharst et al. (in press b) showed that a Mindful Parenting training adjusted for mothers with a toddler, the "Mindful with your toddler" training, was effective in reducing parental stress, as well as in improving mother-child interactions, and child behavior problems.

The fact that so many parents experience, or are at risk for high levels of parental stress when their child is at the toddler age calls for early interventions that are both easily accessible and low in costs. The use of internet has facilitated offering available interventions to large populations while keeping the societal costs low. Mindfulness-based interventions have also been adjusted to an internet format. This has additional benefits, such as reduced waiting time before the start of an intervention, freedom to pursue the intervention from home in one's own time and pace, and anonymity (Spijkerman et al., 2016). In a meta-analysis, Spijkerman et al. (2016) showed that mindfulness-based internet interventions were not only effective in reducing stress (medium effect size), but also symptoms of depression and anxiety, as well as improving well-being and mindfulness (small effect sizes). In this meta-analysis, no mindfulness interventions for parents were included. Another meta-analysis on online non-mindfulness based parenting programs showed that online parenting interventions were

effective in improving both parental outcomes (medium effect size) and child outcomes (small effect size; Nieuwboer et al., 2013). In this meta-analysis, it was concluded that online interventions have the potential to not only increase parental knowledge, but also to improve parental attitude, parenting abilities and behavior (Nieuwboer et al., 2013).

This study investigated the effectiveness of an online mindful parenting training for mothers with young children who experience parental stress. It utilized a randomized controlled design, with an intervention group and a waitlist control group. It was hypothesized that the online mindful parenting training would (1) decrease parental stress, (2) decrease over-reactive parenting discipline, (3) improve mindful parenting and self-compassion, (4) decrease maternal symptoms of anxiety and depression, and (5) decrease child behavior problems.

MATERIALS AND METHODS

Participants

During the perinatal period, all participating mothers of the current study took part in a large longitudinal cohort study based in the Southern region of the Netherlands: the Holistic Approach to Pregnancy and the first Postpartum Year (HAPPY) study. A detailed protocol of the HAPPY study has previously been described (Truijens et al., 2014). Inclusion criteria for participation in the cohort study were: singleton pregnancy and a sufficient understanding of the Dutch language. Exclusion criteria were: chronic disease (e.g., diabetes, thyroid dysfunction), severe psychopathology (e.g., schizophrenia, borderline personality disorder, bipolar disorder) and very preterm childbirth (gestational age < 32 weeks). Following the HAPPY study, a subsample of approximately 500 mothers and their toddlers participated in the HAPPY follow study and were assessed at 2 and/or 3–3.5 years postpartum, and completed the Parental Stress Questionnaire (PSQ; Vermulst et al., 2012). Of 504 women who completed the PSQ, 209 (41%) showed an elevated level of parental stress (T-score ≥ 64) on at least one of three subscales related to parenting, namely (1) parent child relationship problems, (2) parenting problems, and (3) parental role restriction. These 209 mothers with elevated levels of parental stress were eligible for the current study, and were invited by e-mail. Of the invited mothers, 127 (61%) did not respond to, or declined the invitation. Of the 82 mothers that accepted the invitation, six mothers (7%) failed to return informed consent. Thus, a total of 76 women were included in the current study and were randomized to either an intervention group ($n = 43$) or a waitlist group ($n = 33$) (see **Figure 1**).

Sample size calculation was based on an expected medium effect size improvement in parental stress (Spijkerman et al., 2016). To achieve a power of 80% to find a significant interaction between-within subjects, with 10% alpha, 100 participants were needed (50 per treatment group). It was predicted that these numbers could be included, because we expected the percentage of eligible mothers that chose to participate in the study to be higher (50%). The fact that both groups were smaller than proposed may have negatively influenced the power of the current study.

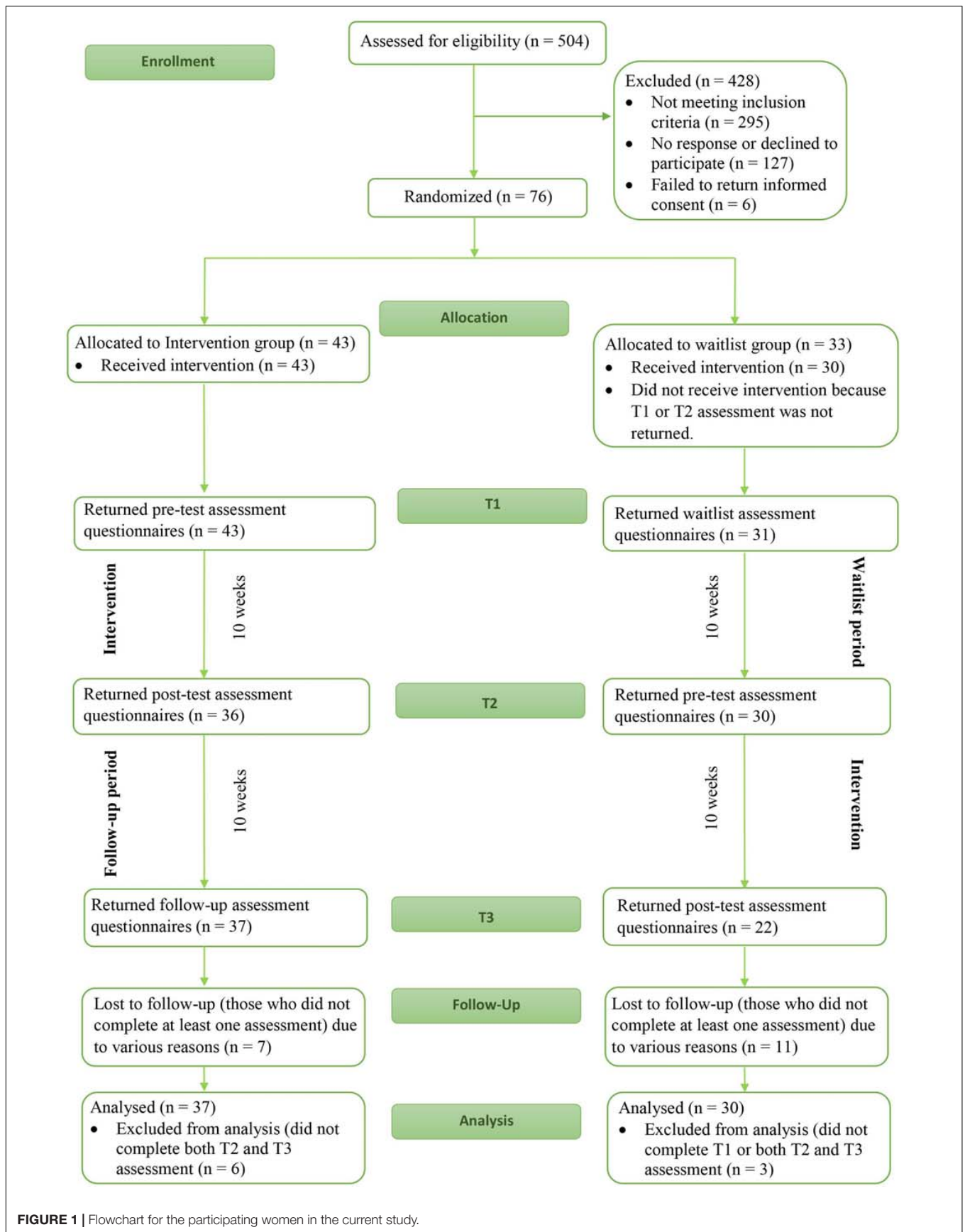


FIGURE 1 | Flowchart for the participating women in the current study.

Procedure and Design

The current study is a randomized waitlist controlled trial design. The trial is registered in the Dutch Trial Register (NTR7401) and was approved of by the Ethics Committee of the University of Amsterdam. Written informed consent was obtained from all participants included in the study. Participants were randomized before completing T1, but were only informed about the group they were allocated to after completing T1. For the intervention group, T1 served as a pretest assessment, while T1 served as a waitlist assessment for the waitlist group. This was followed by an immediate intervention period for the intervention group, and a waitlist period for the waitlist group. The intervention group participants were given 10 weeks to complete the 8-week intervention, taking into consideration that certain circumstances could result in extra time being needed (e.g., vacation or sickness) and therefore allowing for participants to complete the intervention. The waitlist period for the waitlist control group also lasted 10 weeks. This 10-week period was followed by T2: posttest assessment for the intervention group and pretest assessments for the waitlist control group. This was followed by another 10-week period. These 10 weeks served as a follow-up period for the intervention group, but also as the intervention period for the waitlist group. The last assessment for both groups was T3: follow-up assessment for the intervention group and posttest assessment for the waitlist group (see **Figure 1**).

Assessments consisted of questionnaires about maternal functioning that were completed online by participating mothers, and questionnaires on child functioning that were completed online by both the participating mothers and the non-participating parents (which was another mother in one case, and the father in all other cases). The post-test assessment (which was T2 for the intervention group and T3 for the waitlist group) also included questions about the number of sessions completed, and time spent meditating.

Intervention

The online mindful parenting training for mothers with toddlers is based on the Mindful Parenting training developed by Bögels and Restifo (2013) and the Mindful with your toddler training (Potharst et al., in press b). Modifications were made to cater to the online format as well as to age specific themes. The training was developed by a mindful parenting specialist (EP) and an online-intervention specialist (VS). All participants created a password-protected personal account on the intervention website¹. The training consists of 8 weekly online sessions. Each session consists of the following format: (1) a weekly theme, introduced by a mindfulness trainer in video format, (2) formal meditations (body scan, sitting meditations, walking meditation, mindful movement) (3) other exercises, such as visualization exercises, (4) information about how to deal with difficulties during practice, (5) psychoeducation about a mindful parenting theme relevant for parents with a toddler, and (6) exercises for daily home practice, including formal meditation (of about 10 to a maximum of 20 min), informal meditation and mindful parenting practice. After completing an exercise, mothers were invited to write about their experiences during the practice. During the training, parents learn to become aware of their own experience, also when interacting with their child. They are also taught to reflect on the experience and needs of the child. Parents additionally learn to recognize signals of stress in themselves, and to apply short mindfulness exercises in moments of stress. Mothers practiced self-care by being kinder to themselves. The training is fully self-directed and does not involve contact with a mindful parenting trainer or with other parents. Session length ranges from about 35 to 50 min. An outline of the mindful parenting training is displayed in **Table 1**.

¹<https://www.mindful-ouderschap.nl/>

TABLE 1 | Outline of the 8 sessions of the online mindful parenting training.

1 Automatic pilot

Exercises: Intention meditation, visualization exercise about automatic stress reaction, body scan
Psychoeducation about automatic pilot and mindful parenting, and seven attitudinal foundations

2 Beginner's mind

Exercises: Sitting meditation with attention to breathing, visualization exercise about the way one tends to relate and react to oneself
Psychoeducation about beginner's mind, breathing

3 At home in your body

Exercises: Mindful movement, 3-min breathing space
Psychoeducation about the body, and supporting the autonomy of a child

4 Responsive versus reactive parenting

Exercises: Sitting meditation with attention breathing and the body, and visualization exercise on the use of the 3-min breathing space in stressful parenting situations
Psychoeducation about responsive versus reactive parenting

5 Self-compassion

Exercises: Sitting meditation with attention for sounds and thoughts, reflection exercise about avoidance, self-compassion meditation
Psychoeducation about self-compassion

6 Conflict and repair

Exercises: Walking meditation, visualization exercise on conflict and repair with the child
Psychoeducation about conflict and repair and stress and perspective taking

7 Boundaries and taking care of yourself

Exercises: Sitting meditation with open attention, visualization exercise on boundaries, exercise on own needs
Psychoeducation about boundaries and taking care of the self

8 Mindful parenting – day by day

Exercises: mountain meditation, visualization exercise about looking back and looking ahead, making of a meditation plan.
Psychoeducation about continuing with mindful parenting after the training

Measures

Primary Outcome Measure: Parental Stress

Parental stress experienced by the participating women was measured using the Parental Stress Questionnaire (in Dutch: Opvoedingsbelastingvragenlijst) (PSQ, Vermulst et al., 2012), which is based on the Parenting Stress Index (Abidin, 1983). This questionnaire for parents of children aged 0 to 18, consists of 34 items that are rated on a scale from 1 to 4 (1, not true; 2, somewhat true; 3, quite true; 4, very true). The PSQ has 5 subscales: (1) *parent-child relationship problems*, (2) *parenting problems*, (3) *parental role restriction*, (4) *depressive mood*, and (5) *physical health problems*. This study used only the first three subscales, which are related to parenting. Examples of items of the first three subscales are, respectively: (1) “My child is a source of enjoyment,” (2) “I am in charge when I am with my child,” and (3) “I have less contact with friends than I used to because of my child.” In order to interpret the level of parental stress experienced, subscale scores were converted into T-scores conform the norms of the child’s age (e.g., 0 to 3 years). The PSQ and its subscales have good reliability and validity (Vermulst et al., 2012; Veerman et al., 2014). The Cronbach’s alpha in the current study were: 0.84 for parent-child relationship problems, 0.85 for parenting problems and 0.82 for parental role restriction.

Secondary Outcome Measures: Maternal Functioning *Over-reactive parenting discipline*

Mothers were asked to complete the 10-item overreactivity subscale of the Parenting Scale (Arnold et al., 1993). The concept of this subscale refers to a parenting discipline that is harsh and authoritative. For each item, participants are provided with two opposite statements and are asked to indicate how they react to specific situations regarding their child, on a spectrum scaled 1 to 7. For example, “when there is a problem with my child,” one end of the spectrum is: “things build up and I do things I do not mean to do,” and the other: “things do not get out of hand.” Total scores range from 10 to 70, with higher total scores indicating a more inadequate parenting discipline. The parenting scale has adequate reliability and validity (Arnold et al., 1993). The Cronbach’s alpha for the overreactivity subscale in the current study was 0.81.

Mindful parenting

The Dutch 10-item (original) version of the Interpersonal Mindfulness in Parenting Scale (IM-P; Duncan, 2007; De Bruin et al., 2014) was used to measure mindful parenting. The Cronbach’s alpha for this scale in the current study was 0.49. Considering the weak internal consistency, we did not analyze the IM-P in the current study.

Self-compassion

The 3-item version of the Self-Compassion Scale was administered to assess self-compassion (SCS-3, Raes and Neff, unpublished manuscript). The SCS-3 is derived from the Self-Compassion Scale and its short-form (SCS (-SF), Neff K. D., 2003; Raes et al., 2011). The three items of this scale are: “I try to see my failings as part of the human condition,” “When I am feeling down I tend to obsess and fixate on everything that is wrong” (reverse coded), and “I am intolerant and

impatient toward those aspects of my personality I do not like” (reverse coded). These items represent three domains of the self-compassion scale, namely *common humanity*, *mindfulness*, and *self-kindness*. On a scale of 1 to 5 (1, almost never; 5, almost always), participants were asked to express how frequently they acted as specified in the given statement. The range of the total score is 3 to 15, with higher scores indicating greater levels of self-compassion. The Cronbach’s alpha for this scale in the current study was 0.81.

Symptoms of depression and anxiety

To assess symptoms of depression and anxiety, a short screening tool was used: the Patient Health Questionnaire-4 (PHQ-4, Kroenke et al., 2009). The PHQ-4 is a four-item scale that was formed by merging the General Anxiety Disorder-2 (GAD-2, Kroenke et al., 2007) and the Patient Health Questionnaire-2 (PHQ-2, Kroenke et al., 2003). For each item, women were asked to indicate how frequently they had faced the described statement over the past 2 weeks on a 4-point Likert scale (0, not at all; 1, several days; 2, more than half the days; and 3, nearly every day). Total scores range from 0 to 12, with higher score indicating more symptomatology. Examples of items are: “feeling nervous, anxious or on edge” and “little interest or pleasure in doing things.” The PHQ-4 is a reliable and valid instrument (Kroenke et al., 2009; Löwe et al., 2010). The Cronbach’s alpha for the total PHQ-4 score in the current study was 0.80.

Secondary Outcome Measures: Child Behavior

Child aggressive behavior and emotional reactivity

Both the participating mothers as well as the non-participating parent evaluated problem behavior of their toddler. Two subscales of the Dutch Child Behavior Checklist for children aged 1½ to 5 (CBCL 1½ – 5, Achenbach and Rescorla, 2000) were completed: (1) *Aggressive Behavior* and (2) *Emotionally Reactive*. For each item, both parents specified to which extent it is applicable to how the child has been in the past 2 months. Items are rated on a scale of 0 to 2 (0, not at all; 1, sometimes; 2, often). Total scores were calculated for each subscale and were converted into T-scores. Examples of items for each subscale, respectively, are: (1) “punishment does not change his/her behavior” and (2) “shows panic for no good reason.” In the current study, the Cronbach’s alpha for each subscale of the CBCL completed by mother was 0.88 and 0.70, respectively, and for the non-participating parent the Cronbach’s alpha for each subscale was 0.80 and 0.78, respectively.

Data Analyses

All primary and secondary outcome measures were normally distributed at T1, where skewness and kurtosis were between -1 and +1 (George and Mallery, 2014). The intervention and waitlist group were compared regarding sociodemographic variables, using independent *t*-tests and chi-square tests. Baseline differences between the groups on all outcomes (T1) were analyzed using independent *t*-tests. If differences between the groups in baseline maternal functioning were found, these differences were controlled for in subsequent analyses of mother-rated outcome measures.

Intervention group changes over time and differences in changes over time between the intervention and waitlist group on all outcome measures were analyzed using multilevel regression models (mixed models). The structure of the multilevel models consisted of repeated measurements of time (fixed effects, level 1), nested in participants (level 2). Measurements were dummy coded with T1 scores as reference. Besides measurement occasions, the variables group [intervention (used as a reference) or waitlist] and PHQ-score at T1 (control variable) were added. Data were analyzed to assess whether change before and after the intervention was different than change before and after a waitlist period. To test whether this difference was present, we added interaction variable group*T2 to the models. The interaction variable group*T3 was added to test whether change between T1 and T3 was the same for both groups, as at T3, the waitlist group had also received the intervention. Scores on all outcomes were standardized across assessments, so that estimates of regression coefficients for dichotomous explanatory variables (measurement occasion, group, interaction between measurement occasion and group) can be interpreted similarly to Cohen's *d* effect sizes (0.2 small, 0.5 medium, 0.8 large; Cohen, 1988), and estimates of regression coefficients for continuous explanatory variables (PHQ score at T1) can be interpreted similarly to Pearson *r* effect sizes (0.1 small, 0.3 medium, 0.5 large; Cohen, 1988). The intercept was a random effect in all models. For multilevel analyses all cases are included, including those with missing data (Bagiella et al., 2000). Therefore, all participants that completed T1 and at least one more measurement (T2 and/or T3) were included in the analyses. Data analysis was performed according to the intention to treat analysis design. Because one-sided tests were used, results were considered significant if $p < 0.10$. For the primary outcome measures and for secondary outcome measures that showed significant within- or between-group differences, figures were made to give more insight into the direction of the differences.

Dose-response relationship was additionally assessed. It was checked whether the number of sessions completed and the number of minutes spent meditating per week were associated with the degree to which improvement between pretest and posttest was reported. This was assessed for all outcome measures that showed significant within- and/or between-group differences. The number of sessions and the number of minutes spent meditating per week were not normally distributed. Therefore, Spearman correlations were used. Improvement between pretest and posttest was calculated by subtracting posttest scores from pretest scores (T1 minus T2 scores for the intervention group, and T2 minus T3 scores for the waitlist group).

RESULTS

Response Rate and Adherence to Intervention

Of the 43 mothers that were randomized to the intervention group, 43 (100%) completed T1, 36 (84%) completed T2, and 37 (86%) completed T3. Of the 33 mothers that were randomized to the waitlist control group, 31 (94%) completed T1, 30 (91%)

completed T2, and 22 (67%) completed T3. Of the intervention group, six participants (14%) were excluded because of missing both the T2 and T3 measurement. Of the waitlist group, three (9%) participants were excluded because of missing all three measurements or missing both the T2 and T3 measurement. A total of 37 and 30 mothers were included in the analyses for the intervention and waitlist control group, respectively (See **Figure 1**). During the 10 weeks between pre- and posttest, participants in the intervention group completed an average of 3.8 sessions of the intervention (SD = 2.59, range 1–8 sessions), and participants in the waitlist control group an average of 3.8 sessions (SD = 2.60, range 1–8 sessions). Of the women who completed posttest assessment, five (13.9%) women in the intervention group (T2) and 4 (18.2%) women in the waitlist group (T3) completed the entire training. Apart from following the sessions, participants were invited to practice formal meditation daily. Average time spent on meditating was 14.94 min per week in the intervention group (SD = 26.30, range 0–120 min), and 18.68 min per week in the waitlist control group (SD = 30.33, range 0–120 min). No significant difference in adherence to the sessions and the practice of formal meditation between the groups occurred.

Differences Between the Groups at Baseline

The demographic characteristics of the participants are displayed in **Table 2**. No significant differences in demographic characteristics were found between the intervention and waitlist group. Mean scores (SD) on all primary outcome measures, secondary outcome measures: maternal wellbeing and secondary outcome measures: child behavior at T1, T2 and T3 (pretest, posttest and follow-up assessment for the intervention group and waitlist, pretest and posttest assessment for the waitlist group) are displayed in **Tables 3–5**, respectively. It was checked whether the intervention group differed from the waitlist group on any of the outcome measures at T1; this was the case for symptoms of depression and anxiety (PHQ-4). The intervention group reporting significantly more symptoms of depression and anxiety than the waitlist control group [$n = 67$, $t(65) = 2.28$, $p = 0.026$, 95% CI (0.18, 2.73), $d = 0.57$]. Therefore, it was decided to control for symptoms of depression and anxiety in subsequent analyses of mother-rated outcome measures.

Intervention Effects on Outcome Measures

Results of multilevel models of treatment outcome predicted by measurement occasion are shown in **Table 6** for the primary outcome measure parental stress, in **Table 7** for secondary outcome measures regarding maternal functioning, and in **Table 8** for secondary outcome measures regarding child behavior.

Primary Outcome Measure: Parental Stress

Interaction between group and T2 was non-significant for all three subscales of the PSQ, showing that there was no difference in improvement between intervention and waitlist

TABLE 2 | Demographic characteristics of the participating mothers (*n* = 67).

	Intervention group (<i>n</i> = 37)				Waitlist group (<i>n</i> = 30)				<i>t</i>	χ^2
	N	%	Mean (SD)	Range	N	%	Mean (SD)	Range		
Demographics										
Age			35.8 (3.6)	26–45			36.7 (4.2)	30–45	−0.89	
Level of education										1.62
Low	2	5.4			0	0				
Medium	6	16.2			5	17.2				
High	29	78.4			24	82.8				
Paid job	31	83.8			27	90.0				0.55
Living with partner	37	100			29	96.7				1.25
Child characteristics										
Age			3.5 (0.23)	3.1–4.2			3.5 (0.31)	3.2–4.7	−0.39	
Gender										0.17
Girl	21	58.3			16	53.3				
Boy	15	41.7			14	46.7				
Number of children in household										4.15
One	7	18.9			3	10.0				
Two	18	48.6			21	70.0				
Three	7	18.9			5	16.7				
Four or more	5	13.5			1	3.3				

SD, standard deviation; *level of education*; low, primary education or secondary pre-vocational education; medium, secondary education or vocational education; high, Bachelor or Master's degree. **p* < 0.05.

(see **Figures 2A–C**). Regarding within-group effects: a significant delayed effect (at T3, follow-up) at a 95% level was found on subscale parental role restriction for the intervention group (small effect size) (see **Table 6**).

Secondary Outcome Measures: Maternal Functioning

Regarding over-reactive parenting discipline, a significant interaction (95% level) between group and T2 showed that

effects of intervention and waitlist differed, in favor of the intervention group (see **Figure 2D**). The absence of a significant interaction between group and T3 showed that after the waitlist group had also received the intervention (posttest), their improvement in over-reactive parenting discipline was similar to the improvement of the intervention group at follow-up.

TABLE 3 | Mean and standard deviations for the primary outcome measure regarding parental stress at each measurement point.

	Intervention group		Waitlist group	
	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>
Primary outcome measure: Parental stress (PSQ)				
- Parent-child relationship problems				
Waitlist	–	–	30	10.1 (2.6)
Pretest	37	10.5 (2.3)	30	10.0 (2.8)
Posttest	36	10.8 (2.6)	22	9.6 (2.1)
Follow-up	37	10.2 (2.7)	–	–
- Parenting problems				
Waitlist	–	–	30	14.2 (2.9)
Pretest	37	15.1 (3.2)	30	14.2 (3.3)
Posttest	36	14.5 (2.8)	22	13.5 (2.5)
Follow-up	37	14.7 (3.5)	–	–
- Parental role restriction				
Waitlist	–	–	30	13.6 (3.5)
Pretest	37	12.5 (2.6)	30	13.2 (4.0)
Posttest	36	12.6 (3.0)	22	13.5 (3.6)
Follow-up	37	11.7 (2.5)	–	–

M, mean; *SD*, standard deviation; *PSQ*, parental stress questionnaire.

TABLE 4 | Mean and standard deviations for secondary outcome measures regarding maternal functioning at each measurement point.

	Intervention group		Waitlist group	
	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>
Secondary outcome measures: Maternal functioning				
Over-reactive parenting discipline (PS)				
Waitlist	–	–	30	30.6 (8.1)
Pretest	37	31.7 (9.24)	30	31.8 (8.1)
Posttest	35	29.6 (8.20)	22	26.7 (6.1)
Follow-up	37	28.7 (7.47)	–	–
Self-compassion (SCS-3)				
Waitlist	–	–	30	11.5 (3.9)
Pretest	37	10.5 (4.15)	30	12.2 (4.2)
Posttest	36	12.7 (3.91)	22	13.1 (3.3)
Follow-up	37	12.1 (3.82)	–	–
Symptoms of depression and anxiety (PHQ-4)				
Waitlist	–	–	30	2.6 (2.2)
Pretest	37	4.05 (2.85)	30	3.3 (3.1)
Posttest	36	3.11 (3.18)	22	2.5 (2.1)
Follow-up	37	2.43 (2.59)	–	–

M, mean; *SD*, standard deviation; *PS*, parenting scale; *SCS-3*, 3-item self-compassion scale; *PHQ-4*, Patient Health Questionnaire – 4.

TABLE 5 | Mean and standard deviations for secondary outcome measures regarding child behavior at each measurement point.

	Intervention group		Waitlist group	
	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>
Secondary outcome measure: Child behavior (CBCL)				
- Child aggressive behavior assessed by the participating mother				
Waitlist	–	–	30	14.5 (5.9)
Pretest	37	16.0 (7.2)	30	14.3 (6.2)
Posttest	36	13.6 (5.9)	22	13.5 (6.4)
Follow-up	37	13.5 (6.7)	–	–
- Child emotional reactivity assessed by the participating mother				
Waitlist	–	–	30	4.77 (2.7)
Pretest	37	5.03 (3.0)	30	5.23 (3.5)
Posttest	36	4.31 (2.8)	22	4.73 (2.9)
Follow-up	37	4.46 (3.5)	–	–
- Child aggressive behavior assessed by the non-participating parent				
Waitlist	–	–	23	15.2 (4.6)
Pretest	37	14.3 (5.4)	23	14.2 (5.3)
Posttest	34	14.6 (6.4)	22	13.6 (6.0)
Follow-up	28	13.7 (6.5)	–	–
- Child emotional reactivity assessed by the non-participating parent				
Waitlist	–	–	23	4.61 (2.3)
Pretest	36	5.64 (3.4)	24	4.08 (2.9)
Posttest	34	6.00 (3.5)	22	4.18 (2.5)
Follow-up	28	5.75 (3.7)	–	–

M, mean; *SD*, standard deviation; *CBCL*, child behavior checklist.

Looking at within-group differences for the intervention group, a significant improvement (95% level) in over-reactive parenting discipline was found at both T2 (posttest) and T3 (follow-up, small effect sizes) (see **Table 7**).

With regard to self-compassion, the interaction between group and T2 was significant at a 90% level, showing that the effect of intervention was larger than the effect of waitlist (small effect size, see **Figure 3A**). The absence of a significant interaction between group and T3 showed that after the waitlist group had also received the intervention (posttest), their improvement in self-compassion was similar to the improvement of the intervention group at follow-up. Looking at within-group differences for the intervention group, an improvement, significant at 95% level, in self-compassion was found at both T2 (posttest, medium effect size) and T3 (follow-up, small effect size) (see **Table 7**).

For symptoms of depression and anxiety, an interaction between group and T2, that was significant at 95% level, also showed differential effects of intervention and waitlist in favor of the intervention group (medium effect size, see **Figure 3B**). Interaction between group and T3 was also significant (95% level), showing that improvement of the intervention group was of larger effect size at follow-up, than it was for the waitlist group after they had received the intervention (medium effect size). For the intervention group, significant within-group improvements (95% level) in symptoms of depression and anxiety were shown at T2 (posttest,

small effect size) and T3 (follow-up, medium effect size) (see **Table 7**).

Secondary Outcome Measures: Child Behavior

Child behavior was rated by both parents. The interaction between group and T2 was significant at a 90% level in multilevel models predicting both mother-rated child aggressive behavior and child emotional reactivity, showing that there was a difference in effect for the intervention and waitlist control group (small effect sizes, see **Figures 3C,D**). The absence of a significant interaction between group and T3 for mother-rated child aggressive behavior and emotional reactivity showed that after the waitlist group had also received the intervention (posttest), the improvement in mother-reported child behavior was similar to the improvement of the intervention group at follow-up. Looking at within-group change, improvement at both T2 (posttest) and T3 (follow-up, small effect sizes) was found for child aggressive behavior, but not for child emotional reactivity (see **Table 8**).

For child aggressive behavior and emotional reactivity as assessed by the non-participating parent, no significant interactions between group and measurement occasion were found, as well as no significant within-group effects (see **Table 8**).

Dose-Response Relationship

Spearman correlations were calculated to study the dose-response relationship. A higher number of completed sessions was significantly associated with greater improvement on three outcome measures, namely parental role restriction ($r_s = 0.26$, $p = 0.047$), self-compassion ($r_s = -0.43$, $p = 0.001$), and symptoms of depression and anxiety ($r_s = 0.26$, $p = 0.053$). The number of minutes spent meditating was not associated with improvement on any of the outcome measures.

DISCUSSION

This study evaluated the effectiveness of an 8-week online mindful parenting training for mothers with young children who experience parental stress. A randomized controlled study design was utilized, with an intervention and a waitlist control group. The intervention group received the intervention during the first 10 weeks of the study, while the waitlist control group received the intervention during the second 10 weeks of the study. The online mindful parenting intervention was shown to be more effective than a waitlist period with regard to symptoms of depression and anxiety (medium effect size difference between the groups), over-reactive parenting discipline, self-compassion, and child emotional reactivity (small effect size difference). A significant within-group effect was found for the primary outcome: parental stress, with regard to the parental role restriction subscale. The intervention group showed a delayed improvement (small effect size) on this subscale. A within-group difference (small effect size) was also found for child aggressive behavior at both post-test and follow-up for the intervention

TABLE 6 | Primary outcome measure (parental stress): Standardized parameter estimates (and standard errors), *t* and *p* values, and 95% confidence intervals of multilevel models of intervention outcome predicted by measurement point (T2 and T3, deviations from T1), group [intervention (reference) and waitlist control group], control variable (PHQ-4 score at T1), and interaction variables (group by T2 and T3).

	Intercept	T2	T3	Group	PHQ-4 at T1	Interaction	
						Group x T2	Group x T3
Primary outcome measure: Parental stress (PSQ)							
- Parent-child relationship problems							
<i>β</i> (SE)	-0.16 (0.23)	0.15 (0.15)	-0.13 (0.12)	-0.06 (0.24)	0.07 (0.04)	-0.20 (0.22)	0.01 (0.19)
<i>t</i>	-0.72	1.03	-1.09	-0.23	1.64	-0.94	0.07
<i>p</i>	0.476	0.305	0.280	0.816	0.106	0.352	0.946
95% CI	(-0.61, 0.29)	(-0.14, 0.44)	(-0.36, 0.11)	(-0.53, 0.42)	(-0.01, 0.15)	(-0.64, 0.23)	(-0.36, 0.38)
- Parenting problems							
<i>β</i> (SE)	0.15 (0.24)	-0.14 (0.11)	-0.12 (0.13)	-0.27 (0.25)	0.01 (0.04)	0.14 (0.17)	-0.03 (0.20)
<i>t</i>	0.64	-1.23	-0.99	-1.06	0.32	0.83	-0.14
<i>p</i>	0.524	0.222	0.327	0.291	0.747	0.410	0.887
95% CI	(-0.32, 0.63)	(-0.36, 0.09)	(-0.37, 0.13)	(-0.77, 0.23)	(-0.07, 0.10)	(-0.19, 0.47)	(-0.43, 0.37)
- Parental role restriction							
<i>β</i> (SE)	-0.72 (0.21)	0.02 (0.11)	-0.24 (0.11)	0.59 (0.22)	0.15 (0.04)	-0.16 (0.16)	0.02 (0.17)
<i>t</i>	-3.45**	0.21	-2.21*	2.71**	4.13***	-1.00	0.13
<i>p</i>	0.001	0.837	0.031	0.009	<0.001	0.321	0.895
95% CI	(-1.13, -0.30)	(-0.19, 0.24)	(-0.45, -0.02)	(0.16, 1.03)	(-0.08, 0.23)	(-0.47, 0.16)	(-0.32, 0.37)

[†]*p* < 0.10, **p* < 0.05, ***p* < 0.01, ****p* < 0.001, SE, standard error; *β*, Standardized parameter estimate can be interpreted similar to Cohen's *d* in case of dichotomous variables, and as Pearson *r* in case of continuous variables; CI, confidence interval; PSQ, parenting stress questionnaire; PHQ-4, Patient Health Questionnaire - 4.

TABLE 7 | Secondary outcome measures (maternal functioning): Standardized parameter estimates (and standard errors), *t* and *p* values, and 95% confidence intervals of multilevel models of intervention outcome predicted by measurement point (T2 and T3, deviations from T1), group [intervention (reference) and waitlist control group], control variable (PHQ-4 score at T1), and interaction variables (group by T2 and T3).

	Intercept	T2	T3	Group	PHQ-4 at T1	Interaction	
						Group x T2	Group x T3
Secondary outcome measures: Maternal functioning							
Over-reactive parenting discipline (PS)							
<i>β</i> (SE)	-0.05 (0.24)	-0.26 (0.11)	-0.37 (0.11)	-0.05 (0.26)	0.06 (0.04)	0.41 (0.17)	0.02 (0.18)
<i>t</i>	-0.20	-2.28*	-3.28**	-0.17	1.57	2.45*	0.85
<i>p</i>	0.845	0.026	0.002	0.862	0.123	0.017	0.932
95% CI	(-0.52, 0.42)	(-0.49, -0.03)	(-0.59, -0.14)	(-0.57, 0.48)	(-0.02, 0.14)	(0.08, 0.75)	(-0.34, 0.37)
Self-compassion (SCS-3)							
<i>β</i> (SE)	0.41 (0.20)	0.57 (0.14)	0.40 (0.14)	-0.01 (0.22)	-0.19 (0.03)	-0.40 (0.20)	0.08 (0.21)
<i>t</i>	2.03*	4.20***	2.99**	-0.06	-5.53***	-1.95 [†]	0.40
<i>p</i>	0.046	<0.001	0.004	0.953	<0.001	0.056	0.695
95% CI	(0.01, 0.81)	(0.30, 0.85)	(0.13, 0.68)	(-0.46, 0.43)	(-0.26, -0.12)	(-0.80, 0.01)	(-0.34, 0.50)
Symptoms of depression and anxiety (PHQ-4)							
<i>β</i> (SE)	0.38 (0.15)	-0.36 (0.16)	-0.58 (0.15)	-0.52 (0.23)	-	0.59 (0.24)	0.50 (0.24)
<i>t</i>	2.50*	-2.24*	-3.82***	-2.32*	-	2.53*	2.05*
<i>p</i>	0.015	0.028	<0.001	0.024	-	0.014	0.044
95% CI	(0.08, 0.68)	(-0.67, -0.04)	(-0.89, -0.28)	(-0.97, -0.07)	-	(0.13, 1.06)	(0.01, 0.98)

[†]*p* < 0.10, **p* < 0.05, ***p* < 0.01, ****p* < 0.001; SE, standard error; *β*, Standardized parameter estimate can be interpreted similar to Cohen's *d* in case of dichotomous variables, and as Pearson *r* in case of continuous variables; CI, confidence interval; PS, Parenting Scale; SCS-3, 3-item self-compassion scale; PHQ-4, Patient Health Questionnaire - 4.

group. No significant improvement was found on child outcomes for the non-participating parent.

With regard to the primary outcome measure parental stress, a delayed effect was found in the intervention group on the domain of parental role restriction, that is, only at

follow-up (within-group effect of small effect size). During the toddler period, the child is dependent on parental presence and co-regulation, which mothers may experience as a constraint on their personal life with respect to activities that they enjoy for themselves. Possibly, by doing the training and reflecting

TABLE 8 | Secondary outcome measures (child behavior): Standardized parameter estimates (and standard errors), *t* and *p* values, and 95% confidence intervals of multilevel models of intervention outcome predicted by measurement point (T2 and T3, deviations from T1), group [intervention (reference) and waitlist control group], control variable (PHQ-4 score at T1), and interaction variables (group by T2 and T3).

	Intercept	T2	T3	Group	PHQ-4 at T1	Interaction	
						Group x T2	Group x T3
Secondary outcome measure: Child behavior (CBCL)							
- Child aggressive behavior assessed by the participating mother							
<i>β</i> (SE)	0.40 (0.24)	-0.33 (0.11)	-0.38 (0.11)	-0.28 (0.26)	-0.04 (0.04)	0.29 (0.17)	0.30 (0.18)
<i>t</i>	1.68 [†]	-2.90**	-3.34**	-1.08	-0.86	1.74 [†]	1.63
<i>p</i>	0.097	0.005	0.001	0.284	0.392	0.087	0.108
95% CI	(-0.07, 0.88)	(-0.56, -0.10)	(-0.61, -0.15)	(-0.79, 0.23)	(-0.12, 0.05)	(-0.04, 0.63)	(-0.07, 0.66)
- Child emotional reactivity assessed by the participating mother							
<i>β</i> (SE)	-0.11 (0.22)	-0.20 (0.13)	-0.19 (0.13)	-0.01 (0.23)	0.05 (0.04)	0.35 (0.19)	0.25 (0.21)
<i>t</i>	-0.49	-1.61	-1.40	-0.04	1.25	1.90 [†]	1.72
<i>p</i>	0.627	0.113	0.167	0.967	0.215	0.062	0.246
95% CI	(-0.56, 0.34)	(-0.45, 0.05)	(-0.45, 0.08)	(-0.47, 0.45)	(-0.03, 0.13)	(-0.02, 0.73)	(-0.17, 0.67)
- Child aggressive behavior assessed by the non-participating parent							
<i>β</i> (SE)	0.01 (0.14)	0.07 (0.14)	-0.17 (0.14)	0.14 (0.23)	-	-0.28 (0.22)	-0.10 (0.22)
<i>t</i>	0.061	0.51	-1.22	0.60	-	-1.24	-0.43
<i>p</i>	0.951	0.613	0.229	0.552	-	0.219	0.668
95% CI	(-0.28, 0.30)	(-0.21, 0.35)	(-0.46, 0.11)	(-0.32, 0.59)	-	(-0.72, 0.17)	(-0.54, 0.35)
- Child emotional reactivity assessed by the non-participating parent							
<i>β</i> (SE)	0.14 (0.15)	0.10 (0.15)	-0.05 (0.16)	-0.33 (0.24)	-	-0.30 (0.23)	-0.09 (0.25)
<i>t</i>	0.94	0.70	-0.28	-1.36	-	-1.28	-0.35
<i>p</i>	0.350	0.490	0.778	0.179	-	0.205	0.730
95% CI	(-0.16, 0.44)	(-0.19, 0.40)	(-0.37, 0.28)	(-0.80, 0.15)	-	(-0.77, 0.17)	(-0.59, 0.42)

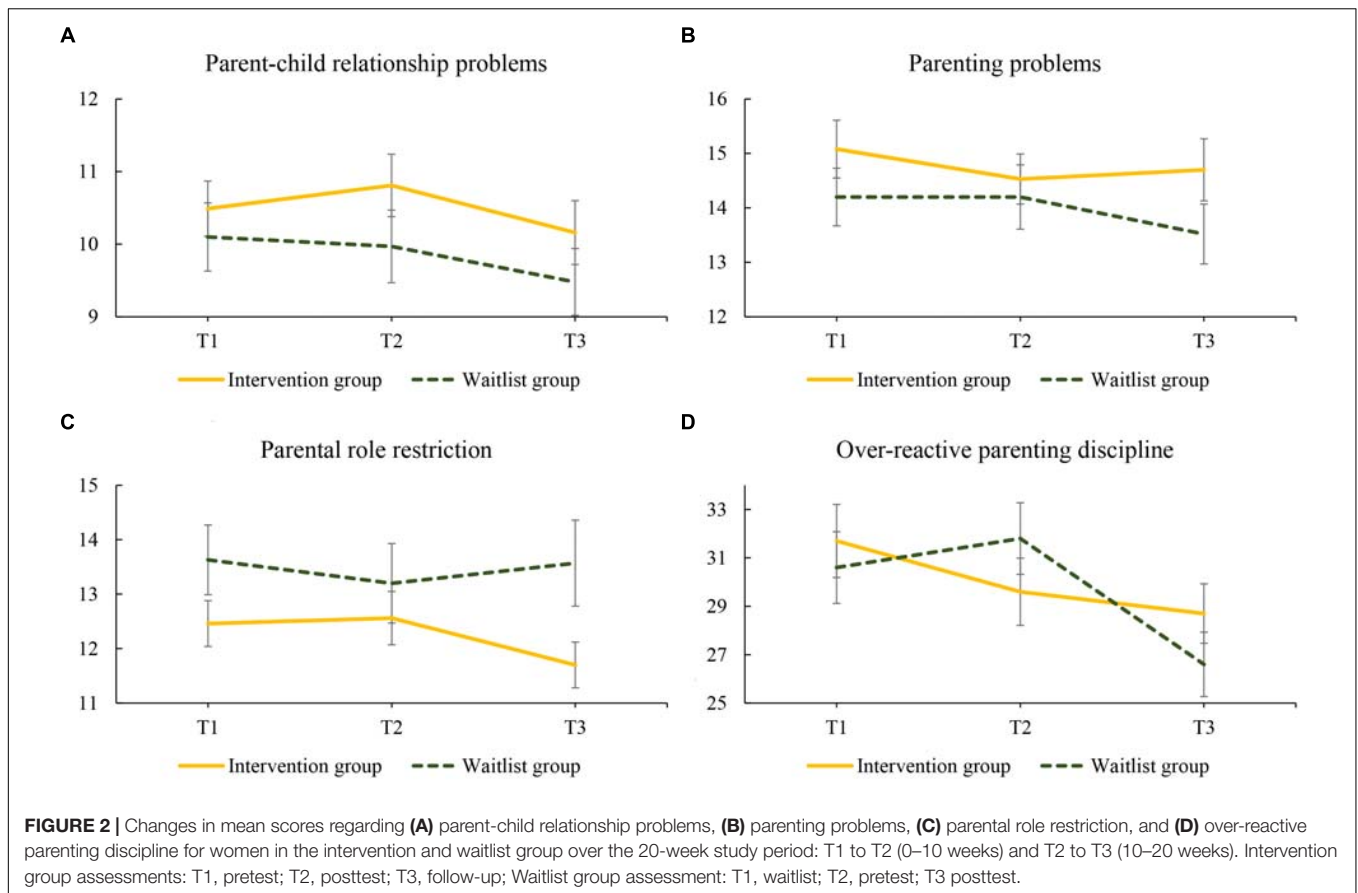
[†]*p* < 0.10, **p* < 0.05, ***p* < 0.01, ****p* < 0.001; SE, standard error; *β*, Standardized parameter estimate can be interpreted similar to Cohen's *d* in case of dichotomous variables, and as Pearson *r* in case of continuous variables; CI, confidence interval; PHQ-4, Patient Health Questionnaire - 4; CBCL, child behavior checklist.

on their own feelings, parents become more aware of their own needs. By taking the time to do the training and completing the daily exercises, they may realize that taking time for themselves is possible, which may help them to arrange activities for themselves. Alternatively, mothers may be able to accept the situation more than they did before, or they may be able to adjust their expectations. Accordingly, enjoying things for themselves, even if only for a short period of time and/or in presence of the child may seem more possible. An immediate improvement in parental role restriction was found in the waitlist group after the training. Possibly, the completion of the questionnaires twice before being able to start the training helped them prepare and profit more optimally from the training. Furthermore, the waiting period may have provided time to plan ahead and prepare for the start of the training more thoroughly.

Of the different parental stress domains, only parental role restriction improved over time, while parent-child relationship problems and parenting problems did not. Duncan et al. (2009) presented a model of mindful parenting that aimed to explain how mindful parenting could improve parenting and parent-child interactions. It is therefore surprising that especially these two domains of parental stress did not improve. Earlier studies that examined the effectiveness of mindful parenting group training have found improvements in parenting problems and the parent-child relationship (Bögels et al., 2014; Emerson et al., in press; Potharst et al., in press b). Also,

in a study comparing mindful parenting training in clinical versus non-clinical settings, in which the same questionnaire was used as the one in the current study, improvements in problems with parenting and in the parent-child relationship were reported by the parents after the training in both settings (Potharst et al., in press a).

Two important differences between the face-to-face groups versus online training are the presence of a trainer/therapist and a peer group of parents, who can both in their own way offer support and empathy. Furthermore, they could provide a sense of the universality of parental difficulties, an understanding of the parenting situation, or advice on how to apply mindfulness in specific situations. A study that compared a self-directed versus therapist-assisted telehealth intervention for parents of children with autism spectrum disorder, found that contact with a therapist via video-conferencing could be of added value in online parenting programs (Ingersoll et al., 2016). Results showed that parents in both groups improved in observed parent fidelity, self-reported self-efficacy, stress, and positive perceptions of their child, but that the therapist-assisted group improved more regarding parent fidelity and positive perceptions of the child (Ingersoll et al., 2016). A meta-analysis of online parenting programs indicated that self-directed programs were more effective with regard to parental knowledge, while programs with professional support (coaching with an earpiece) had better results in terms of parental behavior (Nieuwboer et al., 2013).



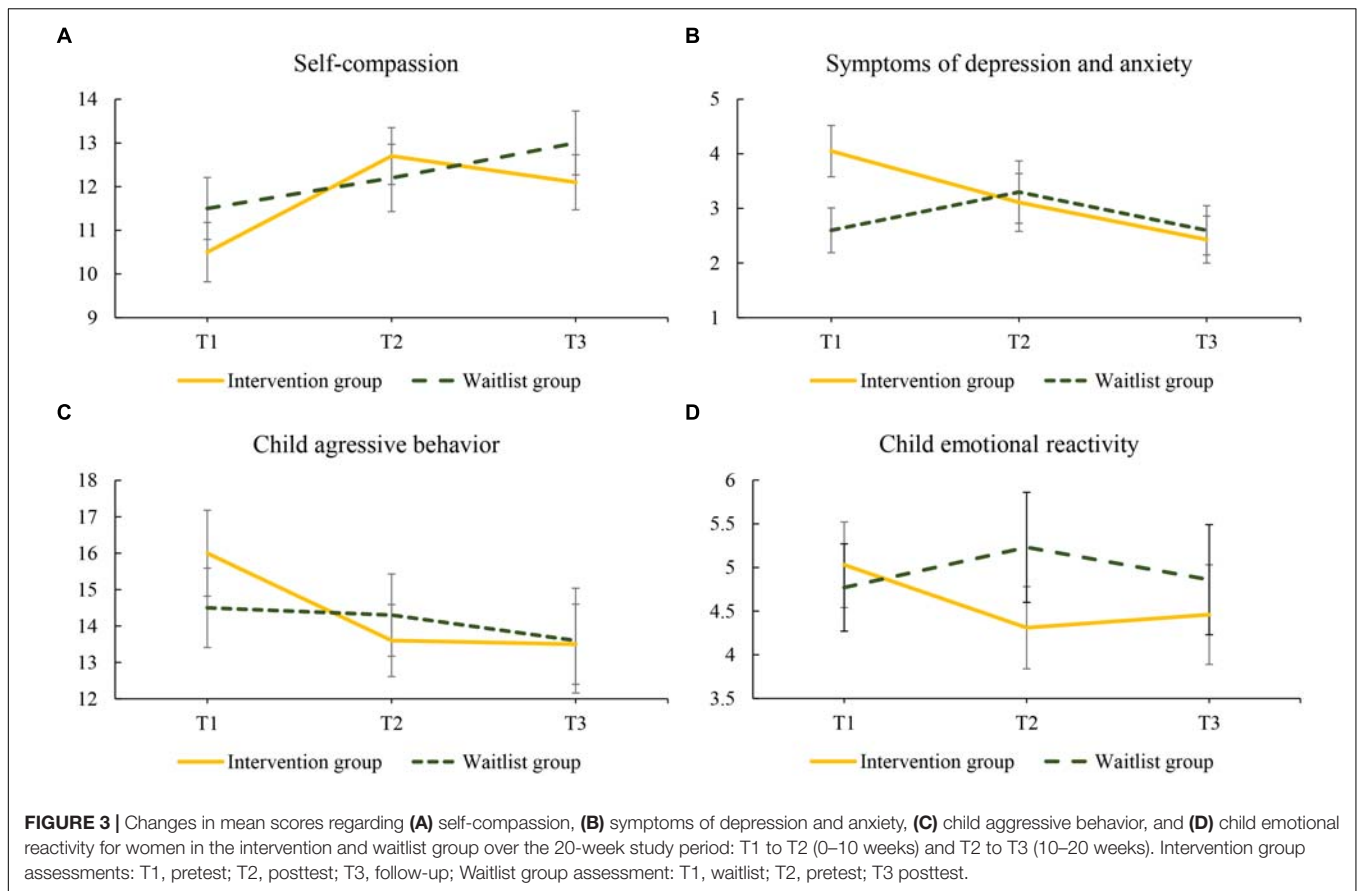
Furthermore, programs featuring both professional and peer support showed better results regarding attitudinal changes (Nieuwboer et al., 2013).

Another difference with the group training is that the online training was less intensive, contained a shorter session length, had lower adherence, and gave less support for carrying out home practice. In the current study, average time spent meditating (excluding time spent meditating during training sessions) was only 15 min per week by the intervention group, and 19 min per week by the waitlist control group in the period that they followed the training (between T2 and T3). In an aforementioned study by Potharst et al. (in press b) in which improvements in problems with parenting and in the parent-child relationship were found with the same questionnaire that was used in the current study, an average meditation time of 2 h per week was reported. The limited meditation time in the current study may also have contributed to the lack of improvement in parenting and the parent-child relationship. A final difference to be mentioned is the methodological nature of this study. The current study was one of the first to utilize a randomized control design where participants were randomly assigned to an intervention or waitlist control group, while the other studies used pre- and posttest or quasi-experimental designs. Future studies should examine whether an e-health coach or possibilities to be in touch with other parents following the training can support the online format by assisting

parents in specific problems regarding parenting or the parent child relationship.

A specific area of parenting that did improve significantly in the current study is over-reactive parenting discipline (small effect size interaction between group and T2). Possibly, this area of parenting was more susceptible to change in this online version of the mindful parenting training because it may depend more on insight rather than on the number of hours spent reflecting on experiences in meditations and inquiries, together with a group. The first session provided participants with psycho-education about automatic stress reactions (fight, flight, freeze) that also involves over-reactivity (fight). Thus, even parents that only completed the first (few) session(s), may have benefited from this psycho-education. Improvement in over-reactive parenting was indeed not associated with the number of minutes spent meditating per week, nor the number of completed sessions. Yet, the other outcome measures related to maternal functioning (for which improvement was shown) were related to the number of completed sessions.

The current study found that the online mindful parenting training yielded positive results regarding self-compassion (small effect size interaction at 90% significance level between group and T2). Mindful parenting teaches parents a certain framework that helps them relate differently, not only toward their child and the problems they experience (with their child), but also toward themselves. Mindful parenting can be used to find a



balance between taking care of the children without losing sight of one's own needs, learning how to better take care of oneself and be friendly toward oneself. An important element of self-compassion is a sense of common humanity (Neff K., 2003). Following a mindful parenting training in a group may enhance the experience of common humanity. Parents who normally feel alone in the difficulties they experience in parenthood, may feel reassured by the fact that other parents experience difficulties as well. The positive result regarding self-compassion in the current study shows that being with a group of people with similar problems is not a necessity to increase self-compassion.

Positive effects were also found for symptoms of depression and anxiety (medium effect size interaction between group and T2). A meta-analysis on the effectiveness of online mindfulness trainings also showed small but significant improvements in symptoms of depression and anxiety (Spijkerman et al., 2016). This meta-analysis found that the improvements in depression and anxiety in a population of healthy individuals were smaller in effect size compared to individuals with psychological symptoms, but these differences were not significant (Spijkerman et al., 2016). This seems to be in line with the results of the current study, where the intervention group also showed a greater improvement. The intervention group reported more symptoms of depression and anxiety than the waitlist group at baseline. At T3, after the waitlist control group had also received the intervention, improvement was still smaller than in the

intervention group. The difference between the groups at baseline may have therefore enlarged the interaction effect between group and T2. The current study confirms that especially for parents with higher levels of depression and anxiety, a mindfulness training can be beneficial, even if the specific mindfulness training is primarily focused on parenting and parental stress.

As the participating mothers report some positive personal change after participating in the training, it is also of interest whether their children additionally profit from these (self-perceived) changes. Indeed, a significant interaction between group and T2 at 90% level was found for mother-rated child aggressive behavior (small effect sizes of interaction between group and T2). Effect sizes of within-group differences between pretest, posttest and follow-up in child aggressive behavior were similar to effect sizes on child externalizing psychopathology that were reported in a study on the effectiveness of mindful parenting group trainings in youth mental health care (Meppelink et al., 2016). These results were also comparable to the effect size of improvement in child behavior that was reported in a meta-analysis on the effectiveness of online parenting trainings (Nieuwboer et al., 2013).

The improvement in mother reported child aggressive behavior can be explained in three ways: (1) there was an actual improvement in aggressive behavior of the children, (2) there was an improvement in child aggressive behavior toward the mothers, (3) a change occurred in the experienced

burden from their children's behavior, and (4) a change for the mothers in the intervention group occurred in the way they perceived their child's behavior due to the knowledge of being in the intervention group. To gain clarity on how to interpret mother-reported change in their children, partners were allowed to complete a questionnaire about their children's behavior. The partners reported no change in their children's aggressive behavior after the training. This seems to point at the second, third or fourth explanation for the change the mothers in the intervention group reported. When examining the mean scores over time, the post-test (T2) decrease in the intervention group seems to be larger than the post-test decrease (T3) in the waitlist group, which seems to point to the fourth explanation. However, child aggressive behavior scores were somewhat higher in the intervention group than in the waitlist group at baseline (T1), and were similar at T3, after both groups received the intervention. Possibly, a larger study, in which observational measures of parent-child interaction and child behavior are included, and in which mechanisms of change are studied, could provide more insight. Specifically, it could provide more clarity regarding the interpretation of self-reported change in children's behavior after following an online mindful parenting training. However, the fact that the interpretation of the outcome on child behavior of the current study is unclear, does not imply that the outcome itself is trivial, as parental perception of child behavior can influence child development and child behavior (Bugental and Johnston, 2000).

Furthermore, regarding child emotional reactivity, a significant interaction between group and T2 at 90% level was found. High child emotional reactivity may be a result of emotion regulation problems (Cole et al., 2004; Morgan et al., 2014). The development of emotion regulatory abilities in children is dependent on child cognitive development and on child temperament, but also on parental emotion regulatory abilities (Rutherford et al., 2015). Training in mindfulness improves emotion regulation and decreases emotion regulation problems (Roemer et al., 2015). An example of this is the decrease in over-reactive parenting discipline in the current study. Therefore, online mindful parenting training may enhance the development of emotion regulatory abilities and decrease emotional reactivity in children.

Treatment fidelity was relatively low in the current study, and the variability in treatment fidelity was high. Average time spent meditating apart from the training sessions was about 15 min per week, with a range of 0 to 120 min. In an above mentioned study on a mindful parenting group training in a clinical and non-clinical setting, average meditation time was 2 h per week (Potharst et al., in press a). In other studies on online mindfulness interventions, participants also practiced more than in the current study. In a study on an online mindfulness training for employees, participants practiced on average 13 min per day or 1.5 h per week (Aikens et al., 2014). In two studies on preventative online mindfulness trainings, participants practiced on average 4 times a week for about 20 min (Morledge et al., 2013; Mak et al., 2015). In one of these studies, a weak but statistically significant correlation was found between the amount of practice and improvement on stress and mindfulness (Morledge et al.,

2013). Possibly, the average amount of practice in the current study was too low to show such an association. The association between mindfulness practice and training outcome is, however, complex. In a randomized controlled trial on the effectiveness of mindfulness-based cognitive therapy (MBCT) group training for patients with recurrent depression, it was found that in general MBCT was not more effective in preventing a relapse than cognitive psychological education similar to what is taught in MBCT (Williams et al., 2014). Only for patients who scored above the median on level of childhood trauma, MBCT was shown to be more effective than psychoeducation without practice in mindfulness meditation (Williams et al., 2014).

Only 15.5% of the participants completed the training, and on average about four sessions were completed. In a meta-analysis on the effectiveness of online mindfulness interventions, five studies that reported the percentage of participants who completed the intervention were included, and these percentages ranged from about 40 to 90% (Spijkerman et al., 2016). In the study on a mindful parenting group training in a clinical and non-clinical setting adherence to the training was around 85% (Potharst et al., in press a). However, adherence to the training is not defined as completing all sessions in group trainings, as it is considered normal that participants miss one or a few sessions due to illness or vacation for example. The question is whether the online mindful parenting training in the current form is feasible for parents with parental stress. Possibly, the workload (e.g., daily homework, formal and informal meditation practice and mindful parenting practice) is too high for participants with a family with young children who already experience elevated levels of stress, given the lack of support or guidance by a trainer in the online format. It is, however, also possible that participants did not feel a need to follow more sessions than they did. This may have been the case for women who wanted to learn to be less over-reactive in their parenting, because over-reactive parenting discipline decreased significantly during the training, regardless of the number of sessions completed. Possibly, a shorter training fits better with the online format. In two studies, positive effects were reported of short (two session and/or 2 week trainings) on stress and symptoms of anxiety and depression (Glück and Maercker, 2011; Cavanagh et al., 2013). It is important to further study the feasibility and acceptability of the online mindful parenting training, and also focus on the facilitators and barriers for following the training.

The current study had both strengths and limitations. A major strength of the study was the utilization of a randomized design, and the fact that both the participating mothers and their partners participated in the study. One limitation is that at baseline, the intervention group reported more symptoms of depression and anxiety compared to the waitlist control group. This difference could not be explained by bias caused by participant's knowledge of which group they were allocated to, as they were randomized after the completion of T1. It can also not be due to a greater drop-out rate by mothers with more symptoms of depression and anxiety in the waitlist group, which could have explained that they were in need of a short-term intervention or support. Of the three women that dropped out of the waitlist group, two never completed T1 and were therefore not informed

about their allocation to waitlist control group, and the third participant had a very low score (2) on the PHQ-4. This difference between groups may have influenced the results, even though the difference seems to have been caused by chance and we statistically controlled for it. Possibly, the intervention influenced the intervention group and waitlist control group differentially. For example, mothers with higher level of depression and anxiety needed to focus more on the self and internalizing symptoms, while the waitlist control group may have had more mental space to focus on the parent-child relationship. Another possibility is that practicing formal meditations in between sessions was more feasible for mothers with lower levels of depression and anxiety, which gave them the opportunity to benefit more from the training.

A second limitation was the relatively low proportion of eligible women that chose to participate, in addition to the low adherence to the intervention. This seems to suggest that an investigation on the feasibility and acceptance of the current version of the online mindful parenting training is needed, as well as an adjustment of the current training in order to improve feasibility and acceptance for mothers with elevated levels of stress. Intention-to-treat analyses, however, showed that despite the low adherence, the training had some positive effects on the participants. This brings up the question how many sessions are needed to experience positive effects. The low percentage of eligible women that chose to participate, and thus the lower than intended sample size had negative consequences for the power of the current study. In combination with the non-clinical sample that the training was offered to, and the relatively small effects that were expected because the training was offered online and without professional or peer support, this may have limited the possibility of finding significant interaction effects of group and measurement occasion on some outcome measures. A third limitation is that the mindful parenting measure showed a weak internal consistency, resulting in being removed as an outcome measure. Therefore, it is not possible to confirm that the changes were due to an increase in mindful parenting. The low reliability of the measure may have been due to the fact that we chose the original (short) version of the IM-P, that also showed weak reliability in an earlier study on the effectiveness of Mindful Parenting (Potharst et al., in press a). A fourth limitation is the sole

use of self-report measures. For a reliable measurement of parent-child interaction (that includes parental overreactivity), parent-child interaction observation is the preferred method (Miron et al., 2009).

The variability of significant results, the lack of information on the working mechanisms, and the relatively small effect size improvements that were shown in the current study call for modesty in the conclusions that are drawn. However, results do show that an online mindful parenting training seems to be effective in improving maternal symptoms of depression and anxiety, over-reactive parenting discipline, self-compassion, and mother-perceived child behavior. The current study does therefore provide first evidence that an online parenting training may be an easily accessible and valuable addition to the existing range of interventions for mothers with elevated levels of parental stress.

ETHICS STATEMENT

This trial is registered in the Dutch Trial Register (NTR7401) and was approved of by the Ethics Committee of the University of Amsterdam. All participants provided written informed consent.

AUTHOR CONTRIBUTIONS

EP contributed to the development of the training, study design, data analysis, and wrote parts of the manuscript. MB contributed to data collection, data analysis, and wrote parts of the manuscript. IC, KvB, and AJ contributed to data collection. VS, IN, and SB contributed to the development of the training and to the study design. VP is the principal investigator and acquired funding, contributed to the study design, and monitored the process of data collection and analysis. All authors contributed to the final version of the manuscript.

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Conflict of Interest Statement: SB published books about mindful parenting, and EP published a book in Dutch about mindful parenting for parents with a baby.

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The Effect of Mindfulness Interventions for Parents on Parenting Stress and Youth Psychological Outcomes: A Systematic Review and Meta-Analysis

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Background: The psychological well-being of parents and children is compromised in families characterized by greater parenting stress. As parental mindfulness is associated with lower parenting stress, a growing number of studies have investigated whether mindfulness interventions can improve outcomes for families. This systematic review and meta-analysis evaluates the effectiveness of mindfulness interventions for parents, in reducing parenting stress and improving youth psychological outcomes.

Methods: A literature search for peer-reviewed articles and dissertations was conducted in accordance with PRISMA guidelines in the PsycInfo, Medline, PubMed, CINAHL, Web of Science, Cochrane Central Register of Controlled Trials, and ProQuest Dissertations & Theses databases. Studies were included if they reported on a mindfulness-based intervention delivered in person to parents with the primary aim of reducing parenting stress or improving youth psychological outcomes.

Results: Twenty-five independent studies were included in the review. Eighteen studies used a single group design and six were randomized controlled trials. Within-groups, meta-analysis indicated a small, post-intervention reduction in parenting stress ($g = 0.34$), growing to a moderate reduction at 2 month follow-up ($g = 0.53$). Overall, there was a small improvement in youth outcomes ($g = 0.27$). Neither youth age or clinical status, nor time in mindfulness training, moderated parenting stress or overall youth outcome effects. Youth outcomes were not moderated by intervention group attendees. Change in parenting stress predicted change in youth externalizing and cognitive effects, but not internalizing effects. In controlled studies, parenting stress reduced more in mindfulness groups than control groups ($g = 0.44$). Overall, risk of bias was assessed as serious.

Conclusions: Mindfulness interventions for parents may reduce parenting stress and improve youth psychological functioning. While improvements in youth externalizing and cognitive outcomes may be explained by reductions in parenting stress, it appears that other parenting factors may contribute to improvements in youth

internalizing outcomes. Methodological weaknesses in the reviewed literature prevent firm conclusions from being drawn regarding effectiveness. Future research should address these methodological issues before mindfulness interventions for parents are recommended as an effective treatment option for parents or their children.

Keywords: mindfulness, mindful parenting, parenting intervention, parenting stress, child externalizing, child internalizing, meta-analysis, systematic review

INTRODUCTION

Parenting stress is associated with negative outcomes for parents and their children (Davis and Carter, 2008; Deater-Deckard et al., 2016). Recently, several studies have linked lower parenting stress with higher parental mindfulness (e.g., Parent et al., 2016; Campbell et al., 2017). Accordingly, a growing number of studies have delivered mindfulness-based interventions to parents, with the aim of reducing parenting stress and improving psychological outcomes for youth (e.g., Zhang et al., 2017; Jones et al., 2018). However, no quantitative synthesis of the literature on the effectiveness of such interventions is currently available. This review and meta-analysis was conducted to evaluate the effectiveness of mindfulness interventions for parents, in reducing parenting stress and improving youth psychological outcomes.

Parents who experience higher parenting stress report poorer psychological well-being (Lavee et al., 1996), more negative affect and less positive affect (Deater-Deckard et al., 2016), and lower marital quality (Robinson and Neece, 2015). In families characterized by greater parenting stress, children have more internalizing and externalizing problems (Huth-Bocks and Hughes, 2007; Davis and Carter, 2008; Robinson and Neece, 2015), poorer cognitive skills such as executive function (de Cock et al., 2017) and more social and interpersonal difficulties (Anthony et al., 2005). Greater parenting stress is also associated with negative parenting behaviors, including harsh discipline (Venta et al., 2016) and hostility (McMahon and Meins, 2012), which have been shown to contribute to poorer child and adolescent psychological outcomes (Rominov et al., 2016; Pinquart, 2017). Managing parenting stress is therefore important for the well-being of parents and their children. It has been suggested that incorporating mindfulness into the parent-child relationship may be one way of achieving this goal (Kabat-Zinn and Kabat-Zinn, 1997; Dumas, 2005; Duncan et al., 2009; Bögels et al., 2010).

In the context of contemporary Western psychology, mindfulness is typically described as a psychological process of bringing non-judgmental awareness to experiences occurring in the present moment (Kabat-Zinn, 2015). Individuals differ in their disposition for mindfulness but can develop their skills through regular practice (Kabat-Zinn, 2003, 2015; Baer et al., 2006). The application of mindfulness to parenting was first described by Kabat-Zinn and Kabat-Zinn (1997). These authors defined mindful parenting as paying non-judgmental, non-reactive attention to each moment and interaction with the child, such that the parent is aware of their child's needs in any moment.

Building on this account, Duncan et al. (2009) developed a model of mindful parenting comprising five dimensions: listening to the child with full attention, non-judgmental acceptance of self and child, emotional awareness of self and child, self-regulation in parenting, and compassion for self and child. Mindful parents reduce their use of automatic but unhelpful ways of evaluating or interacting with their child, thus making way for more positive parent-child relationships (Dumas, 2005; Duncan et al., 2009). For example, mindfulness can assist parents to break a habitual pattern of automatically reacting with anger to a child's tantrum, which is likely to elicit further negative affect from the child (Dumas, 2005).

In light of these ideas, mindfulness-based interventions such as the 8-week Mindfulness-based Stress Reduction program (MBSR; Kabat-Zinn et al., 1992), have been offered to parents who experience high levels of stress, anxiety, or depression (Bazzano et al., 2015). Other researchers have adapted the MBSR program specifically to the parenting context (Bögels et al., 2014; Eames et al., 2015). These mindful parenting programs are based upon the same principles of mindfulness as MBSR and follow a similar session structure. MBSR for parents and mindful parenting programs both aim to improve outcomes for families, particularly reducing parenting stress (for example, Neece, 2014; Chaplin et al., 2018). However, mindful parenting programs focus specifically on the stressors faced by parents and the patterns of interaction they have with their children. For example, the well known "observing a raisin" exercise is used in MBSR to illustrate the concept of stepping out of automatic pilot. In one mindful parenting course (Bögels and Restifo, 2014), this exercise is followed by a homework practice in which parents mindfully observe their child, using the skills they learnt while observing a raisin.

In the past decade, a number of studies have explored the effects of both MBSR and mindful parenting interventions on parenting stress. Following MBSR programs, reductions in parenting stress were reported by parents of pre-school aged children with Autism Spectrum Disorder (ASD) and other developmental delays (Chan and Neece, 2018). In a similar clinical sample, the reductions in parenting stress were larger for the MBSR group than a waitlist control group (Neece, 2014). Mindful parenting interventions have been offered in community, as well as in clinical settings. In two small studies of community-recruited parents, no reduction in parenting stress was found following mindful parenting training (Maloney and Altmaier, 2007; Eames et al., 2015), whilst in a larger community study, a reduction was reported (Potheart et al., 2018). The difference in sample sizes may account for the

contrasting findings in these studies. In the clinical context, parents of children and adolescents with a range of externalizing and internalizing disorders (Bögels et al., 2014; Ridderinkhof et al., 2017) reported both immediate and maintained reductions in parenting stress following mindful parenting interventions. In contrast, parents of children with Attention Deficit and Hyperactivity Disorder (ADHD) reported a moderate reduction in parenting stress only at 2 month follow-up (van der Oord et al., 2012). The majority of mindful parenting intervention studies have used a single group design. However, a small number of controlled studies have found mindful parenting groups report greater reductions in parenting stress than control groups, in community and clinical settings (Ferraioli and Harris, 2013; Lo et al., 2017a; Corthorn, 2018). In sum, although results are mixed, MBSR and mindful parenting interventions appear to be associated with reduced levels of parenting stress, both in community and clinical contexts.

Studies of MBSR and mindful parenting have also investigated outcomes for the children of parents who attended the interventions. Most studies investigated internalizing and externalizing symptoms, which are the most common psychological problems in youth (Bayer et al., 2008). A number of studies also examined cognitive and social domains of functioning, both of which are related to important longer term problems, such as poorer academic achievement (Malecki and Elliott, 2002; Daley and Birchwood, 2010). Following their parents' attendance at MBSR, pre-school aged children with ASD and other developmental delays showed significant improvements in cognitive, externalizing, and social outcomes (Neece, 2014; Lewallen and Neece, 2015). Following mindful parenting training, small to moderate reductions in youth internalizing problems have been reported by youth with a range of mental health problems and their parents (Bögels et al., 2014; Haydicky et al., 2015; Racey et al., 2017). In contrast, in a study involving 10 adolescents with ADHD, no significant improvements in adolescent internalizing problems were reported (van de Weijer-Bergsma et al., 2012). Similarly, externalizing problems have been reported to reduce after mindful parenting interventions by parents (Bögels et al., 2014; Meppelink et al., 2016) and youth (Bögels et al., 2008; Ridderinkhof et al., 2017) in some studies, but not in others (De Bruin et al., 2015; Jones et al., 2018). In relation to cognitive outcomes, parents have reported fewer attention problems (Ridderinkhof et al., 2017), but no reductions in metacognitive (Zhang et al., 2017) or learning problems (Haydicky et al., 2015). Finally, after mindful parenting interventions, youth social outcomes improved in some studies (Bögels et al., 2008; Haydicky et al., 2015) but not others (De Bruin et al., 2015; Jones et al., 2018). The results of the literature relating to youth outcomes are therefore mixed.

Considering the number of studies and the mixed results they report, a quantitative evaluation of the available data is needed. However, there are no published meta-analyses in this field of research. Further, although two narrative reviews have been conducted, neither of these focuses exclusively on mindfulness interventions delivered to parents. Harnett and Dawe (2012) reviewed 24 interventions incorporating

mindfulness, for school students and their careers. Only two of those interventions were delivered to parents. Moreover, those two interventions were not primarily mindfulness interventions. Instead, they incorporated an element of mindfulness into existing behavioral skills programs. Townshend et al. (2016) reviewed seven randomized controlled trials (RCTs) of various interventions delivered to parents. Again, only two of the reviewed trials delivered interventions that were primarily mindfulness-based, while the others incorporated aspects of mindfulness in behavioral or emotion-coaching programs. A review focused upon mindfulness interventions for parents is therefore warranted. Accordingly, the aim of this review was to systematically and quantitatively evaluate the effectiveness of mindfulness interventions for parents. To reflect the range of outcomes covered in the existing literature, the outcomes of interest in this review were parenting stress, and youth functioning across internalizing, externalizing, cognitive, and social domains. Due to the noted similarities between mindful parenting interventions and other mindfulness-based interventions such as MBSR for parents, we amalgamated these studies into a single group and will refer to them together as "mindfulness interventions for parents."

METHODS

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement and checklist (Moher et al., 2009) were used to guide the conduct and reporting of this review.

Eligibility Criteria

Studies were eligible for inclusion in the review if they reported on a mindfulness-based intervention delivered in person to parents, with a primary aim of reducing parenting stress or improving youth psychological outcomes. Studies that met this criterion that also delivered a parallel mindfulness intervention to a child of the participant parents were included. Studies were excluded if they reported on an intervention that was not a mindfulness-based intervention or if the intervention incorporated other forms of therapy or training such as behavioral parent training, acceptance and commitment therapy or cognitive therapy. Studies were also excluded if they used an individual case series or qualitative design.

Search Strategy and Information Sources

A comprehensive literature search was conducted between 9 August and 11 October 2018, in the PsycInfo, Medline, PubMed, CINAHL, Web of Science, Cochrane Central Register of Controlled Trials and ProQuest Dissertations & Theses databases, for peer-reviewed articles and published dissertations indexed up to and including 30 September, 2018. In PsycInfo, we searched the database subject headings Mindfulness and Meditation, and the keywords mindful* and meditation, in combination with the subject headings Parenting, Parents, Parenting Style, Parenting Skills, Parental Attitudes, Parent Training, Childrearing Attitudes, Childrearing Practices, Family Intervention and Family Therapy and the key words parent*, child?rearing, family intervention*, and family therap*. For the

search, no limitations were placed on the language in which the study was reported. The reference lists of included articles were also searched for relevant studies but no additional studies were identified in this way.

The database search was conducted by the first author. After removal of duplicates, a title and abstract screening of all articles was conducted by the first author to assess the studies against the eligibility criteria. One-third of the articles were also screened independently by a Masters-level graduate student in clinical psychology. A full-text review of the short-listed articles was then conducted independently by both the first author and the same graduate student, with 92% agreement between the two reviewers on the selection of studies for inclusion in the review.

Data Extraction

All data was extracted by the first author. The data extracted from each study included participant characteristics, youth age and gender, parent and youth psychopathology, study design, and details of the intervention. These study details are presented in **Table 1**.

Effect sizes reported by the study authors for parenting stress and youth psychological outcomes were also extracted and are included in **Tables 2, 3**, respectively.

Quantitative data needed for calculation of effect sizes in the meta-analysis were also extracted. Where a study did not report the data required for calculation of effect sizes, they were requested by email from the corresponding author of the study. If no response was received, the study was included in the systematic review (in **Tables 1–3**), but not included in the quantitative analyses.

Data Analysis

The meta-analysis was conducted using the Comprehensive Meta-Analysis program, version 3.0 (CMA). Two types of summary effect were calculated, using means and standard deviations whenever these were available, and statistics such as t and p when they were not. For studies reporting pre- and post-intervention outcome data, we calculated Hedges' g within-group effect sizes. For studies comparing outcomes of mindfulness and control groups, we calculated Hedges' g between-group differences in effect size. Hedges' g is a weighted mean effect size that corrects for potential bias due to small sample sizes (Hedges and Olkin, 1985). Cohen's guidelines that an effect size of 0.20 is small, 0.50 is moderate and 0.80 is large (Cohen, 1988) may be applied to both Cohen's d and Hedges' g effect sizes. For all analyses, a correlation of $r = 0.70$ was assumed between pre- and post-intervention measures (Rosenthal, 1993). Random-effects models were used for main effects analyses, to reflect the assumption that the true effect size would vary from study to study because study participants were drawn from different populations. Each summary effect reported in this paper is therefore an estimate of the mean of a distribution of true effects (Borenstein et al., 2009). Heterogeneity amongst studies in each main-effect analysis was assessed using the Q and I^2 statistics. Q reflects the distance of each study from the summary effect. A significant Q -statistic indicates variance in true effects, rather than variance due only to random sampling

error (Borenstein et al., 2009). I^2 reflects the proportion of observed variance in effects that is due to heterogeneity, or variance in true effects (Higgins et al., 2003). Higgins et al. suggest that I^2 values of 25, 50, and 75% indicate low, moderate, and high heterogeneity, respectively.

Several methodological issues arose in connection with the calculation of the summary effect size for parenting stress. All studies except one reported either a total parenting stress score or the score from a single parenting stress subscale. A parenting stress effect size was therefore calculated for each of these studies, using the single reported outcome score. However, Chaplin et al. (2018) reported separate data for three subscales of the Stress Index for Parents of Adolescents (SIPA; Sheras et al., 1998). Rather than including each of these three subscales as independent effects in the meta-analysis, the procedure described by Borenstein et al. (2009) was followed to create a single, composite effect for this study. Using a single effect ensures that additional weight is not given to this study, as would be the case if the subscales were treated as independent of each other. It also ensures that the precision of the summary effect is not over-estimated due to the positive correlations between each subscale (Borenstein et al., 2009). Under this procedure, the effects for each subscale were averaged to give a composite parenting stress effect size. To calculate the variance of the composite effect, a correlation between the subscales of $r = 0.55$ was used, based on the reported correlations between the three relevant subscales of $r = 0.52–0.57$ (Sheras et al., 1998). A similar issue arose in relation to the parenting stress reporter. Although the majority of studies presented data for a single parenting stress reporter, van de Weijer-Bergsma et al. (2012) reported separate data for mothers and fathers. As mothers and fathers were reporting their levels of stress in respect of the same adolescent, the mother and father effects were not independent. Accordingly, a composite mother/father effect size was calculated following the procedure described above, using a correlation between the two outcomes of $r = 0.60$. This r -value was chosen using the correlations between mother- and father-reports of child anxiety ($r = 0.68$) and parental rearing (r s between 0.39 and 0.49) reported in Bögels and van Melick (2004), as a guide. Finally, Potharst et al. (2018) reported data separately for parents participating in clinical and non-clinical settings. The effects reported for these two settings have been included separately in all analyses, as if they were data from two separate studies, because they are based on reports from independent groups of parents participating in independent settings.

Due to the limited number of studies reporting on specific youth psychological outcomes, a detailed quantitative analysis was not conducted in respect of each youth outcome covered by the reviewed studies. Instead, specific outcomes were grouped into internalizing, externalizing, cognitive, and social domains, as the reported outcomes all fell within one of these four domains of functioning. In addition, to provide a large enough pool of effects for moderator analyses to be conducted, a new "overall youth outcomes" variable was created. This variable was created by first calculating effect sizes for youth outcomes reported by parents and then calculating a single, composite parent-reported effect size for each study using the Borenstein et al. (2009)

TABLE 1 | Details of included studies.

Study	Sample size and parents' gender	Youth age (range) in years and gender	Parent clinical status [^]	Youth clinical status and primary diagnosis	Study design and conditions	Intervention characteristics		
						Intervention program	Intervention group/s	Sessions
Bazzano et al. (2015)	N = 66 parents/caregivers (77% mothers/female)	NR	Non-clinical	Clinical: ASD (59%), ID (21%), cerebral palsy (5%), Down syndrome (3%), other diagnoses (11%)	Uncontrolled trial: 1. MP	MBSR adapted for parents of children with disabilities	Parent/caregiver group	8 weeks × 2 h + 4 h silent retreat; total 20 h
Bögels et al. (2008)	N = 14 parents (57% mothers) and 14 adolescents	M = 14.4 (11–17) 57% boys	Clinical: DD (21%), PTSD (21%), ADHD (14%), PDD (14%), Asperger's (7%)	Clinical: ODD (43%), PDD (21%), ADHD (14%), CD (14%) ASD (7%)	WLC trial: 1. MP	MBCT adapted for parents	Parent group and separate adolescent mindfulness group	8 weeks × 1.5 h; total 12 h (for both parent and adolescent groups)
Bögels et al. (2014)	N = 86 parents (89% mothers)	M = 10.7 (2–21) 60% boys	Clinical: Parent-child relational problem (58%), DD (16%), adjustment disorder (8%), BD (2%), ADHD (1%), BPD (1%)	Clinical: ADHD (47%), ASD (21%), AD (7%), DD (5%), ODD (4%), LD (4%), CD (1%), schizophrenia (1%)	WLC trial: 1. MP	MP (Bögels and Restifo, 2013)	Parent group	8 weeks × 3 h; total 24 h
Chan and Neece (2018)#	N = 80 parents (96% mothers)	M = 4.18 (2.5–5) 71% boys	Non-clinical	Clinical: ASD (64%), other developmental delay (36%)	RCT: 1. MBSR 2. Wait list control	MBSR: MBSR program Control: Nil (offered MBSR program after completion of waitlist period)	MBSR: Parent group Control: Nil	MBSR: 8 weeks × 2 h + 6 h retreat; total 22 h Control: Nil
Chaplin et al. (2018)	N = 100 mothers	M = 14.04 (12–17) 48% boys	Non-clinical: self-reported parenting stress	Non-clinical: inclusion criteria did not require diagnosis or referral, but 53% of families receiving psychotherapy	RCT: 1. MP 2. Parent education control	MP: Parenting Mindfully (based on MBSR and Duncan et al., 2009) Control: presentation, handouts on adolescent development and parenting, question time	MP: Parent group Control: Parent group	MP: 8 weeks × 2 h; total 16 h Control: 3 meetings × 30 min each
Corthorn (2018)	N = 43 mothers	M = 2.9 (intervention group) and M = 3.0 (control group). Overall range = 2–5 Gender NR	Non-clinical	Non-clinical	Controlled trial: 1. MP 2. No treatment control	MP: MBSR adapted for parents Control: Nil	MP: Parent group Control: Nil	MP: 8 weeks × 2 h; total 16 h Control: Nil
De Bruin et al. (2015)	N = 29 parents (62% mothers) and 23 adolescents	M = 15.8 (11–23) 74% boys	Non-clinical	Clinical: ASD (52%), PDD (48%)	Uncontrolled trial: 1. MP	MP (Bögels and Restifo, 2013)	Parent group and separate adolescent mindfulness group	9 weeks × 1.5 h; total 13 h (for both parent and adolescent groups)
Eames et al. (2015)	N = 23 mothers	M = 3.14 (1–6) 55% boys	Non-clinical: low socio-economic community	Non-clinical	Uncontrolled trial: 1. MP	Mindfulness-based well-being for parents (adapted from MBSR)	Parent group	8 weeks × 2 h; total 16 h

(Continued)

TABLE 1 | Continued

Study	Sample size and parents' gender	Youth age (range) in years and gender	Parent clinical status [^]	Youth clinical status and primary diagnosis	Study design and conditions	Intervention characteristics		
						Intervention program	Intervention group/s	Sessions
Ferraioli and Harris (2013)	<i>N</i> = 15 parents (66% mothers)	NR (all under 18)	Non-clinical	Clinical: ASD (66%), PDD (34%)	RCT: 1. MP 2. Skills-based parent training Participants matched on parenting stress scores.	MP: Mindfulness-based parent training (adapted from mindfulness module, Linehan, 1993) Control: behavioral parent training for parents of children with ASD	MP: Parent group Control: Parent group	MP: 8 weeks × 2 h; total 16 h Control: 8 weeks × 2 h; total 16 h
Haydicky et al. (2015)	<i>N</i> = 17 parents (94% mothers) and 18 adolescents	<i>M</i> = 15.5 (13–18) 72% boys	Non-clinical	Clinical: ADHD	WLC trial: 1. MP	MP (adapted from Bögels et al., 2008)	Parent group and separate adolescent mindfulness group	8 weeks × 1.5 h; total 12 h (for both parent and adolescent groups)
Jones et al. (2018)	<i>N</i> = 21 parents (86% mothers)	<i>M</i> = 10.53 (4–16) Note: mean VABS functioning ability = 4.95 62% boys	Non-clinical	Clinical: ASD (76%), ID (10%), cerebral palsy (10%), Down's syndrome (5%)	Uncontrolled trial: 1. MP	Mindfulness-based wellbeing for parents (adapted from MBSR)	Parent group	8 weeks × 2 h; total 16 h
Lewallen and Neece (2015)#	<i>N</i> = 24 mothers	<i>M</i> = 3.40 (2.5–5) 67% boys	Non-clinical	Clinical: ASD (83%), other developmental delay (17%)	RCT: 1. MBSR 2. Wait list control	MBSR: MBSR program Control: Nil (offered MBSR after waitlist)	MBSR: Parent group Control: Nil	MBSR: 8 weeks × 2 h + 6 h retreat; total 22 h Control: Nil
Lo et al. (2017a)	<i>N</i> = 180 parents (94% mothers)	NR (pre-school age) 77% boys	Non-clinical	Clinical: ASD (57%), developmental delay (28%), ADHD (7%), other diagnosis (8%)	RCT: 1. MP 2. No treatment control	MP: MP adapted from Bögels (2013) and Coatsworth et al. (2014) Control: Nil (mindfulness workshop, after study)	MP: Parent group Control: Nil	MP: 6 weeks × 1.5 h; total 9 h Control: Nil
Lo et al. (2017b)	<i>N</i> = 100 parents (96% mothers)	<i>M</i> = 6.25 (5–7) 83% boys	Non-clinical	Clinical: ADHD	RCT: 1. MP 2. Wait list control	MP: MP adapted from Bögels and Restifo (2014) and Coatsworth et al. (2010) Control: Nil (offered MP after waitlist)	MP: Parent group and separate child mindfulness group Control: Nil	MP: 6 weeks × 1.5 h; total 9 h (for parent groups). 8 weeks × 1 h (for child groups). Control: Nil
Maloney and Altmaier (2007)	<i>N</i> = 12 parents (83% mothers) and 12 children	<i>M</i> = 3.9 (2.75–6) Gender NR	Non-clinical: participants recently divorced or separated	Non-clinical	Uncontrolled trial: 1. MP	MP (Placone-Willey, 2002)	Parent group	12 weeks; session length NR; total 15 h
Mann et al. (2016)	<i>N</i> = 38 parents (95% mothers)	Mean NR (2–6) Gender NR	Non-clinical: history of depression (≥ 3 episodes and in full/partial remission)	Non-clinical	RCT: 1. MP + usual care 2. Usual care control	MP: MBCT adapted for parents with history of depression Control: usual care	MP: Parent group Control: Nil	MP: 8 weeks, session length and total hours NR Control: Nil

(Continued)

TABLE 1 | Continued

Study	Sample size and parents' gender	Youth age (range) in years and gender	Parent clinical status [^]	Youth clinical status and primary diagnosis	Study design and conditions	Intervention characteristics		
						Intervention program	Intervention group/s	Sessions
Meppelink et al. (2016)	<i>N</i> = 70 parents (93% mothers)	<i>M</i> = 8.7 (range NR) 57% boys	Non-clinical	Clinical: ASD (29%), parent-child interaction problem (26%), ADHD (24%), AD (3%), ODD (1.5%), adjustment disorder (1.5%), other diagnosis (6%)	Uncontrolled trial: 1. MP	MP (Bögels and Restifo, 2014)	Parent group	8 weeks × 3 h; total 24 h
Neece (2014)	<i>N</i> = 46 parents (78% mothers)	<i>M</i> = 3.84 (2.5–5) 71% boys	Non-clinical	Clinical: ASD	RCT: 1. MBSR 2. Wait list control	MBSR: MBSR Control: Nil (offered MBSR after waitlist)	MBSR: Parent group Control: Nil	MBSR: 8 weeks × 2 h + 6 h retreat; total 22 h Control: Nil
Potharst et al. (2017)	<i>N</i> = 37 mothers	<i>M</i> = 0.86 (0–1.5) 50% boys	Clinical: mental health disorder (84%) or referral for difficulties related to mothering	Non-clinical: sleeping problems (27%), excessive crying (18%)	Uncontrolled trial: 1. MP	MP adapted for mothers with a baby (Bögels et al., 2014)	Mother/baby group	8 weeks × 2 h; total 16 h
Potharst et al. (2018) ^a	<i>N</i> = 98 parents (82% mothers) Non-clinical setting	<i>M</i> = 8.9 (0–35.3) Gender NR	Non-clinical, self-reported parenting stress	Non-clinical	WLC trial: 1. MP	MP shortened for non-clinical context (Bögels and Restifo, 2013)	Parent group	8 weeks × 2 h; total 16 h ^b
Potharst et al. (2018) Clinical setting	<i>N</i> = 89 parents (80% mothers)	<i>M</i> = 11.7 (2.6–25.4) Gender NR	Non-clinical	Clinical: ADHD (31%), ASD (23%), DICA (10%), AD (5%), PTSD (4%), MD (1%), OCD (1%), ODD (1%), IED (1%), unknown diagnosis (21%)	Uncontrolled trial: 1. MP	MP (Bögels and Restifo, 2013)	Parent group	8 weeks × 3 h + 3 h booster session, 8 weeks post-completion; total 27 h ^c
Racey et al. (2017)	<i>N</i> = 29 parents (97% mothers) and 25 adolescents	<i>M</i> = 16.4 (14–18) 0% boys	Non-clinical: 50% parents had history of depression	Clinical: partially recovered from depressive episode	Uncontrolled trial: 1. MBCT	MBCT adapted for parents and youth	Parent group and separate adolescent mindfulness group	8 weeks (for both parent and adolescent groups); session length and total hours NR
Ridderinkhof et al. (2017)	<i>N</i> = 74 parents (58% mothers) and 45 adolescents	<i>M</i> = 13.03 (8–19) 80% boys	Non-clinical	Clinical: ASD (IQ ≥ 80)	Uncontrolled trial: 1. MP	MP adapted for parents of children with ASD from Bögels and Restifo (2014)	Parent group and separate adolescent mindfulness group	9 weeks × 1.5 h (for both parent and adolescent groups) + 1x joint parent/adolescent booster session, 9 weeks post-completion; total 15 h
Short et al. (2017)	<i>N</i> = 59 mothers	NR (≤ 3) Gender NR	Clinical: in treatment for opioid and other substance-use disorders	Non-clinical	Uncontrolled trial: 1. MP	MP adapted from MBSR for parents with high rates of trauma	Parent group	12 weeks × 2 h; total 24 h
van de Weijer-Bergsma et al. (2012)	<i>N</i> = 11 parents (55% mothers) and 10 adolescents	<i>M</i> = 13.4 (11–15) 50% boys	Non-clinical	Clinical: ADHD	Uncontrolled trial: 1. MP	MP (Bögels et al., 2008 and van der Oord et al., 2012)	Parent group and separate adolescent mindfulness group	8 weeks × 1.5 h (for both parent and child groups) + 1x joint parent/adolescent booster session, 8 weeks post-completion; total ~13 h

(Continued)

TABLE 1 | Continued

Study	Sample size and parents' gender	Youth age (range) in years and gender	Parent clinical status [^]	Youth clinical status and primary diagnosis	Study design and conditions	Intervention characteristics		
						Intervention program	Intervention group/s	Sessions
van der Oord et al. (2012)	N = 22 parents (95% mothers) and 22 children	M = 9.55 (8–12) 73% boys	Non-clinical	Clinical: ADHD	WLC trial: 1. MP	MP adapted for parents of children with ADHD from Bögels et al. (2008) and Bögels et al. (2010)	Parent group and separate mindfulness group for children	8 weeks × 1.5 h; total 12 h (for both parent and child groups)
Voos (2017)	N = 21 parents (71% mothers)	M = 9.5 (range NR; <18) 91% boys	Non-clinical	Clinical: ASD	Uncontrolled trial: 1. MP	MP (Bögels and Restifo, 2013)	Parent group	8 weeks × 1.5 h; total 12 h
Xu (2017) [#]	N = 32 parents (90% mothers)	M = 4.68 (2.5–5) 71% boys	Non-clinical	Clinical: ASD (48%), ID or other developmental delay (36%), Down's syndrome (16%)	Uncontrolled trial: 1. MBSR	MBSR	Parent group	8 weeks × 2 h + 6 h retreat; total 22 h
Zhang et al. (2017)	N = 11 parents (64% mothers) and 11 children	M = 9.5 (8–12) 73% boys	Non-clinical	Clinical: ADHD	Uncontrolled trial: 1. MP	MP (van der Oord et al., 2012; van de Weijer-Bergsma et al., 2012)	Parent group and separate child mindfulness group	8 weeks × 1.5 h; total 12 h (for both parent and child groups)

[^]For both parent and youth clinical status, "Clinical" means that the participating parent or their child were selected for the study based on either a clinical diagnosis, or referral for clinical assistance, for a mental health difficulty. "Non-clinical" means the participating parents, or their child, were not selected for the study based on either a clinical diagnosis or referral for clinical assistance. A non-clinical group of parents or youth may still, therefore, include individuals who meet criteria for a psychiatric or physical health condition; NR, Not reported; MBSR, Mindfulness-Based Stress Reduction (Kabat-Zinn et al., 1992); MBCT, Mindfulness-Based Cognitive Therapy (Segal et al., 2002); MP, mindful parenting; WLC, waitlist controlled; RCT, randomized, controlled trial; ASD, an autism spectrum disorder; ID, an intellectual disability; DD, a depressive disorder; PTSD, post-traumatic stress disorder; ADHD, attention deficit/hyperactivity disorder; PDD, pervasive developmental disorder; ODD, oppositional defiant disorder; CD, conduct disorder; BD, bipolar disorder; BPD, borderline personality disorder; AD, anxiety disorder; LD, learning disorder; OCD, obsessive compulsive disorder; MD, mood disorder; IED, intermittent explosive disorder; DICA, disorder of infancy, childhood or adolescence not otherwise specified; VABS, Vineland Adaptive Behavior Scales (Sparrow et al., 1984); [#]Chan and Neece (2018), Lewallen and Neece (2015), and Xu (2017) are included in this table for clarity, however these three studies appear to utilize samples of participants overlapping with Neece (2014); ^aPotharst et al. (2018) included two separate streams of participants. One stream attended the intervention in non-clinical settings, the other attended in clinical settings. Study characteristics are reported separately for each setting, given they were independent from each other; ^bbasic non-clinical program was 8 weeks × 2 h. However, there were 4 locations (A, B, C, and D) and some varied the basic program. B ran 2.5 h sessions, D ran 3 h sessions, and B and D offered a follow-up session; ^cbasic clinical program was 8 weeks × 3 h + 3 h booster. This was run at 4 locations (E, F, G, and H). Location E adjusted the session length to 2.5 h.

TABLE 2 | Reported results of mindfulness intervention, for parenting stress.

Study	Parenting stress measure [#]	Within group results		Between group results	
		Pre-post	Pre-follow up [^]	Pre-post	Pre-follow up [^]
Bazzano et al. (2015)	PSS	NR ^a (+)	NR ^a (+)	–	–
Bögels et al. (2014)	PSI, Competence scale	$d = 0.44$ (+)	$d = 0.47$ (+)	–	–
Chaplin et al. (2018)	SIPA subscales:				
	Parent Life Restrictions	–	–	$d = 0.53$ (+)	–
	Parent Incompetence/Guilt	–	–	$d = -0.14$	–
	Relationship with Partner	–	–	$d = 0.59$ (+)	–
Corthorn (2018)	PSI-SF	–	–	NR (+)	$d = 0.66$ (+)
De Bruin et al. (2015)	PSI	$d = 0.21$ (+)	$d = -0.01$	–	–
Eames et al. (2015)	PSI-SF	$g = 0.81$ ^b	–	–	–
Ferraioli and Harris (2013)	PSI-SF	$d = 2.03$ (+)	$d = 1.01$	$d = 1.59$ (+)	$d = 0.63$
Haydicky et al. (2015)	SIPA	NR	$d = 0.81$ (+)	–	–
Jones et al. (2018)	QRS-PFP	$d = -0.12$	–	–	–
Lo et al. (2017a)	PSI-SF	–	–	$d = 0.34$ (+)	–
Lo et al. (2017b)	PSI-SF	–	–	$d = 0.19$ (+)	–
	HRV Low frequency ^c	–	–	$d = 0.00$	–
Maloney and Altmaier (2007)	PSI-SF	$d = 0.26$	–	–	–
Mann et al. (2016)	PSI-SF	–	–	$d = 0.40$ (4 mo.)	$d = 0.40$ (9 mo.)
Neece (2014)	PSI-SF, Parental Distress scale	$d = 0.70$ (+) ^d	–	$d = 0.70$ (+)	–
Potharst et al. (2017)	PSI, modified version	$d = 0.25$	$d = 0.44$ (+); $d = 0.53$ (+) (1 yr.)	–	–
Potharst et al. (2018)	OBVL	$d = 0.37$ (+)	$d = 0.67$ (+)	–	–
Ridderinkhof et al. (2017)	PSI, Competence scale	$d = 0.21$ (+)	$d = 0.39$ (+); $d = 0.28$ (+) (1 yr.)	–	–
Short et al. (2017)	PSI-SF	$d = 0.04$	–	–	–
van de Weijer-Bergsma et al. (2012)	PSI-SF	$d = -0.50$ ^M ; $d = 0.70$ ^F (+)	$d = -0.20$ ^M ; $d = 1.1$ ^F (+)	–	–
van der Oord et al. (2012)	PSI-SF	NR (ns)	$d = 0.57$ (+)	–	–
Voos (2017)	PSI	NR	$d = 0.94$ (+)	–	–
Zhang et al. (2017)	PSI-SF	$d = -0.18$ (+)	–	–	–

[#] = all parenting stress effects are based upon the reports of the parent/s who attended the intervention, and therefore combine mother and father reports, except in the case of van de Weijer-Bergsma et al. (2012) which reports mother and father results separately; [^] = 8 week follow up, unless otherwise indicated; (+) indicates effect size is significant (as reported by the relevant study author/s), $p < .05$. For within-group results, effect size is reported as a positive number if there was improvement in the outcome, and as a negative number if there was a deterioration. For between-group results, effect size is reported as a positive number if the outcome improved more in the mindfulness group than the control group; NR = not reported; ns = not significant; ^a = d not reported, but % change reported as significant; ^b g = Hedges' glass; ^c = only low frequency heart rate variability (HRV) is included, as the effect for high frequency HRV was reported only as non-significant; ^d = the within-group parenting stress effect is reported in Xu (2017); ^M = mother; ^F = father; PSS = Parental Stress Scale (Berry and Jones, 1995); PSI = Parenting Stress Index (Abidin, 1983); PSI-SF = Parenting Stress Index, Short Form (Abidin, 1995); SIPA = Stress Index for Parents of Adolescents (Sheras et al., 1998); QRS-PFP = Questionnaire on Resources and Stress Short Form – Parent and Family Problems subscale (Friedrich et al., 1983); OBVL = Opvoedingsbelastingvragenlijst, Veerman et al. (2014), a Dutch parenting stress questionnaire.

procedure described above, assuming a correlation between the outcomes within each study of $r = 0.60$. In studies reporting a broadband scale for youth outcomes (for example, “Internalizing problems”), the effect for the broadband scale was used in the calculation of the overall youth outcomes summary effect size. Where a study also reported data for the specific scales making up that broadband scale, specific scale effects were not included. In studies where no broadband scale was used, but more than one youth psychological outcome was reported (for example, anxiety and depression), then these were combined to form a composite effect. For studies reporting data for only one relevant youth outcome, then the effect size for that outcome was used for that study. For the two studies that reported separate

youth outcome data for two parents or a parent and another family caregiver (van de Weijer-Bergsma et al., 2012; Lewallen and Neece, 2015), a composite parent-reported effect size was calculated using a correlation of $r = 0.60$ between the two parent or caregiver outcomes. The same two studies also included data from tutor reports on some outcomes. However, for consistency with the other studies, the tutor-reported data was not included in the calculation of the youth outcomes effect for those two studies. Data from youth-reported and objective tests of youth outcomes were also not used, as most studies did not include these data. The single youth outcome effect size for each study was then combined with the others to generate a summary, parent-reported overall youth outcome effect size.

TABLE 3 | Reported results of mindfulness intervention, for youth psychological outcomes.

Study	Outcomes	Measure	Reporter	Within group results		Between group results (Pre-post)
				Pre-post	Pre-follow up [^]	
Bögels et al. (2008)	Mindfulness	MAAS	Youth	$d = 0.50 (+)$	$d = 0.50 (+)$	–
	Internalizing outcomes:					
	Internalizing problems	YSR	Youth	$d = 0.50$	$d = 0.50$	–
		CBCL	Parent	$d = -0.10$	$d = 0.30$	–
	Happiness	SHS	Youth	$d = 0.60 (+)$	$d = 0.60 (+)$	–
	Externalizing outcomes:					
	Externalizing problems	YSR	Youth	$d = 1.10 (+)$	$d = 1.20 (+)$	–
		CBCL	Parent	$d = 0.30$	$d = 0.40$	–
	Self-control	SCRS	Youth	$d = 0.80 (+)$	$d = 0.60 (+)$	–
	Cognitive outcomes:					
	Thought problems	YSR	Youth	$d = 0.40$	$d = 0.30$	–
		CBCL	Parent	$d = 0.00$	$d = 0.10$	–
	Attention problems	YSR	Youth	$d = 1.00 (+)$	$d = 0.90 (+)$	–
		CBCL	Parent	$d = 0.30$	$d = 0.50$	–
Sustained attention	D2 Test of Attention	Youth	$d = 0.60 (+)$	$d = 1.10 (+)$	–	
Social outcomes:						
Social problems	YSR	Youth	$d = 0.60 (+)$	$d = 0.50 (+)$	–	
	CBCL	Parent	$d = 0.20$	$d = 0.30$	–	
Social behavior	CSBQ	Parent	$d = -0.10$	$d = 0.40$	–	
Bögels et al. (2014)	Internalizing outcomes:					
	Internalizing problems	CBCL	Parent	$d = 0.45 (+)$	$d = 0.47 (+)$	–
	Externalizing outcomes:					
Externalizing problems	CBCL	Parent	$d = 0.31 (+)$	$d = 0.37 (+)$	–	
De Bruin et al. (2015)	Mindfulness	MAAS – A	Youth	$d = -0.26$	$d = -0.02$	–
	Internalizing outcomes:					
	Worry	PSWQ	Youth	$d = -0.04$	$d = 0.28$	–
	Rumination	RRS	Youth	$d = 0.34$	$d = 0.92 (+)$	–
	Well-being	WHO-5	Youth	$d = 0.55 (+)$	$d = 0.63 (+)$	–
	Externalizing outcomes:					
	Autism core symptoms	AQ	Youth	$d = -0.04$	$d = 0.06$	–
		Parent	$d = 0.09$	$d = -0.15$	–	
	Social outcomes:					
Social responsiveness	SRS	Parent	$d = -0.01$	$d = 0.33$	–	
Haydicky et al. (2015) ^a	Internalizing outcomes:					
	Internalizing problems	RCADS	Youth	$d = 0.26$	$d = 1.01 (+)$	–
			Parent	NR	$d = 0.49$	–
	Anxiety	RCADS	Youth	$d = 0.25$	$d = 1.02 (+)$	–
			Parent	NR	$d = 0.37$	–
	Depression	RCADS	Youth	$d = 0.38$	$d = 0.64 (+)$	–
			Parent	NR	$d = 0.55$	–
	Externalizing outcomes:					
	ODD	Conners	Youth	$d = -0.45$	$d = 0.21$	–
			Parent	NR	$d = 0.45$	–
CD	Conners	Youth	NR	$d = 0.46$	–	
		Parent	$d = 0.70 (+)$	$d = 0.32$	–	
Hyperactivity/impulsivity	Conners	Youth	NR	$d = 0.16$	–	
		Parent	NR	$d = 0.41$	–	

(Continued)

TABLE 3 | Continued

Study	Outcomes	Measure	Reporter	Within group results		Between group results (Pre-post)
				Pre-post	Pre-follow up [^]	
Jones et al. (2018)	Cognitive outcomes:					
	Inattention	Conners	Youth	NR	$d = 0.12$	–
			Parent	$d = 0.62$	$d = 0.20$	
	Learning problems	Conners	Youth	NR	$d = -0.64$	–
			Parent	$d = 0.46$	$d = 0.29$	
	Executive function	Conners	Parent	$d = 0.36$	$d = 0.24$	–
	Social outcomes:					
	Peer relations	Conners	Parent	$d = 1.07 (+)$	$d = 0.02$	–
	Family relations	Conners	Youth	$d = -0.34$	$d = 0.31$	–
	Externalizing outcomes:					
Behavior problems	SDQ	Parent	$d = -0.14$	–	–	
Social outcomes:						
Prosocial behavior	SDQ	Parent	$d = 0.04$	–	–	
Lo et al. (2017a)	Externalizing outcomes:					
Behavior problems	ECBI	Parent	–	–	NR (ns)	
Behavior severity	ECBI	Parent	–	–	NR (ns)	
Lo et al. (2017b)	Internalizing outcomes:					
Internalizing problems	CBCL	Parent	–	–	$d = 0.46 (+)$	
Externalizing outcomes:						
Externalizing problems	CBCL	Parent	–	–	$d = 0.29 (+)$	
ADHD symptoms	SWAN	Parent	–	–	$d = 0.63 (+)$	
Executive function ^b	CANT Conflict monitoring	Youth	–	–	$d = 0.41 (+)$	
Mann et al. (2016)	Externalizing outcomes:					
Behavior problems	SDQ	Parent	–	–	$d = 0.60 (+)$ (4 mo.)	
Meppelink et al. (2016)	Internalizing outcomes:					
Internalizing problems	CBCL	Parent	$d = 0.34 (+)$	$d = 0.31 (+)$	–	
Externalizing outcomes:						
Externalizing problems	CBCL	Parent	$d = 0.22 (+)$	$d = 0.37 (+)$	–	
Cognitive outcomes:						
Attention problems	CBCL	Parent	$d = 0.26 (+)$	$d = 0.42 (+)$	–	
Neece (2014) [including Lewallen and Neece (2015); Xu (2017); Chan and Neece (2018)]	Internalizing outcomes:					
Internalizing problems	CBCL	Parent	–	–	$d = -0.13$	
Emotional reactivity	CBCL	Parent	–	–	$d = -0.31$	
Anxious/depressed	CBCL	Parent	–	–	$d = -0.25$	
Somatic complaints	CBCL	Parent	–	–	$d = 0.24$	
Withdrawn/depressed	CBCL	Parent	–	–	$d = -0.04$	
Sleep problems	CBCL	Parent	–	–	$d = 0.28$	
DSM Affective problems	CBCL	Parent	–	–	$d = 0.57$	
DSM Anxiety problems	CBCL	Parent	–	–	$d = -0.20$	
Emotion dysregulation ^c	DCS	Observer	$\beta = 0.27, sr^2 = 0.06$	–	–	
Emotion regulation ^d	ERC	Parent	$d = 0.12$	–	–	
Externalizing outcomes:						
Externalizing problems	CBCL	Parent	–	–	$d = 0.45$	
Aggressive behavior	CBCL	Parent	–	–	$d = 0.30$	
DSM ADHD problems	CBCL	Parent	–	–	$d = 0.85 (+)$	
DSM ODD	CBCL	Parent	–	–	$d = 0.20$	

(Continued)

TABLE 3 | Continued

Study	Outcomes	Measure	Reporter	Within group results		Between group results (Pre-post)
				Pre-post	Pre-follow up [^]	
	Cognitive outcomes:					
	Attention problems	CBCL	Parent	–	–	$d = 0.71$
	DSM Developmental problems	CBCL	Parent	–	–	$d = 0.17$
	Social outcomes ^e :	SSIS				
	Self-control		Parent	$d = 0.54 (+)$	–	–
			Secondary Informant	$d = 0.36 (+)$		
			Teacher	$d = 0.59 (+)$		
	Communication		Parent	$d = 0.03$	–	–
			Secondary Informant	$d = 0.10$		
			Teacher	$d = 0.75 (+)$		
	Cooperation		Parent	$d = -0.03$	–	–
			Secondary Informant	$d = 0.12$		
			Teacher	$d = 0.83 (+)$		
	Assertion		Parent	$d = -0.24$	–	–
			Secondary Informant	$d = 0.74 (+)$		
			Teacher	$d = 0.48 (+)$		
	Responsibility		Parent	$d = 0.18$	–	–
			Secondary Informant	$d = 0.19$		
			Teacher	$d = 0.58 (+)$		
	Empathy		Parent	$d = 0.61 (+)$	–	–
			Secondary Informant	$d = 0.27$		
			Teacher	$d = 0.58 (+)$		
	Engagement		Parent	$d = 0.61 (+)$	–	–
			Secondary Informant	$d = 0.19$		
			Teacher	$d = 0.82 (+)$		
Potharst et al. (2017)	Internalizing outcomes:					
	Positive affect	IBQ-R	Parent	$d = 0.48 (+)$	$d = 0.51 (+)$	–
	Regulating	IBQ-R	Parent	$d = 0.35$	$d = 0.06$	–
	Negative emotionality	IBQ-R	Parent	$d = 0.25$	$d = 0.19$	–
Potharst et al. (2018)	Internalizing outcomes:					
	Well-being	WHO-5	Parent	$d = 0.30 (+)$	$d = 0.11$	–
	Externalizing outcomes:					
	Behavior problems	SDQ	Parent	$d = 0.61 (+)$	$d = 0.41 (+)$	–
Racey et al. (2017)	Internalizing outcomes:					
	Depression	BDI-II	Youth	NR (+) ^f	–	–
	Rumination	RRS	Youth	NR (+) ^f	–	–
	Self-compassion	SCS	Youth	NR (+) ^f	–	–
	De-centring	EQD	Youth	NR (+) ^f	–	–
Ridderinkhof et al. (2017)	Mindfulness	CAMM ^g	Youth	$d = 0.02$	$d = 0.37; d = 0.01 (1 \text{ yr.})$	
	Internalizing outcomes:					
	Internalizing problems	YSR ^g	Youth	$d = 0.13$	$d = 0.50; d = 0.59 (1 \text{ yr.})$	–
		CBCL	Parent	$d = 0.35 (+)$	$d = 0.38 (+); d = 0.63 (+) (1 \text{ yr.})$	–
	Rumination	RRS ^g	Youth	$d = 0.44 (+)$	$d = 0.71 (+); d = -0.27 (1 \text{ yr.})$	–
	Stress	CSQ-CA	Youth	$d = 0.20$	$d = 0.63 (+); d = 0.25 (1 \text{ yr.})$	–
	Sleep problems	CSRQ	Youth	$d = 0.06$	$d = 0.28; d = 0.12 (1 \text{ yr.})$	–
	Well-being	WHO-5	Youth	$d = 0.35$	$d = 0.40; d = 0.46 (+) (1 \text{ yr.})$	–

(Continued)

TABLE 3 | Continued

Study	Outcomes	Measure	Reporter	Within group results		Between group results (Pre-post)
				Pre-post	Pre-follow up [^]	
van der Oord et al. (2012)	Externalizing outcomes:					
	Externalizing problems	YSR ^g	Youth	$d = 0.20$	$d = 0.56 (+); d = 0.61 (+) (1 \text{ yr.})$	–
		CBCL	Parent	$d = 0.21 (+)$	$d = 0.43 (+); d = 0.42 (+) (1 \text{ yr.})$	–
	Cognitive outcomes:					
	Attention problems	YSR ^g	Youth	$d = 0.22$	$d = 0.57 (+); d = 0.68 (+) (1 \text{ yr.})$	–
		CBCL	Parent	$d = 0.32 (+)$	$d = 0.44 (+); d = 0.58 (+) (1 \text{ yr.})$	–
	Social outcomes:					
	Social responsiveness	SRS	Parent	$d = 0.32 (+)$	$d = 0.33 (+); d = 0.51 (+) (1 \text{ yr.})$	–
	Externalizing outcomes:					
	Inattention	DBDRS	Parent	$d = 0.80 (+)$	$d = 0.80 (+)$	–
van de Weijer-Bergsma et al. (2012)	Hyperactivity	DBDRS	Parent	$d = 0.56 (+)$	$d = 0.59 (+)$	–
			Teacher	NR (ns)	NR (ns)	
	ODD	DBDRS	Parent	NR (ns)	NR (ns)	–
			Teacher	NR (ns)	NR (ns)	
	Mindfulness	MAAS	Youth	$d = 0.10$	$d = -0.10; d = 0.50 (16 \text{ wks.})$	–
	Internalizing outcomes:					
	Internalizing problems	YSR	Youth	$d = 0.10$	$d = 0.20; d = 0.70 (16 \text{ wks.})$	–
		CBCL	Mother	$d = 0.10$	$d = 0.00$	–
			Father	$d = 0.40$	$d = 0.50$	
			Teacher	$d = 0.20$	–	
Fatigue	FFS	Youth	$d = 0.00$	$d = 0.20; d = -0.10 (16 \text{ wks.})$	–	
Happiness	SHS	Youth	$d = -0.50$	$d = -0.40; d = -0.20 (16 \text{ wks.})$	–	
Externalizing outcomes:						
Externalizing problems	YSR	Youth	$d = -0.10$	$d = 0.50; d = 0.90 (16 \text{ wks.})$	–	
	CBCL	Mother	$d = -0.21$	$d = 0.10$	–	
		Father	$d = 0.20 (+)$	$d = 0.30 (+)$		
		Teacher	$d = 0.20$	–		
Cognitive outcomes:						
Attention problems	YSR	Youth	$d = 0.50$	$d = 0.90 (+); d = 1.0 (16 \text{ wks.})$	–	
	CBCL	Mother	$d = 0.10$	$d = 0.30$	–	
		Father	$d = 0.60$	$d = 1.50 (+)$		
		Teacher	$d = 0.30$	–		
Metacognitive problems	BRIEF	Mother	$d = -0.30$	$d = 0.00$	–	
		Father	$d = 1.00$	$d = 1.80 (+)$		
		Teacher	$d = 0.20$	–		
Behavior regulation problems	BRIEF	Mother	$d = -0.20$	$d = 0.10$	–	
		Father	$d = 0.10$	$d = 0.60 (+)$		
		Teacher	$d = -0.50$	–		
Reaction time	ANT	Youth	$d = -0.20$	$d = -0.10; d = -0.70 (16 \text{ wks.})$		
Sustained attention ^h	ANT	Youth	$d = 0.20 \text{ to } d = 0.40$	$d = 0.80 (+); d = 0.40 \text{ to } d = 0.50 (16 \text{ wks.})$		
Impulsivity ^j	ANT	Youth	$d = 0.00 \text{ to } d = 0.50 (+)$	$d = 0.30 \text{ to } d = 0.70; d = 0.10 \text{ to } d = 0.70 (16 \text{ wks.})$		
Zhang et al. (2017)	Externalizing outcomes:					
Behavior problems	ECBI	Parent	$d = 0.25$	–	–	
Behavior severity	ECBI	Parent	$d = 0.36 (+)$	–	–	

(Continued)

TABLE 3 | Continued

Study	Outcomes	Measure	Reporter	Within group results		Between group results (Pre-post)
				Pre-post	Pre-follow up [^]	
	Cognitive outcomes:					
	Metacognitive problems	BRIEF	Parent	$d = 0.00$	–	–
	Behavior regulation problems	BRIEF	Parent	$d = 0.01$	–	–
	Sustained attention ^j	Tea-CH	Youth	$d = -0.24$ to $d = 0.76$	–	–
	Selective/focussed attention ^k	Tea-CH	Youth	$d = 0.80$ to $d = 1.53$ (+)	–	–
	Attentional control/switching ^l	Tea-CH	Youth	$d = -0.16$ to $d = 0.81$	–	–
	Inattention ^m	CCPT	Youth	$d = -0.43$ to $d = 2.29$ (+)	–	–
	Impulsivity ⁿ	CCPT	Youth	$d = -0.73$ to $d = 0.81$	–	–
	Vigilance ^o	CCPT	Youth	$d = -0.13$	–	–
	Sustained attention ^p	CCPT	Youth	$d = 0.28$	–	–

For within-group results, effect size is reported as a positive number if there was an improvement in the outcome, and as a negative number if there was a deterioration. For between-group results, effect size is reported as a positive number if the outcome improved more in the mindfulness group than the control group; + indicates effect size is significant, $p < 0.05$; [^], 8 week follow up, unless otherwise indicated; NR, not reported by study authors; ns, not significant; ^a the follow-up effects reported by Haydicky et al. (2015) are post-follow up; ^b only the conflict monitoring effect is included, as effects for alerting, orienting, response time, and accuracy were reported only as non-significant; ^c Emotion dysregulation effect is reported in Chan and Neece (2018); ^d Emotion regulation is reported in Xu (2017); ^e Social skills are reported in Lewallen and Neece (2015); ^f d not reported, but mean change reported as significant; ^g these measures were only completed by adolescents ≥ 11 years; ^h Sustained attention measured by “misses” measures of Amsterdam Neuropsychological Tasks (ANT; De Sonneville, 1999); ⁱ Impulsivity measured by “false alarms” measures of ANT; ^j Sustained attention measured by Score1, Sky Search DT, Walk Do Not Walk, and Code Transmission subtests of the Test of Everyday Attention for Children (Tea-CH; Manly et al., 2001); ^k Selective/focussed attention measured by Sky Search and Map Mission subtests of Tea-CH; ^l Attentional control/switching measured by Creature Counting and Opposite Worlds subtests of Tea-CH; ^m Inattention measured by detectability, omissions, commissions, Hit reaction time (HRT) statistics, and variability measures in Conners’ Continuous Performance Test, 3rd edition (CCPT; Conners, 2015); ⁿ Impulsivity measured by commissions, perseverations, and HRT measures of CCPT; ^o Vigilance measured by HRT block change measure of CCPT; ^p Sustained attention measured by HRT block change measure of CCPT; MAAS, Mindful Attention and Awareness Scale (Brown and Ryan, 2003); YSR, Youth Self-Report (Achenbach, 1991a); CBCL, Child Behavior Checklist (Achenbach, 1991b); SHS, Subjective Happiness Scale (Lyubomirsky and Lepper, 1999); SCRS, Self Control Rating Scale (Kendall, 1979); CSBQ, Children’s Social Behavior Questionnaire (Luteijn et al., 2000); MAAS-A, Mindful Attention and Awareness Scale—Adolescent (Brown et al., 2011); PSWQ, Penn State Worry Questionnaire (Meyer et al., 1990); Ruminative Response Scale (Nolen-Hoeksema, 2000); WHO-5, World Health Organization-Five Wellbeing Index (Bech et al., 2003); SRS, Social Responsiveness Scale (Constantino and Gruber, 2005); AQ, Autism Questionnaire (Auyeung et al., 2008); RCADS, Revised Child Anxiety and Depression Scale (Chorpita et al., 2000); Conners, Conners 3rd Edition (Conners, 2008); SDQ, Strengths and Difficulties Questionnaire (Goodman, 1997); ECBI, Eyberg Child Behavior Inventory (Robinson et al., 1980); SWAN, Strengths and Weaknesses of ADHD Symptoms and Normal Behaviors Rating Scale (Swanson et al., 2012); CANT, Child Attention Network Test (Posner and Petersen, 1990); DCS, Dysregulation Coding System (Hoffman et al., 2006); ERC, Emotion Regulation Checklist (Shields and Cicchetti, 1997); SSIS, Social Skills Improvement System (Gresham and Elliott, 2008); IBQ-R, Infant Behavior Questionnaire-Revised, Very Short Form (Putnam et al., 2014); BDI-II, Beck Depression Inventory (Beck et al., 1996); SCS, Self Compassion Scale (Neff, 2015); EQD, Experiences Questionnaire (Fresco et al., 2007), Decentering subscale; CAMM, Children’s Acceptance and Awareness Measure (De Bruin et al., 2013); CSQ-CA, Chronic Stress Questionnaire for Children and Adolescents (De Bruin et al., 2017); CSRQ, Chronic Sleep Reduction Questionnaire (Meijer, 2008); DBDRS, Disruptive Behavior Disorder Rating Scale (Pelham et al., 1992); FFS, Flinders Fatigue Scale (Gradisar et al., 2007); BRIEF, Behavior Rating Inventory of Executive Function (Goia et al., 2000).

Exploratory moderator analyses were conducted in relation to both parenting stress and overall youth outcomes. For potential categorical moderators, a mixed effects model was used (random-effects within subgroups and fixed-effects across subgroups). The variance of true effect sizes across studies (T^2) was estimated by pooling within-group estimates of T^2 for each subgroup and applying the common estimate to all studies. This method of estimating T^2 is recommended by Borenstein et al. (2009) to increase the accuracy of the estimate, when the number of studies within any subgroup is low. Categorical moderators were tested only when there were four or more studies per subgroup (Fu et al., 2011). To test significance, the Q statistic was calculated between subgroups (Q_B). Random-effects meta-regression analyses were used to investigate the relationship between parent or youth outcomes and potential continuous moderators.

Risk of Bias in Individual Studies

A risk of bias assessment was conducted for each included study. Bias is defined as the tendency for study results to vary from those that would have been obtained from a well-designed and run RCT on the same participant group (Sterne et al., 2016). The domains assessed for potential bias were confounding (for non-randomized studies only), selection, misclassification, performance, attrition, detection and reporting bias. For RCTs, the Cochrane Risk of Bias tool for Randomized Controlled Trials (Higgins et al., 2011) was used to assess selection bias. However, for all other domains, the Cochrane Risk of Bias in Non-randomized Studies of Interventions (ROBINS-I) tool (Sterne et al., 2016) was used, as that tool appeared more suited to assessing studies of psychological interventions where blinding of participants, researchers and outcome assessments are not possible. For the non-randomized studies, the ROBINS-I tool was

used to assess all domains. All included studies were assessed for potential bias independently by both the first author and the graduate student who assisted with study selection. There was 94% agreement in bias ratings, with differences resolved by discussion.

RESULTS

Study Selection

Figure 1 shows the process of study selection and exclusion. The database searches identified 2,628 studies, 928 of which were duplicates. Forty-seven studies were retained after the title and abstract screening. Twenty-three of these studies were excluded based on the full text review, for the reasons set out in **Figure 1**. Of the 24 retained studies, three studies (Neece, 2014; Lewallen and Neece, 2015; Xu, 2017) appeared to be reporting data from an overlapping participant group. Confirmation was sought by email from the corresponding author but was not received. Lewallen and Neece (2015) and Xu (2017) reported on relevant outcomes that were not included in Neece (2014), but the outcome data for these two studies are reported in **Table 3** under Neece (2014), to reflect the apparent non-independence of the outcomes reported in these two studies. When the initial search conducted in August 2018 was updated in October 2018, five additional studies were identified by the first author. Two of these, Chan and Neece (2018) and Neece et al. (2018), also appeared to report data from a group of participants overlapping with those used in Neece (2014). As these two new studies and Neece (2014) all reported on parenting stress, the parenting stress outcomes from Chan and Neece (2018) and Neece et al. (2018) were not included in this review. The child outcome reported by Chan and Neece (2018) was not included in Neece (2014), so this child outcome is reported in **Table 3**, also under Neece (2014). However, the child outcomes reported in Neece et al. (2018) were also reported in Neece (2014), so this study was not included in this review. Accordingly, 25 independent studies are included in this review.

Study Characteristics

Twenty-five independent studies reported on the effects of a mindfulness intervention for parents. Eighteen studies delivered mindful parenting interventions, five studies delivered MBSR or Mindfulness-based Cognitive Therapy (MBCT) interventions specifically adapted for parents, and four studies (which appeared to use overlapping participant groups) delivered MBSR to parents. Where adaptations were made to standard MBSR or MBCT programs to reflect the fact that the participants were parents, these adaptations were minor. For example, trainers encouraged participants to reflect on how key concepts of mindfulness, such as acceptance and non-reactivity, might apply to their interactions with their children.

All studies delivered the intervention in a group format. Sixteen studies delivered the intervention to parents (including one mother/infant group), while nine delivered parallel mindfulness training to both parents and their children (parents and children in separate groups). In all studies, the majority of participating parents (between 55 and 100%) were mothers. In

relation to parental mental health, four studies involved parents referred for mental health treatment for their own mental health condition or parenting difficulties, while another six studies involved parents identified as being vulnerable to mental health difficulties due to socio-demographic factors or past psychiatric history, or who self-reported experiencing parenting stress. The remaining studies did not report on parental mental health status. In relation to youth mental health, the children of participating parents were identified as having mental health diagnoses or difficulties in 20 of the 25 studies. The mean age of children of participating parents ranged from 0.86 to 16.4 years, and 16 studies involved parents with children whose mean age was < 12 years.

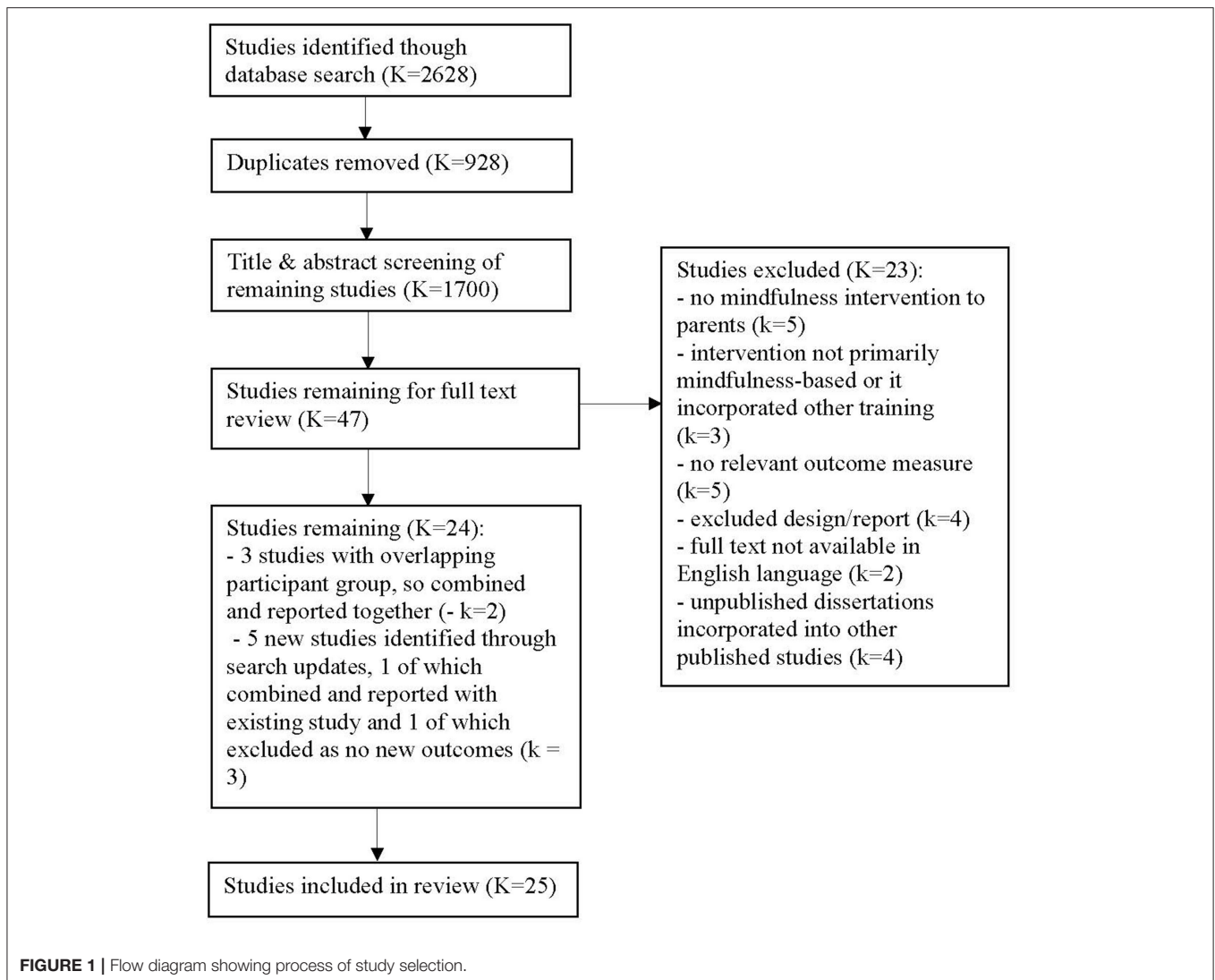
Sample sizes ranged from 11 to 180 participants. Of the 25 independent studies, 18 utilized a single group design and seven used a control group. Of the controlled trials, six were RCTs. Two RCTs used an active control group (skills-based parent training and parent education), while the remainder used passive controls such as waitlist or usual care groups. Individual session length ranged from 1.5 h (ten studies) to 3 h (three studies). Eight of the ten studies that delivered parallel parent and child interventions used the shorter 1.5 h sessions. The interventions were delivered over 6–12 weeks, and involved total hours of training between 9 and 27 h.

Parenting Stress

Within-Group Differences

Nineteen studies reported data enabling a quantitative analysis of within-group parenting stress. **Figure 2** shows the effect sizes for pre- to post-intervention change in parenting stress, with a summary Hedges' $g = 0.34$ ($p < 0.001$, 95% CI [0.23–0.45]). Heterogeneity was moderate to high ($Q = 66.96$, $p < 0.001$, $I^2 = 70\%$). **Figure 2** reports composite mother/father data for all studies where mothers and fathers participated. In the one study that reported mother and father outcomes separately, the authors found a significant, moderate to large reduction in parenting stress for fathers and a moderate but insignificant increase for mothers (van de Weijer-Bergsma et al., 2012). At first follow-up, which was generally 2 months post-intervention, the summary effect size for change in parenting stress was $g = 0.53$ ($p < 0.001$, 95% CI [0.45–0.61]) and heterogeneity was low ($Q = 6.62$, $p = 0.76$, $I^2 = 0\%$). The difference between pre-post and pre-follow up effect sizes was significant ($Q_B = 7.32$, $df = 1$, $p = 0.007$). Two studies also reported a 1-year post-intervention follow up. While no quantitative analysis was conducted for this time-point, the reported small to moderate reductions in parenting stress from pre-intervention remained significant [$d = 0.53$ in Potharst et al. (2017) and $d = 0.28$ in Ridderinkhof et al. (2017)].

Moderator analyses were conducted in relation to youth clinical status (clinical vs. non-clinical), youth age (child under 12 years vs. adolescent 12 years and over), and intervention groups (parent only mindfulness group vs. parallel parent and youth mindfulness groups). There were insufficient studies to conduct this analysis in respect of parent clinical status. No significant difference was found between the parenting stress effect sizes for parents attending a mindfulness program based on youth clinical status ($g = 0.33$, $p < 0.001$, 95% CI [0.19–0.48]) for clinical youth



and $g = 0.35$, $p < 0.001$, 95% CI [0.16–0.53] for non-clinical youth; $Q_B = 0.01$, $df = 1$, $p = 0.906$). Similarly, there was no difference in effects between parents of children ($g = 0.31$, $p < 0.001$, 95% CI [0.21–0.42]) and adolescents ($g = 0.21$, $p = 0.005$, 95% CI [0.06–0.35]) ($Q_B = 1.33$, $df = 1$, $p = 0.248$). However, the effect size for studies using parent-only intervention groups ($g = 0.35$, $p < 0.001$, 95% CI [0.24–0.46]) was greater than that for studies using parallel intervention groups ($g = 0.18$, $p = 0.001$, 95% CI [0.07–0.29]) ($Q_B = 4.37$, $df = 1$, $p = 0.036$). A meta-regression of total intervention hours on parenting stress effect size provided no evidence of a dose-response relationship between total hours spent in the mindfulness intervention and parenting stress ($\beta = 0.01$, $SE = 0.01$, $p = 0.26$).

Parenting stress was assessed by all studies as an outcome variable rather than as a potential mediator in the relationship between mindfulness in parenting and youth outcomes. One study (Haydicky et al., 2015) examined the direction of relationship between mindful parenting and parenting stress, by using cross-lagged panel correlations. Pre-test mindful parenting

scores were significantly negatively correlated with post-test parenting stress [$r_{(14)} = -0.52$, $p = 0.02$], but pre-test parenting stress was not significantly correlated with post-test mindful parenting [$r_{(14)} = -0.13$, $p = 0.311$].

Between-Group Differences

Five studies reported data enabling a comparison of post-intervention differences in parenting stress between mindfulness and control groups. The summary effect for the difference between these two groups indicated that the mindfulness groups experienced larger reductions in parenting stress than the control groups. This difference was of a small to moderate size ($g = 0.44$, $p = 0.005$, 95% CI [0.13–0.74]), with moderate heterogeneity ($Q = 8.11$, $p = 0.087$, $I^2 = 51\%$). Of these controlled studies, two compared a mindful parenting intervention with another active intervention. Ferraioli and Harris (2013) reported that mindful parenting resulted in a larger reduction in parenting stress than skills-based parent training ($d = 1.59$). Chaplin et al. (2018) reported that mindful parenting outperformed

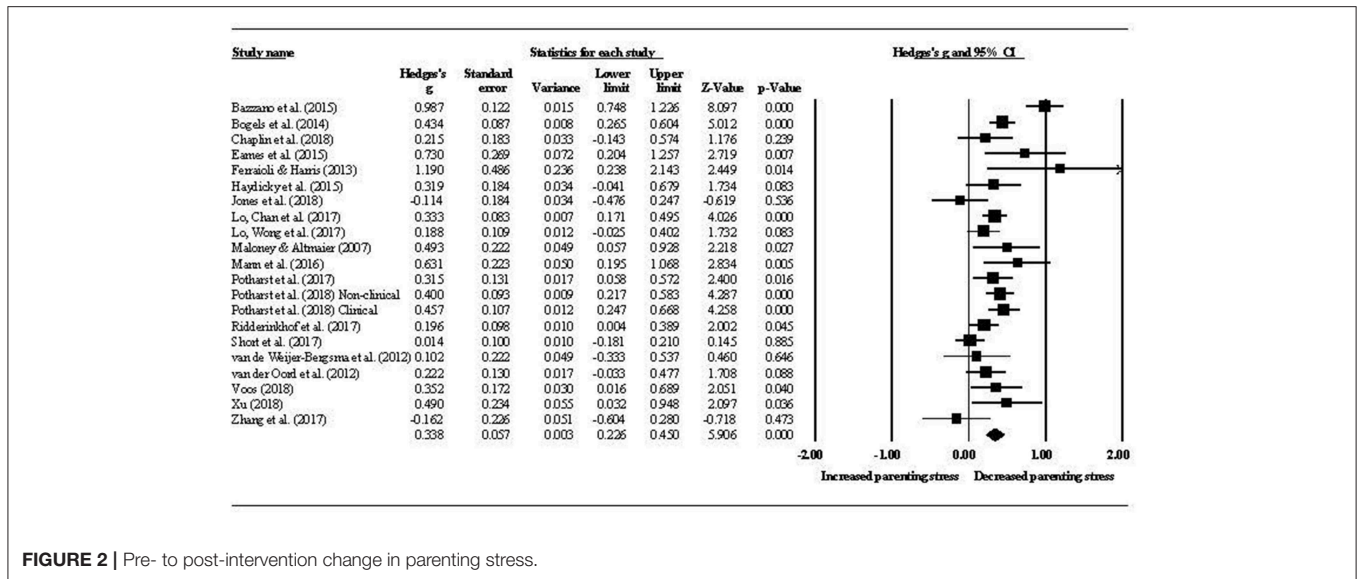


FIGURE 2 | Pre- to post-intervention change in parenting stress.

parent education, in two out of the three parenting stress domains measured ($d = 0.53$ and $d = 0.59$). Although not specifically about parenting stress, one study measured parents' heart rate variability and reported an effect of $d = 0.00$ for the comparison between the mindfulness and control groups (Lo et al., 2017b).

Youth Psychological Outcomes Within-Group Differences

The summary effect sizes for the youth internalizing, externalizing, cognitive, and social domains are presented in Table 4. Post-intervention effect sizes for each domain were small, and all were maintained at 2-month follow-up.

Figure 3 shows the effect sizes for overall youth outcomes. The summary effect size was $g = 0.27$ ($p < 0.001$, 95% CI [0.21–0.33]), with low to moderate heterogeneity ($Q = 23.06$, $p = 0.147$, $I^2 = 26%$). At 2-month follow-up, the summary effect was $g = 0.35$ ($p < 0.001$, 95% CI [0.27–0.42]), with low heterogeneity ($Q = 10.45$, $p = 0.402$, $I^2 = 4%$). There was no difference between pre-post and pre-follow up effects ($Q_B = 2.53$, $df = 1$, $p = 0.112$).

Despite the relatively low level of heterogeneity in youth outcome effects, moderator analyses were conducted in respect of youth age (child vs. adolescent) and intervention groups (parent only vs. parallel parent and youth groups). There were insufficient studies to conduct this analysis in respect of parent or youth clinical status. No differences were found in overall youth outcome effect sizes for children ($g = 0.26$, $p < 0.001$, 95% CI [0.20–0.33]) and adolescents ($g = 0.30$, $p = 0.001$, 95% CI [0.13–0.48]) ($Q_B = 0.17$, $df = 1$, $p = 0.682$) or for studies using parent only interventions ($g = 0.26$, $p < 0.001$, 95% CI [0.18–0.33]) and studies using parallel parent and youth interventions ($g = 0.31$, $p < 0.001$, 95% CI [0.21–0.41]) ($Q_B = 0.71$, $df = 1$, $p = 0.399$).

A meta-regression of total intervention hours on overall youth outcomes was conducted, but no evidence was found of a relationship between these two variables ($\beta = 0.00$, $SE = 0.00$, $p = 0.844$). For those studies reporting both parenting

stress and youth outcome data, a series of meta-regressions were conducted to examine whether change in parenting stress predicted youth outcome effect sizes. Change in parenting stress predicted change in both youth externalizing ($\beta = 0.48$, $SE = 0.21$, $p = 0.02$) and cognitive outcomes ($\beta = 1.13$, $SE = 0.56$, $p = 0.046$), but not internalizing outcomes ($\beta = -0.32$, $SE = 0.30$, $p = 0.282$). The same analysis was not performed for the social domain as there were too few studies. Figures 4, 5 show the relationships between change in parenting stress and externalizing outcomes, and change in parenting stress and internalizing outcomes, respectively.

Insufficient data was available for a quantitative analysis of youth mindfulness, but the effects reported by five studies for this variable (see Table 3) ranged from $d = -0.26$ to $d = 0.50$. A small number of studies included objective measures of youth outcomes, such as attention tests. In two studies, the effects obtained in the attention tests were broadly in line with those obtained from self-reports. For example, in Bögels et al. (2008), the youth-reported effect for attention problems was $d = 1.00$, then $d = 0.90$ at follow up, while the effect reported based on the D2 Attention Test was $d = 0.60$, rising to $d = 1.10$ at follow up. Similarly, in van de Weijer-Bergsma et al. (2012), the youth-reported effect for attention problems was $d = 0.50$, while the computerized sustained attention task effects ranged between $d = 0.20$ and $d = 0.40$. In Zhang et al. (2017), the effects reported for several aspects of attention were variable. For example, the effects in various subtests of sustained attention ranged from $d = -0.24$ to $d = 0.76$.

Only one study reported mother and father data on youth outcomes separately (van de Weijer-Bergsma et al., 2012), and two studies obtained teacher reports of youth outcomes (Lewallen and Neece, 2015, reported in Table 3 under Neece, 2014; van de Weijer-Bergsma et al., 2012). Teacher-reported effects were similar to parent-reported effects in van de Weijer-Bergsma et al. However, in Lewallen and Neece, teachers reported significant improvements in all seven of the social domains

TABLE 4 | Within-group effects for four youth outcome domains.

Outcome domain	Point of assessment	Sample		Effect size			Heterogeneity	
		K	n	Hedges' g	p-value	95% CI	I ²	p-value
Internalizing	Post-intervention	12	438	0.29	<0.001	0.21–0.36	22%	0.229
	Follow-up#	9	397	0.33	<0.001	0.22–0.44	46%	0.065
Externalizing	Post-intervention	14	621	0.26	<0.001	0.18–0.34	37%	0.079
	Follow-up	10	414	0.39	<0.001	0.31–0.47	7%	0.379
Cognitive	Post-intervention	7	231	0.27	0.001	0.11–0.42	52%	0.051
	Follow-up	5	144	0.40	<0.001	0.24–0.55	24%	0.263
Social [^]	Post-intervention	5	158	0.28	<0.001	0.14–0.43	25%	0.254

K, number of studies included in the effect size calculation; n, total number of participants in the studies included in the relevant domain; #, all follow up assessments are 2 months post-intervention, except for one study included in the Externalizing domain, which conducted follow-up 4 months post-intervention; [^], follow-up data were not analyzed for the Social outcomes domain, as only three studies reported follow-up social outcome data.

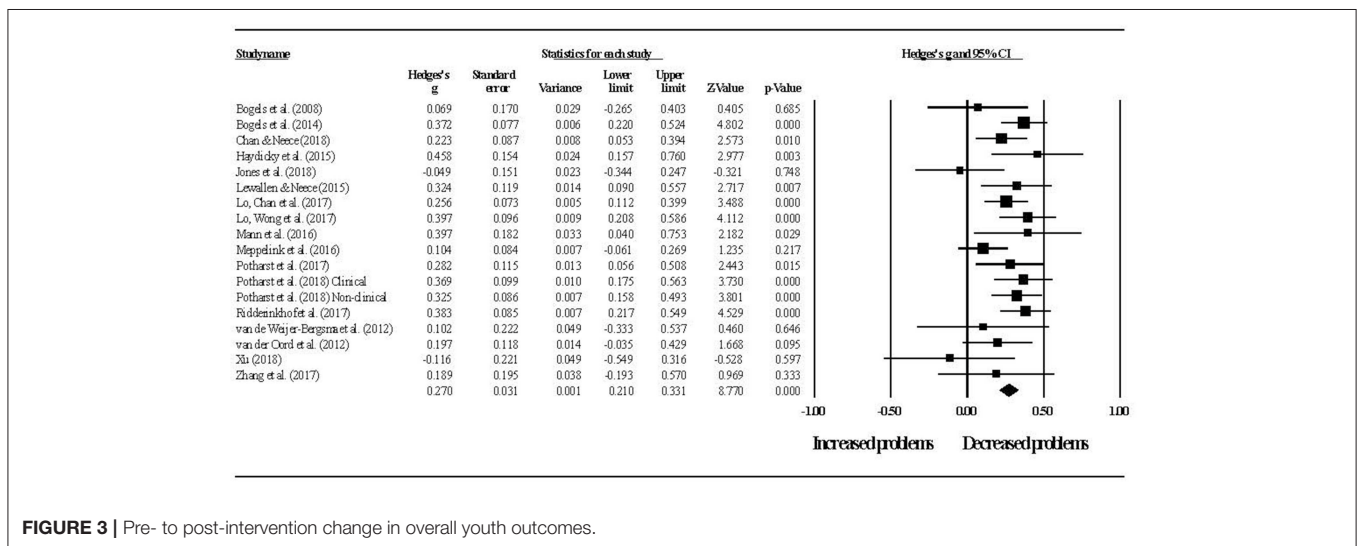


FIGURE 3 | Pre- to post-intervention change in overall youth outcomes.

measured, whereas parents reported significant improvements in only three domains.

Between-Group Differences

No quantitative comparison of the effectiveness of mindfulness interventions to control groups for youth outcomes was performed, as data required for this analysis was only available for three studies. However, of the studies that reported a between-group effect, the mindfulness group outperformed wait list for externalizing problems in two out of five studies [$d = 0.29$ in Lo et al. (2017b) and $d = 0.60$ in Mann et al. (2016)] and for internalizing problems in one out of three studies [$d = 0.46$ in Lo et al. (2017b)]. There were no studies comparing mindfulness with an active control, for youth psychological outcomes.

Publication Bias

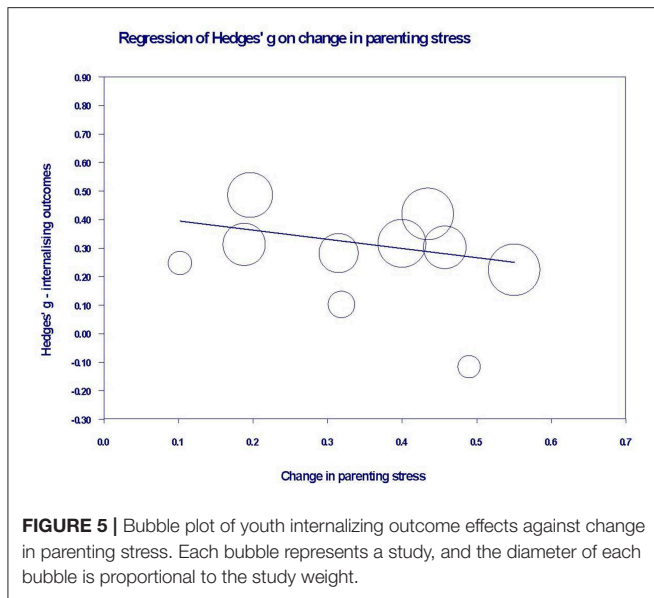
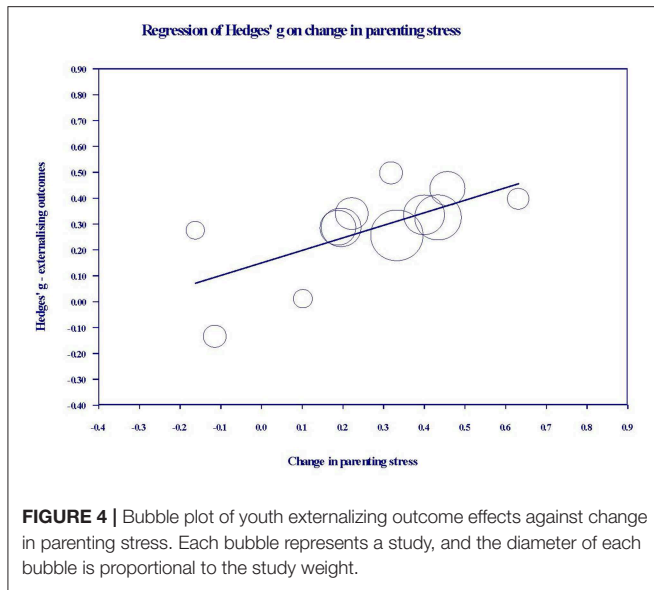
To assess the impact of any publication bias on the observed effects in this review, the trim and fill method (Duval and Tweedie, 2000) was used to give unbiased estimates of effect size. For within-group parenting stress, the imputed summary effect size was $g = 0.33$, which was equal to the observed summary

effect size of $g = 0.33$. As shown in **Figure 6**, the trim and fill analysis indicated that no studies were required to be trimmed in order for the funnel plot to be symmetric, that is for the impact of any publication bias to be removed. In relation to between-group parenting stress, the trim and fill analysis produced an imputed summary effect size of $g = 0.32$ (compared to the observed $g = 0.35$), with one study needing to fall on the left of the summary effect for plot symmetry. The impact of any publication bias in relation to parenting stress effects appears likely to be trivial.

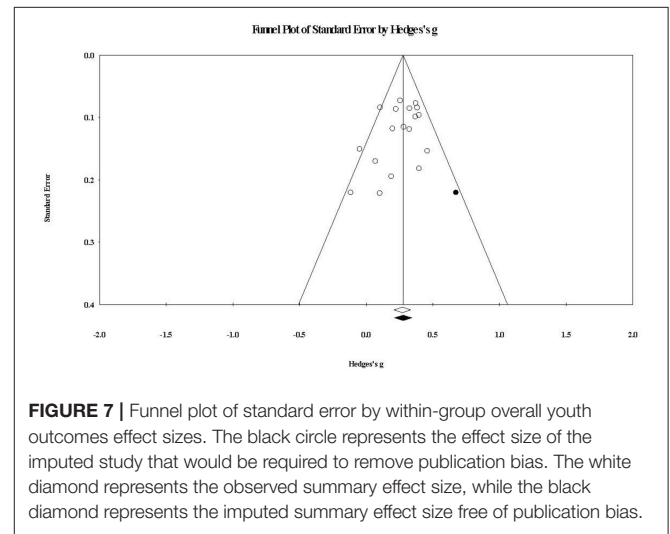
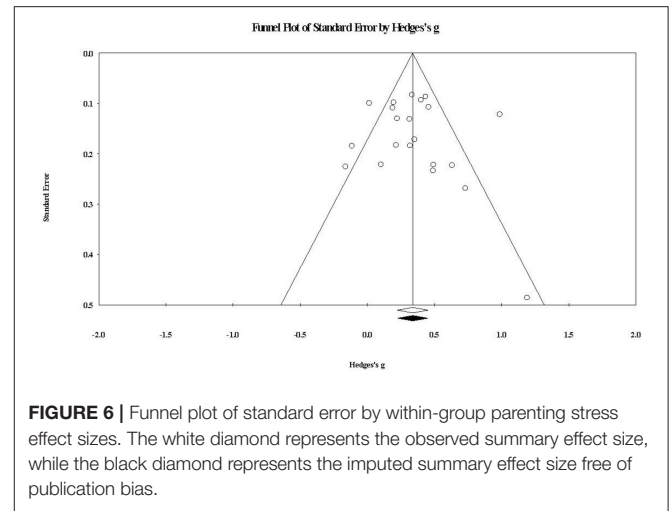
For within-group overall youth outcomes, the funnel plot at **Figure 7** shows that one study would need to fall on the right side of the observed summary effect for plot symmetry. The imputed effect size was $g = 0.281$ (compared to the observed $g = 0.276$), again suggesting a trivial impact of publication bias.

Assessment of Study Quality

Table 5 contains risk of bias assessments for each reviewed study. Overall, risk of bias was serious. For the non-randomized intervention studies, this was largely driven by the serious risk of confounding bias, which ROBINS-I notes may occur if



any prognostic variable also predicts the intervention received by a participant. Due to the lack of randomization, it is considered likely to be an issue for most if not all non-randomized studies (Sterne et al., 2016). For both non-randomized studies and RCTs, the majority of studies were considered at serious risk of detection bias because of the reliance on subjective self- or parent-about-youth outcome reports, which are considered reasonably vulnerable to the influence of knowledge about the intervention. Bias due to potential misclassification was an issue in many studies, as most reports did not state their pre-intervention position as to the minimum number of sessions a participant would need to attend to be considered as having completed the intervention. Bias may be introduced if the minimum number of sessions was changed



after the study commenced. Many studies also reported limited information regarding items such as session attendance rates of treatment completers, homework completion and instructor training, making it difficult to properly assess the risk of performance bias.

DISCUSSION

This review examined 25 independent studies of mindfulness interventions delivered to parents. We systematically evaluated the effectiveness of these interventions in reducing parenting stress and improving youth psychological outcomes. The results of the review show that mindfulness interventions for parents are associated with small to moderate immediate and maintained reductions in parenting stress. Reductions in parenting stress are greater for parents who attend mindfulness intervention groups than for those who attend control groups. Results also show that mindfulness interventions for parents are associated with small immediate and maintained improvements

TABLE 5 | Risk of bias assessment for reviewed studies.

Study	Confounding bias ^a	Selection bias ^b	Misclassification bias	Performance bias	Attrition bias	Detection bias	Reporting bias
Bazzano et al. (2015)	Serious	Low	Moderate	Unclear	Low	Serious	Moderate
Bögels et al. (2008)	Serious	Low	Moderate	Low	Low	Serious	Moderate
Bögels et al. (2014)	Serious	Low	Moderate	Low	Low	Serious	Moderate
Corthorn (2018)	Serious	Low	Unclear	Unclear	Moderate	Serious	Moderate
Chan and Neece (2018) [#]	–	Low	Unclear	Low	Low	Serious	Moderate
Chaplin et al. (2018) [#]	–	Unclear	Unclear	Unclear	Low	Serious	Moderate
De Bruin et al. (2015)	Serious	Low	Unclear	Low	Low	Serious	Moderate
Eames et al. (2015)	Serious	Low	Low	Unclear	Serious	Serious	Moderate
Ferraioli and Harris (2013) [#]	–	Unclear	Unclear	Low	Moderate	Serious	Moderate
Haydicky et al. (2015)	Serious	Low	Moderate	Low	Moderate	Serious	Moderate
Jones et al. (2018)	Serious	Low	Unclear	Unclear	Moderate	Serious	Moderate
Lewallen and Neece (2015)	Serious	Low	Unclear	Unclear	Moderate	Moderate	Moderate
Lo et al. (2017a) [#]	–	Unclear	Unclear	Low	Low	Serious	Moderate
Lo et al. (2017b) [#]	–	Low	Unclear	Low	Low	Moderate	Low
Maloney and Altmaier (2007)	Serious	Low	Unclear	Unclear	Unclear	Serious	Critical
Mann et al. (2016) [#]	–	Low	Moderate	Low	Moderate	Serious	Low
Meppelink et al. (2016)	Serious	Low	Unclear	Unclear	Moderate	Serious	Moderate
Neece (2014) [#]	–	Low	Unclear	Low	Low	Serious	Moderate
Potharst et al. (2017)	Serious	Low	Unclear	Low	Moderate	Serious	Moderate
Potharst et al. (2018)	Serious	Low	Moderate	Low	Moderate	Serious	Moderate
Racey et al. (2017)	Serious	Low	Moderate	Moderate	Critical	Critical	Moderate
Ridderinkhof et al. (2017)	Serious	Low	Unclear	Moderate	Moderate	Serious	Moderate
Short et al. (2017)	Serious	Low	Unclear	Moderate	Low	Serious	Moderate
van de Weijer-Bergsma et al. (2012)	Serious	Low	Unclear	Low	Moderate	Moderate	Serious
van der Oord et al. (2012)	Serious	Low	Low	Low	Low	Serious	Moderate
Voos (2017)	Serious	Low	Moderate	Unclear	Moderate	Serious	Moderate
Xu (2017)	Serious	Low	Unclear	Unclear	Serious	Serious	Moderate
Zhang et al. (2017)	Serious	Low	Unclear	Moderate	Low	Serious	Moderate

[#]RCT. For all RCTs in this table, the terms used to describe the level of bias have been changed from "Low," "High," and "Unclear" (used in the RoB tool), to "Low," "Moderate," "Serious," "Critical," and "Unclear," to reflect the terms and judgment guidelines used in ROBINS-I; ^anot relevant for RCTs; ^bFor RCTs, the assessment of selection bias asks (1) whether there was random sequence generation and (2) whether there was allocation concealment. In this table, only one risk assessment is reported for RCTs under this bias domain, as the level of risk assessed for these two aspects of selection bias was equal for each of the reviewed RCTs.

for youth across internalizing, externalizing, cognitive, and social domains of psychological functioning. Improvements in youth externalizing and cognitive outcomes are predicted by reductions in parenting stress, but no relationship was found between youth internalizing outcomes and parenting stress. There were insufficient studies to test the relationship between parenting stress and social outcomes.

Parenting Stress

For parenting stress, the small within-group reduction ($g = 0.34$) obtained immediately after intervention rose to a moderate reduction ($g = 0.53$) 2 months later. This suggests that the positive impact on parenting stress of the mindfulness intervention continued after the intervention ended. Two studies also measured parenting stress 1 year after the intervention, both reporting the maintenance of small to moderate reductions in parenting stress at that point. The five controlled studies reviewed showed that mindfulness interventions have a small to moderate

advantage ($g = 0.44$) over active and waitlist controls in reducing parenting stress. These results, together with the finding that pre-test mindful parenting scores are negatively correlated with post-test parenting stress, but not vice versa (Haydicky et al., 2015), provide initial evidence that mindfulness interventions for parents contribute to reduced parenting stress.

To place our findings regarding the parenting stress effect size into context, we sought to compare the current results against those obtained in other meta-analyses. We were unable to find meta-analyses of mindfulness or other interventions that aimed at lowering parenting stress specifically. However, Lundahl et al. (2006a) assessed parental emotional adjustment, which incorporated parenting stress. They reported a moderate within-group improvement in that outcome, in their review of parent programs to reduce child abuse. The post-intervention effect in that study ($d = 0.53$) was larger than in the present study ($g = 0.34$). This may have been because the measure of parental emotional adjustment included a number of negative emotional

states, such as anger, in addition to parenting stress. It is therefore possible that the effect size was driven by improvements in emotional states other than parenting stress.

We also sought to compare the advantage we found for mindfulness interventions over control groups to that found for other parent interventions. Again, we were unable to find any published meta-analyses concerning parenting stress as a stand-alone outcome. However, Lundahl et al. (2006b) reviewed the effects of parent training programs on a composite parenting outcome, which included parenting stress. Lundahl et al. (2006b) defined behavioral training programs as those teaching parents to reinforce their children's positive behavior and ignore or punish poor behavior. Non-behavioral programs were defined as those that did not teach these specific skills, and included programs aimed at improving parent-child communication or altering child-related cognitions. Based on this definition, mindfulness interventions are non-behavioral programs, and indeed the advantage over controls in the present study ($g = 0.44$) is similar to that found by Lundahl et al. (2006b) for non-behavioral parent programs ($d = 0.48$). The advantage of behavioral programs over controls was slightly larger ($d = 0.53$).

Interestingly, this review also found that the reduction in parenting stress was greater at follow up than post-intervention. This is in contrast to the pattern reported for behavioral parent training by Lee et al. (2012), who found a reduced effect at follow-up for a composite parenting outcome that included parenting stress. Similarly, the effects of cognitive behavioral therapy for general stress are maintained at follow up, but not increased (Hofmann et al., 2012). The present results suggest, therefore, that mindfulness interventions provide durable outcomes for parents, and compare favorably in this respect to behavioral parent training and cognitive behavioral therapy.

Heterogeneity in relation to parenting stress is moderate to high, indicating variance in the true effect size across studies. Possible reasons for this variability were tested through categorical moderator analyses and meta-regression. The reduction in parenting stress was not moderated by either youth age or clinical status, or the length of the mindfulness course. This suggests that parents acquire generic skills in mindfulness programs lasting from 9 to 27 h, that they are able to apply in various parenting environments, and across their child's development. In contrast, the reduction in parenting stress was greater when the intervention was delivered only to parents, than when it was delivered to parallel parent and youth groups. This result was surprising, since it is reasonable to expect that training both parents and their children in mindfulness would contribute to better outcomes, given the bi-directionality of parent and child factors (Branje et al., 2010; Neece, 2014). To investigate this result further, the characteristics of the two subgroups were checked. Of the six studies in the parallel interventions subgroup, five involved youth diagnosed with ADHD. However, amongst the 15 studies in the parent-only intervention subgroup, only three involved parents whose children had been diagnosed with ADHD. Further, these three studies reported only 47, 31, and 7% of the parents' children as having ADHD. While no conclusion can be drawn, it is possible that the smaller reduction in parenting stress amongst parents in the parallel intervention subgroup is

related to their child's diagnosis of ADHD, rather than the fact that both parents and their children received the intervention.

Youth Outcomes

The results of our review show that mindfulness interventions for parents are associated with improved youth outcomes. The summary effects indicate small, within-group improvements in internalizing ($g = 0.29$), externalizing ($g = 0.26$), cognitive ($g = 0.27$), and social ($g = 0.28$) domains. These improvements are maintained after 2 months for the internalizing ($g = 0.33$), externalizing ($g = 0.39$), and cognitive ($g = 0.40$) domains. There were insufficient studies to conduct a follow-up analysis for the social domain. There were also insufficient controlled studies to conduct a quantitative comparison of intervention groups with controls, for any of the youth outcomes. The results reported by the few studies that included a control group are mixed, with mindfulness groups outperforming waitlist controls in some studies but not others, for both internalizing and externalizing outcomes.

This is the first published meta-analysis regarding the effectiveness of mindfulness interventions for parents in improving youth outcomes. There are, therefore, no equivalent studies to compare the effects found in the present review against. A review of mindfulness interventions delivered to children and adolescents in schools found within-group effects for emotional problems and cognitive performance of $g = 0.31$ and $g = 0.68$, respectively (Zenner et al., 2014). It is possible that the effects reported in that study were larger than those in the present review because the interventions were delivered directly to the children and adolescents, rather than to parents. Looking at other parent-focused interventions, a meta-meta-analysis of studies for treating youth with externalizing disorders obtained effects for youth outcomes (externalizing and internalizing problems combined) of $d = 0.46$ post-intervention and $d = 0.49$ at follow-up (Mingebach et al., 2018). The larger improvements found in that review may reflect the fact that the majority of reviewed studies involved behavioral parent training interventions. Mindfulness interventions for parents appear, therefore, to be associated with smaller improvements in youth outcomes than either behavioral parent training or mindfulness interventions for youth.

Heterogeneity in connection with youth outcomes is low to moderate. Mindfulness interventions for parents are associated with equally beneficial outcomes for children and adolescents, whether they attend mindfulness training in parallel with their parents or not, and regardless of the length of the mindfulness course. These results together suggest that even shorter mindfulness programs can result in changes to parental functioning that are positive for youth of any age. Meta-regressions were conducted to check whether change in parenting stress predicted youth outcomes. Greater reductions in parenting stress did predict greater improvements in youth externalizing and cognitive outcomes. This finding is consistent with previous studies showing that parenting stress is related to harsh, over-reactive parenting (Venta et al., 2016), and that harsh parenting predicts later youth behavior problems and poorer attentional regulation (Eisenberg et al., 1999; Rominov et al.,

2016). Therefore, reductions in parenting stress may improve externalizing and cognitive outcomes.

Unlike externalizing and cognitive outcomes, reductions in parenting stress did not predict improvements in youth internalizing outcomes. There are a number of possible explanations for this. While youth externalizing problems can be aversive to parents and contribute to higher parenting stress (Eisenberg et al., 1999; Neece et al., 2012), youth internalizing problems tend to be subtle and non-aversive (Eisenberg et al., 1999). Accordingly, it is possible that parents of youth with internalizing problems have a lower baseline level of parenting stress than do parents of youth with externalizing problems. In this case, we would expect a mindfulness intervention for parents of youth with internalizing problems to have less of an impact on parenting stress. Any relationship between change in parenting stress and change in internalizing problems may therefore be too small to detect. Mindfulness interventions for parents could also affect youth internalizing outcomes through a pathway other than parenting stress. For example, greater parental warmth and acceptance toward children are associated with lower youth internalizing problems (Yap and Jorm, 2015). As mindful parenting involves compassion, emotional warmth, and non-judgmental acceptance toward a child (Duncan et al., 2009, 2015), mindfulness interventions may improve internalizing outcomes by promoting these attitudes in parents. Internalizing problems are also associated with difficulties with emotion regulation (Suveg and Zeman, 2004). For example, greater use by parents of adaptive emotion regulation strategies, such as cognitive reappraisal, are associated with lower youth anxiety (Wald et al., 2018). Since mindful parenting is also associated with greater parental self-regulation (Duncan et al., 2009; Ridderinkhof et al., 2017), mindfulness interventions could reduce youth internalizing problems by facilitating healthier forms of emotional regulation in parents.

Methodological Limitations

There are several limitations affecting the strength of the evidence provided by both this review and the individual studies reviewed. At the review level, the number of studies available for inclusion is still small. For this reason, we treated studies of mindful parenting interventions and studies of other mindfulness-based interventions delivered to parents as a single group. However, it is not currently known whether these two types of mindfulness intervention have different outcomes for parents or youth, or whether they exert their effects through different pathways. The number of available studies also had implications for testing potential moderators, such as parent clinical status. It may also have affected our ability to detect significant moderators and covariates. For example, although we found no relationship between the length of the mindfulness course and either parenting stress or youth outcomes, some other meta-analyses have found dose-response relationships for a range of outcomes (Khoury et al., 2013; Zenner et al., 2014; cf. Vollestad et al., 2012). In general, due to the relatively small number of studies in this review, some caution should be applied to the interpretation of the moderator and meta-regression analyses. As more research is published on mindfulness interventions

for parents, future reviews with greater power will provide more accurate information regarding significant moderators or covariates.

At the individual study level, small sample sizes are likely to have contributed to a lack of statistical power to detect significant effects in a number of studies. A scan of **Tables 2, 3** reveals several moderate to large effects, both post-intervention and at follow-up, that are reported as non-significant. The availability of small samples may have been a reason for the single group design used in most of the reviewed studies. Due to the lack of randomization to intervention or control groups, we cannot conclude that the reported effects are caused by the mindfulness intervention. This is particularly the case for the various outcomes (anxiety, depression, well-being, rumination, and executive functioning) that significantly improved at follow up, but not immediately post-intervention. This longer term effect is consistent with the self-sustaining change proposed to be the result of mindfulness practice (Dumas, 2005). However, childhood is an ongoing period of development in which changes may occur in various domains of functioning over time, for many reasons. When more time has passed, it is more likely that extraneous variables may have contributed to changes in outcomes, making the causal link between the intervention and the effect more tenuous.

All studies were judged to have at least a serious risk of bias. Whilst this was partly due to the lack of randomization noted above, the subjective reporting of most outcomes in each study was also an issue. In the context of mindfulness interventions, which parents must invest a significant amount of time and effort to attend, relying on parent reports may increase the risk of detection bias. Although it is difficult to address this issue in studies in which many outcomes must be subjectively reported, obtaining reports from different sources, such as mothers, fathers, youth and teachers, and obtaining objective measures if possible, may give a more complete picture. For example, Lewallen and Neece (2015) found that teachers reported significant improvements in more social domains than parents did. This suggests that youth outcomes may differ across contexts. Similarly, the differences between mothers and fathers in post-intervention parenting stress (van de Weijer-Bergsma et al., 2012) might indicate a systematic difference in how mothers and fathers respond to a mindfulness intervention. Finally, assessment of treatment adherence and integrity was problematic in many studies, as limited information was reported regarding session attendance rates, homework completion or instructor training. Lack of detailed implementation-related data appears to be a common issue in connection with mindfulness interventions (Vollestad et al., 2012; Zou et al., 2018).

Future Directions

The results of this review show that further research on mindfulness interventions for parents is desirable. Future studies are needed to address the methodological limitations identified above. For example, there is evidence that variables such as therapist experience with mindfulness (Khoury et al., 2013), amount of home practice (Parsons et al., 2017) and total time of mindfulness training (Zenner et al., 2014) can moderate outcomes. Inclusion of more information on these

variables would allow reviewers to investigate more potential moderators. In addition, randomizing participants to control and intervention groups would allow firmer conclusions to be drawn about whether mindfulness in parenting played a causal role in relevant outcomes.

Use of randomized controlled studies would also allow comparisons to be made between mindfulness interventions and other active interventions such as behavioral parent training. For youth with externalizing problems, behavioral parent training is an effective and widely used intervention (Dretzke et al., 2009). However, some parents, such as those with their own psychopathology, benefit less from behavioral parent training than others (Maliken and Katz, 2013). This may be because these parents find it difficult to apply new parenting skills in stressful situations with their child and revert to old patterns of responding in those situations (Siegel and Hartzell, 2004). Given its focus upon reducing parenting stress, mindfulness-based interventions might be of greater benefit to these families than behavioral parent training.

The majority of studies involved parents with children under 12 years, or parents managing youth externalizing problems. Very few studies included parents of youth with internalizing problems. It is therefore recommended that additional research be done in community samples or in clinical samples of families experiencing youth internalizing problems. As no relationship was found between parenting stress and youth internalizing outcomes, research with these samples could investigate whether mindfulness in parenting is associated with potential mediators other than parenting stress. These could include parental factors known to be associated with youth internalizing problems. Finally, relatively few studies examined outcomes for families with adolescents and only one of these (Corthorn, 2018) included parents of adolescents without a clinical diagnosis. Adolescence is associated with increased negative affect (Kim et al., 2001) and conflict (Laursen et al., 1998), and may be a time of potentially

stressful change in the parent-child relationship (Duncan et al., 2009). Importantly, it is also a time when many psychological disorders are first diagnosed (Copeland et al., 2009). Research could usefully address the question of whether mindfulness interventions for parents of adolescents are effective as a preventive intervention for adolescent psychological problems.

CONCLUSION

The results of the present review show that mindfulness interventions for parents are associated with reduced parenting stress for parents of both children and adolescents. They are also associated with improved youth psychological functioning across internalizing, externalizing, cognitive, and social domains. Reduced parenting stress predicts improvement in youth externalizing and cognitive outcomes, but not youth internalizing outcomes. Methodological weaknesses in the available literature prevent firm conclusions from being drawn regarding the causal role of mindfulness training for parents in relation to each of these outcomes. Further research is recommended to address limitations in the current literature and questions raised by this review.

AUTHOR CONTRIBUTIONS

VB designed and conducted the review and meta-analysis and wrote the manuscript. MS and MA reviewed the design and collaborated on editing the manuscript.

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The Role of Compassion and Mindfulness in Building Parental Resilience When Caring for Children With Chronic Conditions: A Conceptual Model

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Compassion- and mindfulness-based interventions (CMBIs) and therapies hold promise to support parent resilience by enabling adaptive stress appraisal and coping, mindful parenting, and perhaps crucially, self-compassion. These contemplative modalities have recently been expanded to parents of children with chronic illness, building on successful applications for adults facing stress, chronic pain, or mental illness, and for healthcare professionals in response to caregiver burnout resulting from their work. The design and adaptation of interventions and therapies require a conceptual model of parent resilience in the context of childhood chronic illness that integrates mindfulness and compassion. The objective of this paper is to propose and describe such a model. First, we review the need for parent support interventions for this population. Second, we introduce a Model of Compassion, Mindfulness, and Resilience in Parental Caregiving. We highlight the mindful parenting approaches, guiding theories for adaptive coping, and family resilience frameworks that informed our model. Third, we describe a case of a parent to illustrate a practical application model. Finally, we outline future directions for intervention development and research to examine the impact of CMBIs on parent resilience.

Keywords: parent, compassion, mindfulness, children with illness/disability, conceptual model, self-compassion, family resilience

INTRODUCTION

A common sentiment is that parenting can be the greatest gift and the greatest burden. This may be especially apt for parents or other caregivers (hereafter described as parents) who are faced with the challenges of caring for a child with a chronic condition, a situation that most families are not likely to anticipate (Myers et al., 2009). Most parents can respond appropriately or skillfully to a short-term childhood health challenge. Vaccinations, chicken pox, stitches, or a broken arm are common experiences and most children recover quickly. With a childhood illness or disability, the picture can be drastically different. Significant parent involvement is often required

in daily health-related monitoring or tasks when caring for a child with a chronic condition. In addition to this unexpected burden, parents may face worries about their child's health and well-being, the loss of certain hopes or dreams for their child's present and future life, and social isolation because their daily life and experiences are markedly different from other families.

In this context, compassion- and mindfulness-based interventions (CMBIs) hold promise in augmenting parent resilience, which is defined by Rolland and Walsh "as the ability to withstand and rebound from disruptive life challenges, becoming strengthened and more resourceful. Not simply general strengths, resilience involves the dynamic processes that foster positive adaptation in the context of significant adversity" (Rolland and Walsh, 2006). In their analysis of resilience in families of children with chronic illness, they argue that resilience is not just "bouncing back" as popularly defined, but importantly that it "involves struggling, effectively working through and learning from adversity, and integrating the experience into the fabric of individual and shared lives." Similar to post-traumatic growth, which is defined as a person's experiences of positive life changes of a traumatic event (Calhoun and Tedeschi, 2006), parents may also experience positive outcomes alongside the suffering and stress of caregiving (Hungerbuehler et al., 2011; Picoraro et al., 2014; Khu et al., 2019). As we will explore in our model, both mindfulness and compassion have significant potential to support this process of working through adversity and finding ways to develop inner resources to cultivate acceptance, find meaning in the context of complex parenting challenges, and respond to the child and oneself with kindness in the face of persistent stressors associated with children's chronic conditions.

The Parenting Burden Associated With Childhood Illness

While chronic conditions have been defined and categorized in many ways in the medical literature, there is a common denominator of parental stress and burden across chronic conditions. For the purpose of conceptualizing the role of mindfulness and compassion in building the resilience of parents of children with chronic conditions, we therefore use the broad definition from the National Survey of Children with Special Health Care Needs in the United States (U.S.), which encompasses any condition that has lasted or is expected to last for at least 12 months (Bethell et al., 2015), including mental and behavioral health conditions (e.g., autism or depression), medical conditions (e.g., sickle cell disease), and physical or intellectual disabilities (e.g., cerebral palsy or Down syndrome). An estimated 19.8% of U.S. children have a chronic condition according to national surveys using this definition (Bethell et al., 2014). An estimated 14% of U.S. children have an emotional, mental, or behavioral condition; this prevalence increases to 17.6% in families living in severe poverty, indicating an important disparity (Bethell et al., 2014, 2016). Globally, a meta-analysis of data from 27 countries indicated a pooled estimate of 13.4% of children and adolescents with any mental disorder (Polanczyk et al., 2015). According to a systematic review, one in four children is estimated to experience a chronic pain episode lasting 3 months or more (King et al., 2011).

The association between child chronic conditions and high parent stress is well documented. In a meta-analysis comparing caregivers of children with chronic illness to other caregivers, those who had a child with a chronic illness (asthma, cancer, cystic fibrosis, diabetes, epilepsy, juvenile rheumatoid arthritis and sickle cell disease) reported significantly greater parenting stress, which was associated with greater parent responsibility for managing treatment and poorer psychological adjustment in both caregivers and children (Cousino and Hazen, 2013). Nationally representative studies from multiple countries have documented poor mental and physical health among parents of children with chronic health conditions, activity limitations, and disabilities (Emerson and Llewellyn, 2008; Brehaut et al., 2009; Witt et al., 2009; Yamaoka et al., 2016). Research has also documented lower health-related quality of life (HRQOL), significant stress, post-traumatic stress symptoms, and fears related to a child's survival (Landolt et al., 2005; Rodriguez et al., 2012; McGrath-Morrow et al., 2013; Guyard et al., 2017).

Link Between Parent and Child Well-Being

The health and well-being of both parents and their children can be deeply affected by the challenges posed by chronic illness or disability, especially when families cannot engage in normative activities. Some evidence suggests that child health is associated with the physical and mental health of their parents. For example, studies among children with specific conditions have documented an association between poor caregiver mental health and child health symptoms or quality of life for children with asthma (Martinez et al., 2009; Verkleij et al., 2015), type 1 diabetes (Carcone et al., 2012) and cerebral palsy (Turkoglu et al., 2016). Although directionality of the relationship is unclear in such studies, there is some evidence of a bidirectional relationship between mother and child health. For example, a nationally representative U.S. study found direct effects of child activity limitations on maternal activity limitations 2 years later; the inverse was also true (Garbarski, 2014).

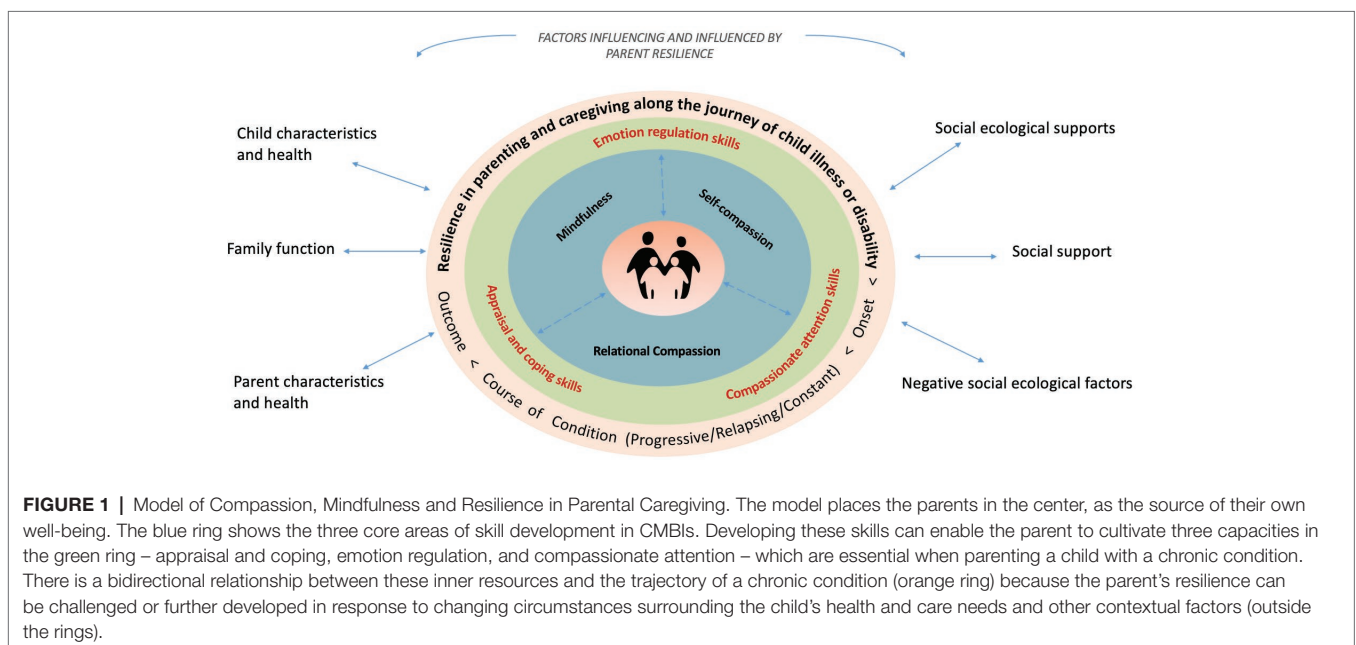
Moreover, in the field of behavioral epigenetics, there is emerging evidence that exposure to chronic stress results in enduring physiological sequelae across generations. Studies suggest that parental stress and their history of childhood adversity influence DNA methylation in their children (Berens et al., 2017; Barker et al., 2018). In addition, exposure to non-supportive parenting (high conflict, low warmth and emotion support) at age 17 is predictive of diminished telomere length 5 years later (Brody et al., 2015). Although larger studies are needed to confirm these findings about telomere activity, it is possible that the exposure of children with chronic conditions to their parents' stress could translate into an impact on children's health and longevity. No matter the age, an individual's health and resilience are influenced by both modifiable and unmodifiable factors, including genetic factors, persistence of stressors, learned patterns of coping and appraisal, and access to support (Schneiderman et al., 2005). These findings point to the critical need for interventions to support not just children but the whole family. Interventions designed for parents could therefore impact not only the parent's mental health and well-being but also child outcomes.

The Need for Compassion- and Mindfulness-Based Interventions

Parents of a child with a chronic condition may face the challenge of needing to call upon their own compassion to respond to their child's needs while their own emotional reserves are depleted. Parents may face significant worries about their child's well-being, suffer when they see their child in distress or struggling, and feel taxed by the constant demands of caregiving. The need to support these parents is well recognized and a variety of interventions addressing modifiable factors have been studied. A Cochrane review of psychological interventions for parents of children and adolescents with chronic illness found that cognitive behavioral therapy (CBT) for parents can improve the child's symptom reporting for painful conditions; and CBT and problem-solving therapy can improve parent mental health (Eccleston et al., 2015). A meta-analysis on coping support interventions during hospitalizations found reductions in parent anxiety and stress but not depression (Doupnik et al., 2017). Generally, interventions for parents of children with developmental disabilities focus on improving child behavior or teaching positive parenting with the primary outcome of improving child behavior and secondary outcomes of improving parental adjustment, parenting satisfaction and efficacy, and parental relationship (Tellegen and Sanders, 2013; Skotarczak and Lee, 2015). In a similar vein, many interventions aim to increase parents' medical knowledge or skills related to *treatment adherence* in efforts to improve child outcomes rather than focusing on *parent adjustment*, coping styles, or parenting behaviors (Crandell et al., 2018). However, none of these reviews included compassion- and mindfulness-based interventions (CMBIs) and to our knowledge only a handful of CMBIs have been tested with parents of children with chronic conditions.

Whereas mindfulness interventions are increasingly offered in various settings, compassion-oriented interventions are relatively

new and emphasize compassion in relation to the world and oneself in the face of struggle and suffering. Compassion-oriented interventions include Acceptance and Commitment Theory (ACT), Compassion Cultivation Training (CCT), Cognitively-based Compassion Training (CBCT), Mindfulness-based Compassionate Living (MBCL), and Mindful-Self Compassion (MSC), among others (Hayes et al., 2006; Pace et al., 2009, 2013; Jazaieri et al., 2013, 2017; Neff and Germer, 2013; Schuling et al., 2016). Our approach emphasizes relational compassion and self-compassion as we believe that cultivation of safety, connection, and caring is essential in any CMBI or therapy created to support parents when caring for a child with a chronic condition. Compassion for others is typically defined as a feeling of concern for the suffering of another person, coupled with the desire to alleviate that suffering (Goetz et al., 2010). Compassion for oneself involves directing caring and kindness to one's own distress. According to Neff, self-compassion has three components: mindfulness (being aware of one's painful experiences in a balanced way), self-kindness (being caring toward oneself), and common humanity (recognizing and understanding that pain and suffering are universal and part of the shared human experience) (Neff, 2003). Compassion interventions also aim to reduce social isolation by increasing a capacity for connection, which is much needed considering the loneliness reported by this parent population (Coke et al., 2013; Neff and Faso, 2014). Perceived social support, an aspect of compassionate behavior, is a potent buffer for stress on health outcomes (Reblin and Uchino, 2008; Seppala et al., 2013; Del-Pino-Casado et al., 2018). While there is relatively little research on the impact of compassion training for parents or other informal caregivers of children and adolescents, the application of these interventions for parents is worthy of study because they appear to reduce burnout in formal caregivers (Jazaieri et al., 2013; Boellinghaus et al., 2014; Raab, 2014; Scarlet et al., 2017).



A New Model of Compassion, Mindfulness, and Resilience in Parental Caregiving

In this context, we propose a holistic Model of Compassion, Mindfulness, and Resilience in Parental Caregiving with the goal of informing how clinicians can support this unique population of parents and how interventions can be developed and evaluated (Figure 1). Our proposed model demonstrates the potential for mindfulness and compassion to foster awareness of the human responses to caring and suffering, acceptance of parental limitations, cultivation of self-care and meaningful experiences of connection with others. CMBIs can thereby enable parents to harness their inner resources for their continued resilience and growth, which is foundational for family well-being in the context of managing childhood chronic conditions. Specifically, CMBIs could enable parents to adopt skillful means and better sustain themselves during the arduous and ongoing tasks of caregiving, engage in mindful parenting, more effectively respond to stressors, and confidently advocate for services.

COMPASSION AND MINDFULNESS IN PARENTING

CMBIs focus on three areas of skill development: mindfulness, relational compassion, and self-compassion. These skills, in turn, support the development of capacities that are necessary for parents facing long-term caregiving challenges with a significant impact on daily life.

Mindfulness Skills

Our model draws on Kabat-Zinn's definition of mindfulness as "paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally" (Kabat-Zinn, 1994). Among CMBIs, the study of mindfulness-based interventions has received wide attention especially in helping people manage chronic health conditions and mental distress, such as anxiety and depression (Williams and Kabat-Zinn, 2013). There is a robust evidence base for the feasibility and efficacy of mindfulness-based interventions in improving well-being in adult populations (Fjorback et al., 2011; Hilton et al., 2017; Blanck et al., 2018), as well as children and adolescents (Black et al., 2009; Khoury et al., 2013; Black, 2015; Zoogman et al., 2015; Chi et al., 2018). Twenty years ago, the concept of *mindful parenting* was introduced by Jon and Myla Kabat-Zinn as an alternative to traditional discipline-oriented methods by focusing on the quality of a parent's presence in the parent-child dyad (Kabat-Zinn and Kabat-Zinn, 1998). Mindful parenting interventions typically focus on cultivating mindfulness and attunement with the parent's inner experience while interacting with child and feeling the full range of emotions related to parenting. As such, mindful parenting involves cultivating nonjudgmental awareness of the unfolding of internal and external experiences in daily life; practicing emotion regulation skills; learning about adaptive responses to distress; and developing a self-compassionate attitude toward one's fallibility, limitations, and suffering (Duncan et al., 2009;

Bögels et al., 2010). According to Bögels and colleagues, the hypotheses of mindful parenting interventions are that mindfulness training could reduce parental stress, emotional reactivity, parental preoccupation with negative interactions with child, and maladaptive parental dynamics, and improve self-care, parenting skills, attunement to child, and marital function (Bögels et al., 2010). Development of these skills may foster family resilience when managing the daily tasks involved in caring for children with a chronic condition, facing worries about uncertainty in a child's prognosis, responding to challenging behaviors, navigating competing demands of siblings and family members, and facing stigma and social isolation.

Relational Compassion Skills

In our model, relational compassion involves responding with kindness and a desire to relieve the suffering of the child, other family members, and those in the community surrounding the family. In the context of parenting, relational compassion may be expressed as a parent's skillful responses to their child, especially toward experiences that evoke distress, empathy fatigue, shame, and self-criticism when facing daily caregiving challenges. Practicing compassion-focused skills may require simultaneously drawing on one's ability to be present for the child while responding to the child's needs or suffering, which can be difficult to do in the moment. Compassion skills may include a recognition of somatic experiences, a focus on breath and calming techniques, and calling on variety of compassion visualizations or meditative practices, such as loving-kindness meditation or imagining a taking away a child's pain or suffering and offering warmth and joy (Jazaieri et al., 2013). Two mindful parenting models highlight the parallel processes of the parent's attention to their own experience through mindfulness and the parents' attention to their child through relational compassion skills. Duncan et al. introduced a framework for mindful parenting with five relational dimensions that has greatly influenced the expansion of mindful parenting into family approaches (Duncan et al., 2009). These dimensions include listening with full attention; nonjudgmental acceptance of self and child; emotional awareness of self and child; self-regulation in the parenting relationship; and compassion for self and child. In a randomized controlled effectiveness study examining the efficacy of an evidenced-based program modified to incorporate mindful parenting compared to the original evidence-based parenting program, participants in the mindful parenting arm had outcomes that were comparable to the original evidence-based program in the domains of interpersonal mindfulness in parenting, parent-youth relationship quality, and parental well-being (Coatsworth et al., 2015). There was a stronger effect for fathers in the mindful parenting arm with respect to interpersonal mindfulness in parenting and relationship quality. In addition, the results from a 1-year follow-up showed that the mindfulness-enhanced program might have greater sustainability of intervention effects on mothers' ability to monitor their youth. These findings suggest that parents can learn new mindful parenting skills, and potentially over time, enhance natural abilities of awareness, emotion regulation, and dispositional mindfulness in relationship to their children.

Self-Compassion Skills

In our model, we conceptualize self-compassion as turning toward suffering with an attitude of kindness, compassion, and acceptance, in the same way one might direct care and tenderness toward a loved one or a friend in need, as described by Neff (Neff, 2003). Self-compassion practices also foster an understanding that humans are not alone in their suffering, potentially reducing isolation (Neff, 2003). MSC and Compassionate Mind Training (CMT) are group-based interventions to help people become more self-compassionate (Gilbert and Proctor, 2006; Neff and Germer, 2013). Self-compassion may also be an effective coping strategy to life's stressors (Allen and Leary, 2010) and has been linked to increased well-being and adaptive coping (MacBeth and Gumley, 2012; Friis et al., 2016; Homan and Sirois, 2017). In the context of family challenges, a parent can form compassionate responses to the caregiving burden as it arises within the self, whether the suffering may be in response to one's child, within oneself, or in witnessing other families experiencing similar challenges. Parents of children with autism who have greater self-compassion reported greater life satisfaction and hope and less depression and parental stress (Neff and Faso, 2014). An association has also been found between greater self-compassion and lower levels of stress and depression among parents of adults with intellectual or developmental disability (Robinson et al., 2018). CMBIs may increase acceptance of experiences of guilt, resentment, and fatigue related to prolonged caregiving, particularly when such interventions include a focus on self-compassion and normalize caregiving challenges through the sharing of experiences in group interventions.

In summary, mindfulness, relational compassion, and self-compassion represent the core skillsets of the conceptual model and are promising areas for intervention development and evaluation. Although CMBI studies with parents of children with chronic conditions are just emerging and use a variety of approaches, there are consistent positive outcomes among parents of children with autism, developmental delay, attention deficit hyperactivity disorder (ADHD), mental health diagnoses, chronic pain, inflammatory bowel disease, and other chronic conditions (Minor et al., 2006; Benn et al., 2012; van der Oord et al., 2012; Bazzano et al., 2013; Bogels et al., 2014; Dykens et al., 2014; Neece, 2014; de Bruin et al., 2015; Meppelink et al., 2016; Ridderinkhof et al., 2018; Ruskin et al., 2018). Well-being outcomes for parents include greater self-compassion, mindfulness, psychological well-being, psychological flexibility, physical health, life satisfaction, or competence in parenting, and lower parenting stress, overall stress, anxiety, depression, or mood disturbance. These skills and qualities, in turn, are foundational for the dynamic processes involved in developing capacities and building resilience when confronting challenges.

PARENT CAPACITIES CULTIVATED THROUGH PARTICIPATION IN CMBIS

As the three core skillsets of CMBIs, i.e., mindfulness, relational compassion, and self-compassion, are learned and practiced,

parents' adaptive responses to their child's needs may influence subtle shifts in internal experiences. These incremental changes over time can lead to better coping, accrual of inner strengths, and enduring beneficial attributes that promote resilience (Hanson, 2013). A primary question raised in the family resilience literature, however, is why some parents cope well with the challenges of caregiving for a child with a chronic condition while others struggle (Rolland and Walsh, 2006; Rosenberg et al., 2013). Even the most well-intentioned or well-resourced parents grapple with prioritizing self-care under demanding circumstances. As illustrated by our model, participation in CMBIs could support the growth of three inner capacities – stress appraisal and coping, emotion regulation, and empathy and compassion – that are essential when parenting a child with a chronic condition.

Stress Appraisal and Coping

A rich body of literature was spawned with Lazarus' and Folkman's classic transactional theory of stress and coping in the face of illness (Lazarus and Folkman, 1984). The theory describes how one responds to, or evaluates, a situation as either benign, beneficial, or stressful (primary appraisals), which is followed by cognitive and emotional processes that influence coping behaviors (secondary appraisals). How a person makes meaning of stress is imbued by one's personal belief systems, past experiences, and fundamental worldview (Park and Folkman, 1997). Guided by this approach, Thompson et al. developed a transactional model of stress in pediatric illness (Thompson et al., 1992, 1998). Because illness stressors can vary significantly across disease and conditions (e.g., child's age at symptom onset, type and severity of illness, treatment regimens and life expectancy), this pediatric care model addresses the *adjustment* to illness as a potential stressor (vs. the illness itself). This illness adjustment requires the entire family system to adapt and may involve parameters that are illness-specific or common parameters across illness (Thompson et al., 1998). These adaptations include cognitive processes of stress appraisal, health locus of control, self-efficacy, and self-esteem among others, which could be outcomes of CMBIs but to our knowledge have not yet been explored among parents and caregivers of children with chronic conditions.

The study of self-compassion and mindfulness as coping strategies is a recent line of inquiry (Allen and Leary, 2010; Tharaldsen and Bru, 2012) that aligns with coping appraisal conceptualizations. Consider that Folkman and Greer posited that meaning-making coping “helps the person relinquish untenable goals and formulate new ones, make sense of what is happening, and appraise benefit where possible. This type of coping also generates positive affect, which provides a psychological ‘time out’ from the distress and motivates further coping. An important feature of this positive affect is that it can co-occur with negative affect, perhaps not at the very same moment, but certainly close in time (Folkman and Greer, 2000).” The skill of holding both negative and positive emotions and turning toward suffering with compassion are basic elements in compassion-focused therapeutic approaches (Gilbert, 2009). There is evidence that people high in self-compassion are more likely to use positive cognitive restructuring as a coping skill compared

to people low in self-compassion (Leary et al., 2007). Self-compassionate people tend to view stressful situations in a more positive light and are less likely to judge or criticize themselves. Similarly, self-compassion in medical patients was positively associated with instrumental coping, active coping, planning, positive reframing, and acceptance, and negatively associated with denial, behavioral disengagement, and self-blame (Sirois et al., 2015). Further integration of the coping literature with self-compassion and mindfulness models is needed, along with research to explore the possible impact of CMBIs on a parent's cognitive appraisals, coping skills, and post-traumatic growth.

Emotion Regulation

In the context of the ongoing challenges faced by parents of children with chronic conditions, emotion regulation is an essential capacity. Emotion regulation is a complex process by which an individual modulates a range of human emotions, consciously and unconsciously. It refers to the processes by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions (Gross, 1998). Harnett and Dawe point out the significance of emotion regulation in their review of 24 mindfulness skills programs for children and families: "The extent to which the parent's capacity to be emotionally available and ability to consistently implement parenting practices based on fair and reasonable values and expectations is directly influenced by parent's emotion regulatory capacities" (Harnett and Dawe, 2012). Understandably, a child's illness or disability may be experienced as traumatic by parents, challenging their sense of efficacy, fairness, identity, and beliefs about the world. Parents can feel overwhelmed when faced with the daily tasks of caregiving, responding to their child's behavior and needs, and the feeling that there is no end in sight (Robinson et al., 2018). These circumstances can fatigue the family system and result in cycles of emotional distress, anxiety, and depression, leaving family members at risk for burnout (Hamlyn-Wright et al., 2007). Moreover, cultivation and regulation of positive emotions is critical for a parent population facing chronic stress. Tugade and Fredrickson proposed that activation of positive emotions while coping with challenges can foster resilience (Tugade and Fredrickson, 2007). In particular, "positive emotions can momentarily broaden people's scopes of thought and allow for flexible attention, which can in turn improve one's well-being. Over time, and with repeated experiences of positive emotions, this broadened mindset might become habitual" (Tugade and Fredrickson, 2007). For example, there is evidence that practicing loving-kindness over 7 weeks activates positive emotions and promotes a range of personal resources in working adults (e.g., increased mindfulness, purpose in life, social support, life satisfaction, and decreased illness and depressive symptoms) (Fredrickson et al., 2008).

Compassionate Attention

There is a large body of work exploring the benefits of compassion for personal and collective well-being. We draw from the emerging science on compassion in the care of self, care of

other, and ability to receive care from others (Seppala et al., 2013; Ricard, 2015). For our purposes, we refer to compassionate attention as the capacity to sustain caring attitudes and behaviors toward oneself and others in daily life, including caregiving and parenting. Compassionate attention may include being aware and accepting of one's own needs for nurturing and kindness when experiencing caregiver burnout, seeking respite or support from others, and comforting others in similar situations.

Paul Gilbert's biopsychosocial paradigm for fostering "compassionate patterns" in the brain also serves as a foundation for our conceptual model (Gilbert, 2009) and nicely integrates the capacity for emotion regulation. Gilbert describes the human responses to stress and threats from an evolutionary lens, where individual behavior and responses to the world emerge from deeply ingrained patterns in the human brain passed on from generation to generation over millennia. This has important implications in parenting psychoeducation and skill building. A person's perception of threat or safety is driven by neurophysiological mechanisms that operate largely beneath awareness; understanding these processes allows for a broader view of human nature as well as cultivating a different, less judgmental awareness of one's responses to the stressors of daily life. Gilbert purports that there are three types of emotion regulation states in the brain that are in a continual push and pull dynamic to achieve balance. These three systems include: (1) a threat and protection system that serves as a kind of background surveillance of potential threats and harms, (2) an incentive and resource-seeking system that functions to support positive feelings and motivation to seek out resources and pleasure, (3) and a soothing and contentment system, that serves to restore balance, calm, and caring connection to others, and is associated with compassion and kindness. Through skills that foster awareness of these human processes, individuals can respond to distress with greater skill, and learn to nurture themselves and others. The development of such skillful means is supported by a systematic review indicating that self-compassion is negatively associated with emotion dysregulation and positively associated with adaptive emotion regulation (Inwood and Ferrari, 2018).

Helping Parents Turn Skills to Strengths

In our model, the parents who are exposed to the core skills of CMBIs can cultivate capacities for coping and appraisal, emotion regulation, and compassionate attention, which may lead to more enduring resilience. Skills for augmenting healthy emotion regulation and soothing of self and others play an important role in the parent-child interaction (Gordon, 2009). For example, breathing skills and open awareness practices may lead to trait mindfulness, and compassion-focused meditations can more readily evoke positive feeling states, such as love, gratitude, or self-kindness. This is especially true in relation to empathy. When parenting a child with a chronic condition, there are many circumstances in daily routines and interactions with the school and healthcare systems when a parent may witness the suffering of their child. In such situations, the parent may experience empathic distress, which occurs when an unpleasant and charged reaction to suffering, distress, or pain witnessed in another causes a cascade of physiological reactions

that activate similar neural networks associated with responses to physical pain (Singer et al., 2004). When confronted with a distress trigger, one is more likely to experience negative emotional states, such as aversion, danger disgust, fear, or withdrawal. The distress can lead to empathy fatigue over time when there is little or no respite and coping may diminish. For example, parents of children with chronic pain syndrome often feel upset or helpless watching their children suffer (Palermo and Eccleston, 2009; Noel et al., 2016; Palermo et al., 2016). Parents may also inadvertently reinforce a child's "passive sick role," by giving special attention to the child, such as reduced responsibilities at home (i.e., chores) or opting out of normative social activities, which is associated with absenteeism and lower levels of school functioning (Van Slyke and Walker, 2006; Logan et al., 2012). Conversely, empathic concern is a compassionate response to suffering and is associated with positive emotions, such as warmth, caring, and connection. Evidence is emerging for the role of self-compassion in emotion regulation. For example, in a review of five studies, emotion regulation was shown to mediate the relationship between self-compassion and mental health (Inwood and Ferrari, 2018). For parents of children with chronic conditions, self-compassion has the potential to help alleviate persistent feelings of despair, helplessness, and chronic fatigue in caregiving. In daily practice, there is an art and skill to moving between moments of empathic distress to a state of compassion, whether the one suffering is another person or oneself (Singer and Klimecki, 2014).

FACTORS INFLUENCING PARENT RESILIENCE

While CMBIs provide skills that can be foundational for the development of essential capacities for caregiving and parenting, the dynamic processes of resilience are affected by the context of the family and community as well as the trajectory of the child's illness or disability. As described by Raina et al., a parent or caregiver's resilience is influenced by parent characteristics, familial function, child characteristics, social support, and social ecological factors (Raina et al., 2005). To consider the role of CMBIs in building resilience for this population, we examined key integrative family system models that include multiple facets of caregiving burden and consider the potential trajectory of illness or disability, which can vary significantly by diagnosis or condition.

Family Systems-Illness Model

Rolland and Walsh proposed "an integrative developmental system model to help children and families meet their illness-related challenges" (Rolland and Walsh, 2006). The FSI model uses a resilience framework for pediatric healthcare developed at the Center for Illness in Families at Yale University and the Center for Family Health at the University of Chicago. This model draws on the therapeutic shift in family therapy from addressing deficits to a focus on strengths. Their intention is to support the function of the family as a collaborative team, which is critical for the best psychosocial

and/or health outcomes in the context of childhood illness, disability, or loss.

Given that the trajectory of a child's illness or disability is often uncertain and prolonged, a parent naturally vacillates between present caregiving needs and future considerations. Parents also face some challenges that are constant but may evolve over time as the child ages (e.g., challenging behaviors in the context of developmental delay or the emergence of adolescence) and other challenges that are acute (e.g., a hospitalization). Importantly, the FSI model also takes into account illness-related patterns of the psychosocial demands by using a typology of chronic or life-threatening illness. Depending on the child's condition, the *onset*, *course*, and *outcome* of an illness may vary. An advantage in this approach for clinical practice and intervention is finding a "goodness of fit" between the psychosocial demands that a family can experience over the course of the child's condition and the strengths/vulnerabilities of the family. For example, a child or adolescent may have a gradual or progressive disease (childhood cancer; cystic fibrosis), a constant course condition in which an initial event is followed by a stable course (cerebral palsy; spinal injury; phenylketonuria) or one with a relapsing or episodic course (asthma; migraine; chronic pain). The *outcomes* also vary, and depending on the condition, may lead to prolonged care and disease management, death, or shortening of lifespan. Disability can involve *incapacitation*, and the degree of impairment can vary across a number of domains, including cognition, sensation, movement, stamina, and social stigma. The FSI model delineates three time phases that can help clinicians view the bigger picture: crisis (diagnosis and adjustment), chronic (the long haul), and terminal (pre-terminal, death, mourning, and resolution of loss). Naturally, each phase requires sensitivity to meet the needs of parents and family members, including siblings; support individual coping strategies; and employ age-appropriate strategies to share information with children and meeting the need for autonomy of all members. Similarly, researchers at the University of Australia proposed a model adapted from the Supportive Care Needs Framework for parenting a child with a rare disease and addressed a cohort of parents who are often overlooked (Pelentsov et al., 2015). The majority of rare diseases affect a child's life from birth. Rare diseases may also impact children and families in unique ways. For example, due to limited information and research about their child's condition, these parents may find themselves in the unexpected role of becoming an "expert" on the disease who must then inform providers about their child's needs. In some cases, parents themselves may have the rare disease and associated physical symptoms, creating the double burden of needing to receive care and serve as a caregiver.

A Multidimensional Model of Caregiving Process and Caregiver Burden

Raina et al. made an important contribution to the literature by focusing on the unique caregiver stress and burden in the pediatric population. Like the FSI model, they also consider multiple factors influencing the psychological and

physical health, but with explicit sensitivity to the parental experience of caring for children with chronic illness (Raina et al., 2004, 2005; Klassen et al., 2007). In their view, “the characteristics of the caregiver, the recipient of care, their shared history, and the social, economic and cultural context within which they find themselves combine to create an infinite variety of circumstances from which stress may both originate and be managed.” In their model, stress is conceptualized as the intersection between a caregiver’s external environment and internal states. For example, a child’s condition can greatly challenge the caregiver’s subjective response in the caring role; or alternatively, stress may ensue when the demands of caregiving interfere with a parent’s sense of identity and pursuit of other goals in adulthood. Their model suggests that social ecological context, family context, and child-related factors must be considered when developing and evaluating interventions. Family resilience models offer a lens in addressing the complexity and the contexts in which suffering of caregivers and families can arise, which CMBIs are well suited to address.

TRANSLATING THE MODEL: A CASE EXAMPLE

To highlight the breadth of parental burden and resilience, it is helpful to consider a parent’s experience relative to some of the specific conditions that have been described in the literature on chronic conditions. For example, in a child with an emotional or behavioral health problem, parents may struggle with treatment decisions due to their past experiences or beliefs. A parent may be uncertain about getting treatment due to the belief that the child will overcome the issue without treatment, may believe that a child’s mental health condition is in response to a stressful event in the family, or may harbor guilt about the impact of the parent’s own behavior on the child’s mental health (Mayberry and Heflinger, 2013). In the case of a child with a condition that can have both a physical and intellectual impact like cerebral palsy, parents may need to provide assistance with feeding, help their child with other daily tasks impacted by motor delays, and navigate comorbid behavioral health challenges (Guyard et al., 2017). How might a CMBI informed by our model promote parental resilience? We next describe a composite case based on the authors’ collective experience in facilitating and designing CMBIs (Bluth et al., 2016; Seidman et al., 2019).

Composite Case: A Mother of a Child With Rare Gastrointestinal Disease

We begin with a composite case¹ of a mother to help illustrate the model, followed by a discussion of each ring in the model, as depicted in **Figure 1**.

¹The composite case is based on the authors’ combined experiences with this population. No original data or descriptions are included in the case study.

Sofia came to a compassion and mindfulness program for parents of children with health conditions in a state of complete exhaustion. Her younger son Alex, now 5 years old, required a nasogastric feeding tube for 6 months after birth due to severe gastrointestinal problems, which meant that Sofia could not breastfeed. When he was 8 months old, she and her partner made the difficult decision to have a feeding tube surgically placed in his stomach. After 2 years of insistence from medical professionals that Alex had nothing more than gastroesophageal reflux disease, he was diagnosed with a rare gastrointestinal condition.

By now Sofia is weary of the exhaustive efforts in helping Alex learn to eat in order to wean him from the feeding tube. When sitting with Alex at mealtimes, Sofia finds herself saying to herself, often aloud, “I can’t do this, I give up.” In the hardest moments, she retreats to the bathroom so her family will not see her crying. Since starting kindergarten Alex’s diet and routine have changed. He has lost weight and Sofia feels they have lost ground. The school nurse does not have enough time to create a positive eating experience as recommended by the feeding therapists. Sofia is also worried he will be rejected by his new classmates for being different.

As Sofia engages in learning mindfulness and compassion in the parenting program, she experiences the relief of being in a room with other parents who have a variety of challenges with their children. Sofia learns that they also feel worried, frustrated, guilty, sad, and angry. The group facilitator demonstrates a quality of warmth, calm, and containment. For the first time Sofia does not feel judged, but begins to understand the meaning of common humanity, *we are all in this together*. Building new skills, however, is not easy. During meditation, Sofia finds herself distracted due to feelings of guilt about being away from home at Alex’s mealtime. No matter how hard she tries to believe the kind and supportive words from friends and medical professionals, she cannot help but think that she must be doing something wrong when she tries to feed him.

After starting the program, she is increasingly aware of her inner dialogue at home. She notices that her thought patterns are full of judgment and self-criticism. *This is my fault. I’m a terrible mom. What am I doing wrong? The therapists say I should make meals fun, but I always get so frustrated. If I took better care of myself, I would be more patient. But how am I supposed to find the time?*

Sofia begins to experience a shift as she practices the self-soothing strategy of putting her hand on her stomach whenever she feels tense. She learns that this soothing gesture along with a kind intention toward herself releases important hormones that have a calming

effect. A kinder voice arises within her. She acknowledges that while life with Alex is hard, her feelings of fear, anxiety, and overwhelm are natural under the circumstances. Her perspective shifts when in one session, another mother points out that the feeding tube is not so terrible because the tube ensured that her child could obtain the needed calories to grow while experiencing and learning to enjoy new foods. This new perspective eases Sofia's resentment about the feeding tube and she becomes more hopeful about the future. Her anxiety lessens and she sleeps better. Sofia finds herself able to think more clearly about the best path forward. She advocates for a special aide at school to manage the feeding protocol and requests that Alex receive tube feeds in privacy so other children will not stare. Sofia feels renewed in her commitment to advocate for her son.

Things change at home, too. Sofia becomes more sensitive to Alex's reactions to food, noticing when he seems to be struggling with food textures. Her new awareness and ability to calm her own fears help her when struggling with Alex. When she notices a negative inner voice, she often remembers self-compassion statements she created in the program, such as, "I'm doing the best that I can." The family also starts to have meals together instead of feeding Alex separately. Sofia now spends more quality time with her older daughter and even teaches her to how cultivate a "compassionate friend" as a bedtime meditation. After the program ends, Sofia continues to take compassion breaks during the day. In difficult moments, she recalls the faces of the parents and asks herself, "What would they say to me right now?" Sofia's inner voice of compassion answers with a deep knowing and sense of warmth and caring, "This is so hard right now, but it is going to be OK. I am not alone."

We now apply the model (**Figure 1**) to understand this parent case, starting from the center and moving out.

The Parent/Caregiver (Center)

In our model, Sofia, the parent, is at the center. As the expert on her own experience in caring for her child, the assumption is that she is seeking reinforcement of her own inner wisdom and motivation for self-care. Resilience is not simply returning to a preexisting level of well-being but rather bouncing forward to greater capacity, strength, and personal growth as parents face the shifting challenges over the course of a child's condition and childhood. As Sofia builds her skills, she implements new strategies for healing and well-being. Parents of children with chronic conditions are in continual state of worry and vigilance as they "face the formidable challenge of focusing on both the present and the future" of their child (Rolland and Walsh, 2006). Caught on a tightrope of the daily tasks of caregiving and future planning, parents like Sofia are in an ongoing balancing act. These situations are fertile ground for rumination,

hopelessness, and social isolation, which could be reduced by exposure to CMBIs (Hilt and Pollak, 2012).

Introduction of CMBI Skills (Inner Blue Ring)

Sofia joins a program designed for parents that includes content and practices related to developing skills related to three core areas: mindfulness, relational compassion, and self-compassion. CMBI therapies (e.g., ACT, MBCT, Compassion-Focused Therapy) and group interventions (e.g., mindful parenting, MSC, MBSR, CCT, MBCL), or hybrid parenting interventions serve to help individuals cultivate inner resources and emotionally nourishing states of wellbeing as essential to self-care. As a felt experience or quality of being, mindfulness and compassion are inseparable. We recognize it is largely a matter of emphasis among the CMBI repertoire. The psychologist and meditation teacher Tara Brach describes mindfulness and compassion as two wings of a great bird that enable "coming home to loving presence" (Brach, 2016). Moreover, how a therapist or group facilitator embodies these qualities of awareness – seeing clearly and holding one's experience with compassion – may be a potent source for parents in acquiring skills (Pollak et al., 2014). Sofia learns not only from the other parents, but from the gentle guidance of the teacher. With practice of CMBI skills over time, "states" can be turned into enduring "traits" fostering post-traumatic growth (Hefferon et al., 2009; Garland et al., 2010; Hanson, 2013).

Coping, Emotion Regulation, and Compassionate Attention (Green Ring)

Participation in CMBIs supports the development of essential capacities: adaptive stress appraisal and coping, emotion regulation, and compassionate attention. For example, Sofia learns *emotion regulation skills* related to her breathing and resting her hand on her belly. Mindful awareness skills taught in CMBIs are intended to engage parasympathetic responses, and offer new ways to relate to experiences that are present moment-focused rather than avoidant. In the context of daily or episodic challenges related to a child's health and caregiving, emotion regulation may be supported by mindfulness skills, such as noticing and accepting difficult thoughts or emotions and practicing self-soothing activities, e.g., getting rest, listening to music, paying attention to the breath, or practicing a brief body scan meditation (Shapiro and White, 2014). Sofia begins to identify her emotions and to take a step back from the intensity of a stressful parenting or caregiving situation, take short breaks (i.e., parent "time-outs") to relieve stress, and practice present moment awareness during mealtimes with Alex. In time, these practices may also foster dispositional mindfulness in Sofia, and in turn, promote greater clarity, calm, and coping in day-to-day caregiving, enabling her to assess and reassess goals as Alex grows up or the condition changes, and planning for future challenges (e.g., entering the school system and planning for independent living as a young adult).

One of Sofia's greatest challenges is weaning Alex from his feeding tube. When it comes to a child's needs, compassion skills may foster warmth and caring in challenging situations (Gilbert, 2009), an openness to understanding the child's

perspective and need for autonomy, greater tolerance for empathic distress, and less parental solicitousness. Parents of children with chronic conditions may benefit from such strategies when facing acute issues, such as challenging behaviors, medical crises or a child's pain, as well as persistent long-term worries, such as concerns about who would take care of the child if the parent becomes ill, incapacitated, or dies. For parents like Sofia, who struggle with promoting child autonomy and boundary-setting due to disabilities or treatment regimens, greater emotion regulation and psychological flexibility enable them to better respond to conflicts that arise over roles or responsibilities or stay in the present moment without being overcome by a child's pain or difficulties (McCracken and Gauntlett-Gilbert, 2011).

As Sofia engaged with other parents in an environment of safety, she listened to their stories and learned from them. She began to cultivate adaptive *illness-related appraisals* and cope better. She experienced a shift in mindset when hearing another mother's perspective about weaning her child off of a feeding tube. This positive appraisal helped Sofia reassess her own beliefs in how she related to the feeding situation. It also shifted her behaviors and attitudes about managing mealtimes, resulting in more pleasant experiences for the entire family. As was suggested by Duncan et al. in their mindful parenting model (which includes the components of *listening with full attention* and *compassion for self and child*) (Duncan et al., 2009), mindfulness may enable parents to use more adaptive appraisal and coping skills in relation to the child, the situation, or themselves. In addition to responding to the immediate caretaking needs of their children, parents may engage in action-oriented coping, such as addressing situations that arise in caregiving or with schools, engaging in advocacy and building community.

As Sofia begins to notice a critical inner voice about her mothering, she is cultivating *compassionate attention*. Parents can apply self-compassion practices in specific situations that may evoke shame or guilt, such as feeling judged by others about their parenting, receiving unsolicited advice, self-blame about not doing enough for their child, or fear of making the wrong treatment decisions. Informal self-compassion practices can include a moment of breathing with the hand over the heart, use of personalized compassion phrases, soothing touch, or compassion breaks (Neff and Germer, 2018). Considering the challenging life circumstances of parents of children with chronic conditions, formal compassion practices, e.g., loving-kindness meditations or compassionate body scan, may be more difficult to apply with time constraints, but experiences with these meditations in a class could provide a learning opportunity that allows for informal use of these practices in difficult moments. Other compassion meditations call on use of imagination. Caring imagery is intended to evoke positive feelings. These visualizations can induce a kinder inner voice and compassionate attributes, such as tenderness and warmth, non-judgment, safety, strength, inner courage and wisdom (Gilbert, 2009, 2010; Neff and Germer, 2018).

Illness and Disability Trajectories (Orange Ring)

Wrapped around these capacities is the parent's journey along the illness trajectory, depicted by the outer orange ring. Sofia

is facing the challenge of Alex starting school, which requires him to be more self-sufficient as he grows up and also involves relying on school personnel to be both sensitive and skillful regarding his basic needs. The application of the core skills and cultivation of enduring capacities can benefit parents along the unpredictable journey of the child's illness or disability as described by the Family Systems-Illness model, e.g., symptom onset, diagnosis, course of illness, and outcome, including incapacitation or loss (Rolland and Walsh, 2006). Strengthening adaptive appraisal and coping, emotion regulation, and compassionate attention may buffer the stress of uncertainty. There may be a virtuous cycle of well-being as a parent becomes more fluent in a mindfulness or compassion skill. The practice of CMBI skills may enhance these three capacities and *vice versa*, in a bidirectional and dynamic manner.

Factors Influencing and Influenced by Parent Resilience (White Area)

Sofia feels safe and understood in the parenting group as she learns about other parents' unique situations and shares in their struggles. The factors listed outside the circle in which a parent is contextually situated with arrows suggest that they impact the parent's resilience along the journey. As parents practice informal or formal skills offered by CBMIs, they may experience stress reduction and improvements in well-being. They may also experience beneficial changes in intrapersonal and interpersonal dimensions of caring for a child with a chronic condition and interacting with family members and others involved in the child's care. The application of these skills supports the key adaptive processes in family resilience, including belief systems (making meaning of adversity, positive outlook, transcendence, and spirituality), organizational patterns (flexibility, connectedness, and social and economic resources), and communication/problem-solving (clarity, open emotional expression, and collaborative problem-solving) (Rolland and Walsh, 2006). Notably, social isolation and stigma are frequently experienced by this population of parents, and fear of compassion may also arise (i.e., parents may find practicing self-compassion and receiving compassion difficult). As such, the recognition of common humanity that emerges from engaging with other parents offers an opportunity to both offer and receive compassion and may be a key mechanism supporting resilience by normalizing difficult emotions and recognizing that one is not alone (Neff and Germer, 2013). The importance of fostering beneficial experiences and positive emotions in the experience of caregiving cannot be overstated, and this may be best served in caring communities.

FUTURE DIRECTIONS

We have suggested that CBMIs could support the development of foundational skills that enable greater resilience in caregiving and parenting a child with a chronic condition. There is an opportunity to build on the existing interventions for this population and learn from interventions in other populations – particularly compassion-focused interventions – to reach more

families in need and improve additional outcomes related to parenting and caregiving in the context of chronic illness or disability. We therefore advocate for (1) development or adaptation of compassion-focused interventions for this population; (2) continued development of tailored interventions in partnership with parents and other caregivers; and (3) research to examine the impact of these interventions on parent and child resilience.

Development or Adaptation of Compassion-Focused Interventions

Mindful parenting interventions have laid the foundation for further development of interventions to include a stronger focus on self-compassion and relational compassion to foster parent resilience, self-care, and coping skills. Self-compassion practices hold the potential to ease feelings of guilt, shame, or disappointment that may plague parents who are struggling to make meaning of the life-long challenges that are unlike those of other families around them. Relational compassion, through connection with other parents, may help with some of the unique challenges of parenting a child facing medical issues (e.g., pain episodes, medication, or therapy adherence) or developmental or behavioral challenges (e.g., internalizing or externalizing behaviors). Group interventions that include activities promoting a sense of common humanity may be particularly healing, with the shared recognition that other parents facing child health challenges are also struggling to reduce feelings of isolation. In addition, the cultivation of relational compassion could lead to greater understanding of others involved in the child's life, medical care, or school. This, in turn, may help parents navigate complex relationships within the wider community.

Development of Tailored Interventions

Considering the social isolation, stigma, and unique medical, developmental, or behavioral challenges faced by parents of children with chronic conditions, they are likely to feel most comfortable in settings with peer parents. In fact, support groups for parents of typically developing children (e.g., for new parents or parents of toddlers) could have the unintended consequence of causing additional feelings of grief and loss if parents facing these unique challenges are exposed to conversations about the typical challenges of childhood. In light of the difficult emotions that come with raising a child whose daily life and activities are impacted by his/her health condition or disability, parents may find great benefit from tailored interventions that address feelings such as grief or loss, resentment, frustration with child behaviors, or anxiety about the future and provide an opportunity for parents to see that other parents are experiencing similar feelings. Much can be learned from tailored interventions that have been tested. Benn et al. and Bazzano et al. described adaptations to Kabat-Zinn's Mindfulness-Based Stress Reduction (MBSR) curriculum that were specific to this population, integrating concepts such as emotion regulation, forgiveness, kindness, and compassion and incorporating group discussions about stress or concerns related to the child and their future (Benn et al., 2012; Bazzano et al., 2013). These researchers found improvements

in self-compassion following the intervention. Of note, Benn et al. included mindfulness training for teachers, recognizing the importance of coordinating parent and teacher interventions to optimize child outcomes (Benn et al., 2012). Considering that many families of children with chronic conditions have frequent interactions with therapists (e.g., occupational or speech therapy), medical providers, and school professionals, interventions that support the mindfulness and compassion of these professionals could prove beneficial personally and professionally, alleviating caregiver burnout and developing their capacity to provide a mindful and compassionate presence to families.

Collaborating with parents and other caregivers in the design of these interventions is essential because their experiences and challenges are very different from parents of children without chronic conditions. For example, Bazzano et al. developed their curriculum using a community-based participatory approach that involved collaborating with parents of individuals with developmental disabilities who participated as equal partners on the project planning committee, guiding the program and research design and implementation (Bazzano et al., 2013). The intervention resulted in a significant reduction in perceived stress and in parental stress and increased mindfulness, self-compassion, and well-being. Dykens et al. trained parents of children with disabilities to deliver MBSR or Positive Adult Development (based on positive psychology) in a randomized controlled trial comparing the efficacy of the two interventions (Dykens et al., 2014). Collaboration with parents and caregivers is also important to ensure the design and evaluation of CMBIs that are culturally relevant for communities of color. To our knowledge, most interventions have been conducted with predominantly Caucasian participants. Most studies with culturally diverse populations did not examine differences in outcomes based on race, ethnicity, culture, or religions, with the exception of a study by Neece et al. (2019) that found that participation in MBSR with simultaneous English-Spanish interpretation resulted in improved mental health for Latino parents of children with developmental delay. Formative research is needed to explore the extent to which mindfulness and compassion practices align with the cultural or spiritual values of communities of color and inform the design of culturally relevant interventions.

Participation of parents and caregivers in the design process could also help address barriers to participation to ensure that CMBIs are both accessible and impactful. If these barriers are not addressed, these interventions could have the unintended consequence of increasing health disparities, with the most privileged families having improved outcomes as a result of participation in CMBIs while the most disadvantaged families continue to experience high levels of stress and poor mental health. First, there are issues associated with poverty and geography. Chronic conditions are more prevalent among children facing poverty and trauma (Bethell et al., 2014), and their families are less likely to have the time and resources needed to participate. In addition, these programs are primarily offered in urban areas and in major medical academic centers, making access difficult for families in rural areas, who may face the greatest isolation and may have more challenges in

accessing services. Second, parents of children with chronic conditions face significant challenges in caring for their child and obtaining child care. It may not be possible to attend weekly sessions, participate in a standard 8-week CMBI program, or engage in daily formal meditation practice. Other formats should be explored for feasibility and impact. For example, a feasibility study examining a one-time, 2-hour mindful parenting workshop for parents of an adolescent suffering from chronic pain and inflammatory bowel disease paired with a concurrent mindfulness workshop for adolescents found satisfaction with the program and immediate benefits for aspects of psychological flexibility although no change in mindful awareness (Coakley and Wihak, 2017). Other CMBI innovations include technology-based tools and resources that may offer overburdened or under-resourced parents with compassion and mindfulness skills training, psychoeducation, and a sense of community. For example, a single-arm feasibility pilot of a mobile intervention for parents of children with chronic pain revealed significant decreases in parental solicitous behavior and perceived stress, and a significant increase in mindful parenting (Seidman et al., 2019).

Research Examining the Impact of CMBIs on Parent and Child Resilience

Research is needed to explore the hypothesized relationships underlying our model and to determine whether participation in CMBIs results in greater resilience for this population. Cross-sectional studies such as path analysis offer one way to examine direct and indirect associations between the constructs in the model. This can be challenging given that interventions include a variety of skills and techniques, and measurement tools have overlapping constructs. However, research could explore questions such as whether parents with high dispositional mindfulness show more adaptive coping and greater emotion regulation in challenging situations or when facing long-term

worries about their child, or whether parents with high self-compassion show greater emotion regulation, more adaptive coping, and greater relational compassion in parenting. Research could also examine the relationship with resilience and post-traumatic growth by exploring whether parents with more skills related to emotion regulation, appraisal, and coping, or compassionate attention show greater resilience. In addition to measuring the impact of CMBI participation on parents, research is needed to measure the impact on the child or the siblings.

In summary, this article describes efforts to extend and integrate previous conceptualizations of parent resilience in caregiving through the lens of compassion and mindfulness-based frameworks. Our model for parental resilience suggests that the outcomes for parents, children, and the family system as a whole may be improved by helping parents cultivate compassion and mindful awareness in the context of caregiving. As one mother said after a long hospitalization for her child with a rare heart condition, “We can live our lives in a constant state of worry and fear for an outcome that is beyond our control, or we can choose to live in the present moment so we can take in all that is beautiful in our lives.”

AUTHOR CONTRIBUTIONS

TC takes responsibility for the writing and submission, contributing a significant portion of the work. KA is the principal scientist, contributing a significant portion of the review of the burden of pediatric chronic conditions and the future directions. LH is an expert in mindfulness and self-compassion and family systems, and served as advisor and contributed to portions of the writing and review of drafts. All three contributed to the creation of the conceptual model and image.

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A Brief Mindfulness-Based Family Psychoeducation Intervention for Chinese Young Adults With First Episode Psychosis: A Study Protocol

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Family psychoeducation (FPE) has been recommended as a major component in the treatment of psychosis. Many previous studies have implemented an intensive program design that often only emphasized improvements in patients' illness outcomes but the benefits for caregivers were limited. There have been calls for a time-limited but cost-effective FPE program to mitigate the looming reality of the suffering of people with psychosis and their families. A Brief Mindfulness-Based Family Psychoeducation for psychosis program is developed to reduce caregivers' burden and promote young adult's recovery. A randomized controlled trial will be conducted to compare this intervention with an ordinary FPE intervention. Both arms will involve six sessions, with a total contact time of 12 h. 300 caregivers of young adults who have experienced first episode psychosis within last 3 years will be recruited. Program effectiveness will be assessed by comparing outcomes measuring the caregivers' burden, mental health symptoms, positive well-being, and the young adult's mental health symptoms during the study and at 9-month post-randomization. The role of expressed emotions, interpersonal mindfulness, and non-attachment in mediating these outcomes will be explored. An additional qualitative approach Photovoice is selected to explore the complex family experiences and the benefits of mindfulness from the caregivers' personal perspectives.

Trial Registration: The trial is registered with the United States Clinical Trials Registry (ClinicalTrials.gov): NCT03688009.

Keywords: mindfulness-based intervention, family psychoeducation, psychosis, mixed methods, randomized controlled clinical study

INTRODUCTION

Psychosis and Its Impact on Young Adults and Families

Psychosis is defined as a mental, behavioral, or emotional disorder that has been medically diagnosed for at least 1 year. Psychosis usually results in serious functional impairment, which substantially interferes with or limits one or more major life activities and functions in social, family, and vocational/educational contexts (Lefley, 2009). The lifetime prevalence of psychosis is around 0.7 to 2.5% of the general population (Kessler et al., 1994; Chang et al., 2017).

Psychosis has a marked increase in prevalence between the ages of 15 and 17. The majority of psychosis manifests between ages 20 and 30, with a median age for first psychotic episode of 22 (Kessler et al., 2007). Young adults with psychosis often have restricted social networks and experience great social isolation (Bebbington and Kuipers, 2008). One study reported that at their first contact with psychiatric service, over 40% of young adults were not in school or employment (Marwaha et al., 2007). A meta-analysis reported that 34.5% of individuals with psychosis perpetrated violent behaviors before their admission to psychiatric services (Large and Nielssen, 2011). Recent studies have found that 42% of patients with first-episode psychosis reported suicidal ideation, and 9.4% committed violent behaviors (Chang et al., 2014, 2015). Young adults with psychosis experience a high-risk period that places immense strain and anxiety on family caregivers.

Family Caregivers of Young Adults With Psychosis

Family caregiving is defined as one's commitment to the welfare of another family member, and the provision of voluntary care to meet their physical, psychological, and developmental needs (Revenson et al., 2016). Family caregivers often take up their role without any formal preparation, knowledge, resources, or skills, and frequently experience great psychological burden. Such burden can be assessed in empirical terms as the consequences for the family's physical and psychological well-being. Managing family members' bizarre behaviors, fluctuating emotions, suicidal ideation, and unemployment after the onset of psychosis are the major sources of caregiving burden (Wong et al., 2012). Burden can also be perceived in subjective terms by individual caregivers, relating to their negative emotions arising from the suffering of the family member, such as loss and grief, and the negative perceptions of relatives and community members (Lefley, 2009).

Some studies of caregiving have focused on family expressed emotions (EEs), a robust predictor of relapses and overall outcome of psychosis, including number of relapses, hospitalization, and symptom severity (Hooley, 2007; Weintraub et al., 2017). High EEs are defined as criticism, hostility, and over-involvement (Brown et al., 1972), and are considered a reciprocal process in family interactions that are developed and increased after the onset of illness, particularly in the first 5 years (Hooley, 2007).

However, other studies of EEs targeting psychosis have suggested a more complicated picture. A recent review of higher EEs concluded that higher levels of criticism predicted positive symptoms of psychosis, but the association between negative symptoms of psychosis and high EEs was weak (Cechnicki et al., 2013). Further, avoidant coping, negative appraisals of the illness's impact, and perceived losses were associated more frequently with family EEs. Among families facing psychosis, over-involvement is often normal, as young adults have not fully developed their own self-care abilities, and the boundaries between positive concern and family over-involvement are blurred (McNab and Linszen, 2009). Higher levels of EEs are more likely to be found in families from non-Western cultures, such as Indian, Japanese, and Chinese families (Bhugra and McKenzie, 2010). Higher EEs may be the cultural norm in these countries, as they coexist with positive factors such as family connectedness and strong family ties.

Family Psychoeducation for Caregivers

Family psychoeducation (FPE) is a core component of treatment for psychosis, as recommended by the Schizophrenia Patient Outcomes Research Team and the National Institute for Health and Care Excellence (Dixon et al., 2009; National Institute for Health and Clinical Excellence, 2015). Many FPE programs apply cognitive behavioral models with an emphasis on modifying family dysfunction, characterized by high EEs, and usually involve the teaching of practical knowledge and skills required to manage psychosis (Sellwood et al., 2007; McFarlane, 2016). Other program components include empathic understanding, social support, normalization of reactions, resource information, exchange of coping strategies, and installation of hope (Lefley, 2009).

The efficacy of FPE varies across studies and there is room for improvement. An earlier meta-analysis reported that FPE largely benefited people with psychosis. The 1-year relapse rate for the treatment group was 6 to 12% while those for the control group was 41 to 53% (Falloon, 2004). A recent systematic review reported variations in benefits of FPE in psychological distress of caregivers. The overall quality of study was low, and limitations including high heterogeneity and small sample sizes were identified (Yesufu-Udechuku et al., 2015).

To improve the efficacy of FPE, first, its design should be more theory-driven. A recent review study concluded that it remains unclear how and why FPE works (Gracio et al., 2016). The assumptions about higher EEs and their role in preventing relapses have not been investigated in studies of FPE, and many highly burdened families have not shown higher EEs (Lefley, 2009). EE and more family related variables as potential mediating variables should be included in studies of FPE.

Second, FPE interventions should be simple, practical, effective and sustainable. Previous program designs have been relatively long and unstructured. For example, a study of an 18 session FPE program reported selected improvements in the functioning of patients and families and caregiving burden, and fewer relapses (Chien and Wong, 2007). However, such an intensive program will create difficulties in implementation, and

families were burdened by participating in such an intensive program (Glynn, 2012).

Third, developmental needs and cultural issues for psychosis should be included as a guiding theoretical model (McNab and Linszen, 2009). The management of young adults with psychosis is beyond the comprehension of most parents, particularly from Chinese or East Asian societies, who often pre-occupied about their obligation to raise, or support a healthy and successful child, and experience strong sense of loss, guilt, and frustration for not being able to help the young people to fully resume their premorbid functioning (Wong, 2000). Reduced caregiving burden has been associated with the acceptance of the patient's behaviors, illness course and caregiver's own social functioning (Magliano et al., 2005). Therefore in a FPE, it might be beneficial to promote the quality of non-attachment in caregiving, which is defined by an absence of holding, or a fixation on desirable values or behaviors as determined (Sahdra and Shaver, 2013). Besides, based on a new conception of recovery for psychosis, families can be strengthened in finding hope and commitment through building new self-identities for young adults, and being involved in developing meaningful goals and strengths, beyond the label of mental patients and achieving symptom control and medication compliance (Davidson et al., 2005).

Mindfulness-Based Intervention and Its Application in Families

Mindfulness-based interventions (MBIs) have been widely adopted as an evidence-based approach in supporting people with chronic medical conditions (Bohlmeijer et al., 2010). Mindfulness is defined as paying attention, non-judgmentally, to the present moment (Kabat-Zinn, 2013). In MBI, instructors provide guided training on mindfulness exercises, including body scan, stretching, and mindful sitting. An inquiry into participant needs is followed by an exploration of their personal experiences. New insights and understandings about participants' reactions to stress are addressed.

Mindfulness-based intervention originates from a stress and coping model for individuals with chronic conditions (Kabat-Zinn, 2013; Segal et al., 2013). It can improve their attention, promote tolerance of unpleasant sensations and feelings, and facilitate cognitive changes and effective coping, and all these benefits may be helpful in supporting the caregivers in managing the caregiving burden and EE. A recent review suggests the mindfulness role of adaptive emotion regulation that MBI can reduce intensity of emotional distress, enhance emotional recovery, reduced negative self-referential processing, and promote the engagement in goal-directed behaviors (Roemer et al., 2015). In dynamic bi-directional relationships in caregiving, family caregivers experience stress arising from monitoring psychotic symptoms and alerting the young people with psychosis who has impaired insights about their own care needs (McNab and Linszen, 2009). Moreover, the entire family often experiences the spill-over effect of the psychosis, as the original functioning of all other members are frequently disrupted, and caregivers may feel overwhelmed in their anxieties and diminished abilities to cope (Quah, 2015).

Some studies have applied MBI to parents or caregivers and suggested it can benefit participant's family systems. 86 parents of children with mixed psychiatric diagnoses were recruited in a non-randomized clinical trial of a MBI. Improvements were found not only in the mental health symptoms of both the children and their parents, but also in parenting behaviors, and parental stress (Bögels et al., 2014). This study included outcomes of caregivers, care recipients, and quality in caregiving but two major limitations were lacking randomization and the heterogeneity of the sample. A study of 40 wives of people with schizophrenia reported that compared with those in control group receiving no intervention MBP participants had a higher level of resilience, but other clinical outcomes of the caregivers and people with psychosis were not included (Solati, 2017). More studies were based on parents or caregivers mixed medical conditions using MBI. For example, 141 caregivers of persons with chronic conditions were randomized into mindfulness-based stress reduction program or self-help control group. Participants reported reduction in depressive and anxiety symptoms, self-efficacy and mindfulness (Hou et al., 2014). Although such rigorous study give support to the effectiveness of MBI, outcomes of the care recipients are not included in the study design and we cannot be certain whether MBI can benefit the family members who did not participate in the intervention directly.

A brief mindfulness-based family psychoeducation (MBFPE) for first episode psychosis is developed and a randomized controlled trial of the MBFPE with an active control group will be conducted. The MBFPE will be offered to caregivers only but outcomes of young people with psychosis will also be investigated. Mindfulness is consistent with a holistic view of recovery. Caregivers may learn to appreciate and incorporate the key recovery principles of recovery such as self-determination, resilience, respect, and hope (Davis and Kurzban, 2012; Murray et al., 2017) and positive indicators of recovery will be included as one of the outcome measures in this study.

As the theoretical underpinning for applying mindfulness in family caregiving is emerging, there is a call for studies of MBI that specified clear targets of intervention that can investigate and generate knowledge about mechanisms of change (Dimidjian and Segal, 2015). This study may contribute additional evidences of applying MBI in families as well as the change mechanism of caregiving process. The mediating effects of interpersonal mindfulness, EE, and non-attachment will be explored: first, inspired by on the positive outcome on interpersonal mindfulness in some recent studies (Lo et al., in press), we shall test whether caregivers' mindfulness can be improved after MBI and whether it will mediate the changes of other outcomes. Second, as studies have selected emotion regulation as a change mechanism of mindfulness (Gratz and Tull, 2010; Roemer et al., 2015), we explore if MBI can reduce EEs that can lead to reduction of caregiver burden, other positive and negative mental health indicators and improvements in overall family functioning. Finally, caregivers may have potential benefits in cognitive flexibility in MBI. In view of the mediating effect of over-attachment in the change of anxiety and depression in MBI (Lo et al., 2013), we investigate the role of non-attachment

in the outcomes of MBFPE in this study (Sahdra et al., 2010; Jansen et al., 2015, 2017).

Objectives

The current study will test the following three hypotheses based on the literature:

- (i) Caregivers who participate in a MBFPE program will experience less caregiving burden, less anxiety and depressive symptoms, less physical distress, more positive caregiving experiences, higher levels of interpersonal mindfulness, higher levels of well-being, higher levels of perceived family functioning, higher levels of non-attachment, and less unplanned medical consultations than FPE participants.
- (ii) Young adults will report reduced psychiatric symptoms, higher levels of recovery, lower EEs, and less days in hospitalization after their caregivers' participation in MBFPE than FPE.
- (iii) Improvements in interpersonal mindfulness, EE, and non-attachment will mediate improvements in caregiving burden and other outcomes in caregivers and adults with psychosis.

The embedded use of Photovoice in the intervention will add knowledge about experience of caregivers for further improvements in FPE and MBI.

MATERIALS AND EQUIPMENT

Study Design

This study will be a multi-site randomized controlled trial, with a mixed-methods design. The effects of the intervention will be tested using a two-arm randomized controlled trial, comparing the MBFPE (arm 1) to an ordinary FPE (arm 2). Assessments will be made before the intervention (T1), after the intervention (T2), and at 9-month follow-up (T3). The program effects will be tested using both between-subject differences (comparison of the two arms) and within-subject differences (comparison of measures at T1, T2, and T3).

Both MBFPE and FPE include 1 h psychoeducation video that has been standardized for implementation. Another 1 h is used for mindfulness training in arm 1 and for sharing and discussion in arm 2. The strengths of this study is the use of an active control group in arm 2. If hypotheses 1 and 2 are supported, it will offer a strong evidence that a brief 6-h mindfulness training can produce additional effects to ordinary psychoeducation programs.

Participants

Sample Size Estimation

As no similar study has been conducted, the sample size calculation is based on a study of a MBI for parents of children with developmental disabilities, in which an effect size of 0.65 in stress (Lo et al., 2017), with an estimation of an effect size of 0.15 for arm 2. For a two-tailed α error of 5%, an 80% power, and a test of two independent groups, the required

sample size will be 128 participants for two arms (Cohen, 1988). We further adjust the sample size based on an estimation of drop-out rate and intra-class correlation. The estimated drop-out rate of 15% is based on two local studies of MBIs (Hou et al., 2014; Lo et al., 2017). The estimated intra-class correlation of 0.07 is based on the first author's two recent mindfulness multi-site studies, in which the intra-class correlation ranged from 0 to 0.07, and related studies in Western contexts (Adams et al., 2004; Lo et al., 2017). 300 caregivers will be recruited for this study. A flowchart of the study's planned recruitment and implementation is illustrated in **Figure 1**.

Recruitment Process

The study will be based on convenience sampling, as it is not possible to collect a full list of young adults with psychosis and caregivers due to confidentiality of medical records and personal data. The study inclusion criteria are as follows: (1) caregivers of a young adult under the age of 35 who has experienced first episode psychosis in the last 3 years. Psychosis include Schizophrenia Spectrum and other psychotic disorders and bipolar and related disorders in Diagnostic and Statistical Manual of Mental Disorders, 5th Edn (DSM-5; American Psychiatric Association, 2013); (2) caregivers who have offered care to the young adult for at least 1 year; (3) young people with the capacity to provide informed consent and to respond the questions in assessment interviews. The exclusion criteria are as follows: (1) caregivers who have been diagnosed with psychosis or developmental disabilities, such as intellectual disabilities, which may cause difficulties in comprehending the content of the program; (2) caregivers or young adults who refuse to participate in regular psychiatric consultations.

The research project "Family Psychoeducation for Psychosis" will be announced and promoted in all psychiatric units of the Hospital Authority, by psychiatrists in private practice, local school social work and youth mental health services, and student counseling services in all tertiary education institutions via emails and mailed project leaflets. Three integrated mental health service NGOs and one mental health hospital will participate in the study by assisting with its promotion, recruitment, program implementation, and data collection. The service centers and the University of the Principal Investigator are located at the north-western, middle, and eastern districts with convenient public transportation and all caregivers living in the city can reach one of these sites within 1 h.

All interested caregivers will be invited to participate in a briefing session, in which the rationale of the study and components of FPE will be explained. Both arms will be referred to as a "Family Psychoeducation Program," and the term "mindfulness" will not be used for arm 1, to minimize the potential placebo effect. After they indicate their intentions to participate in the study, written consent forms will be distributed and collected from the caregiver. During the briefing session, the research team will explain the invitation of young adults with psychosis in the study so that they may choose to prepare their family members about the arrangement. A research team member will initiate follow-up contacts with the young adults

with psychosis and invite them to participate in this study. It will be emphasized that the participation of study is independent from the mental health care he received from collaborators, if suitable, and they have the rights to withdraw from the study at any time without negative consequences. Priority will be given to caregivers if their young adults with psychosis agree to participate in the assessment. Social workers from the NGO collaborators will provide standard care to the selected young adults, and encourage them to participate in the study. Research assistants will administer the random assignment using computer generated programming, and treatment allocation will be blinded to the participants. The participants will be randomly assigned to the MBFPE (arm 1), or ordinary FPE (arm 2) conditions. However, to ensure the use of blinding in the project, all collaborators who are involved in promotion and recruitment and the assessors of young people outcomes will not be involved in the randomization and program implementation.

In order to improve the attrition rate and the intention to participate the study at all three time points, cash remuneration coupons of HKD100 (about USD12) will be provided to caregivers at T2 and T3. HKD200 (about USD25) coupon will be provided to young adults who complete the study at T1, T2, and T3. Offering cash remuneration coupon is an incentive to research participants and is commonly adopted as a strategy to enhance recruitment and enable them to participate in the study without financial sacrifice (Grady, 2005). The underlying ethical concerns are researchers and collaborators should not influence the participants or force people to participate in the studies with coercion through the use of excessive incentive (Largent and Lynch, 2017). All researcher team members including collaborators should be clear about the research ethics that participants are free to participate and to withdraw from the study at any time without any negative consequences. In reality, a significant proportion of the caregivers and young

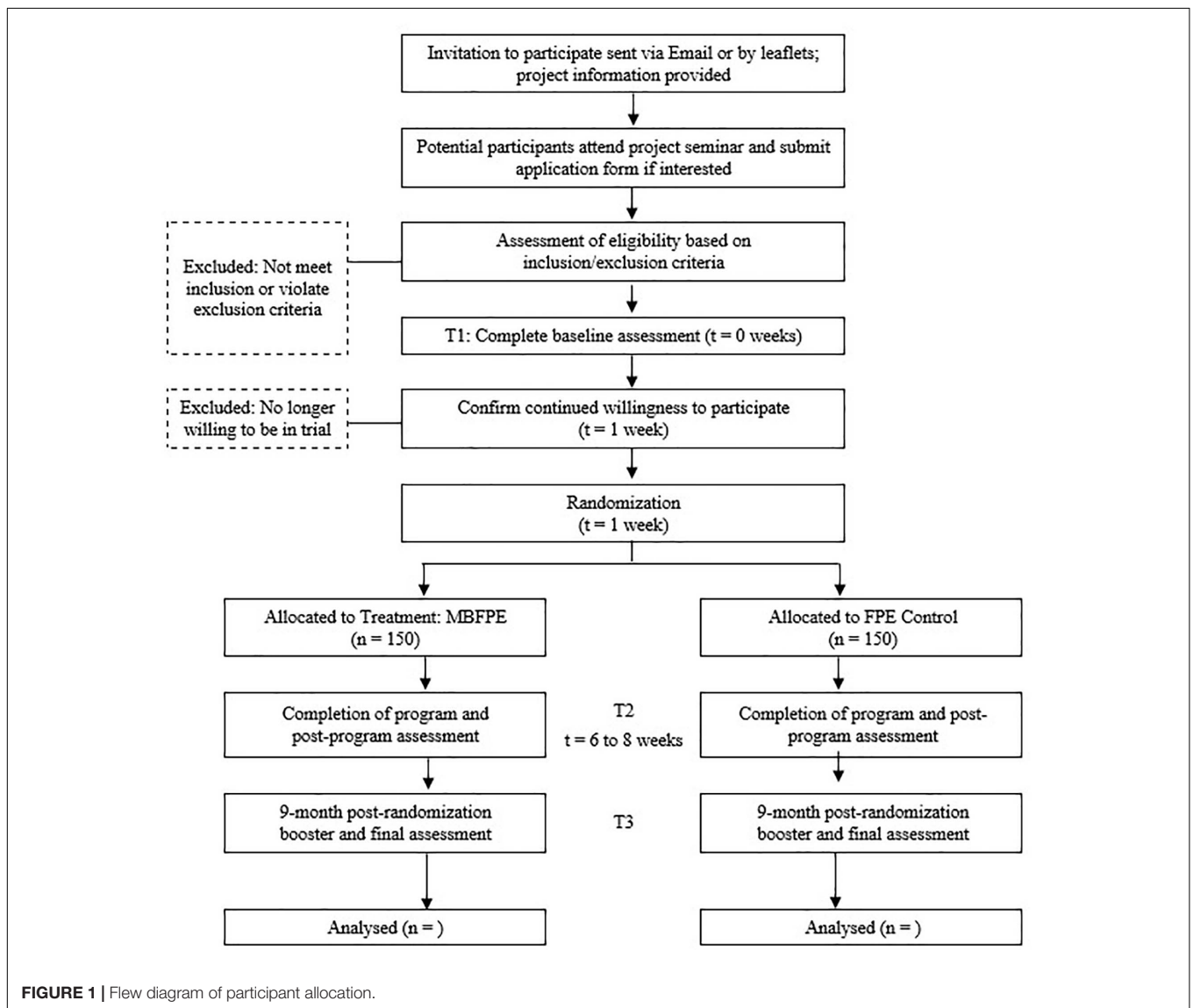


FIGURE 1 | Flow diagram of participant allocation.

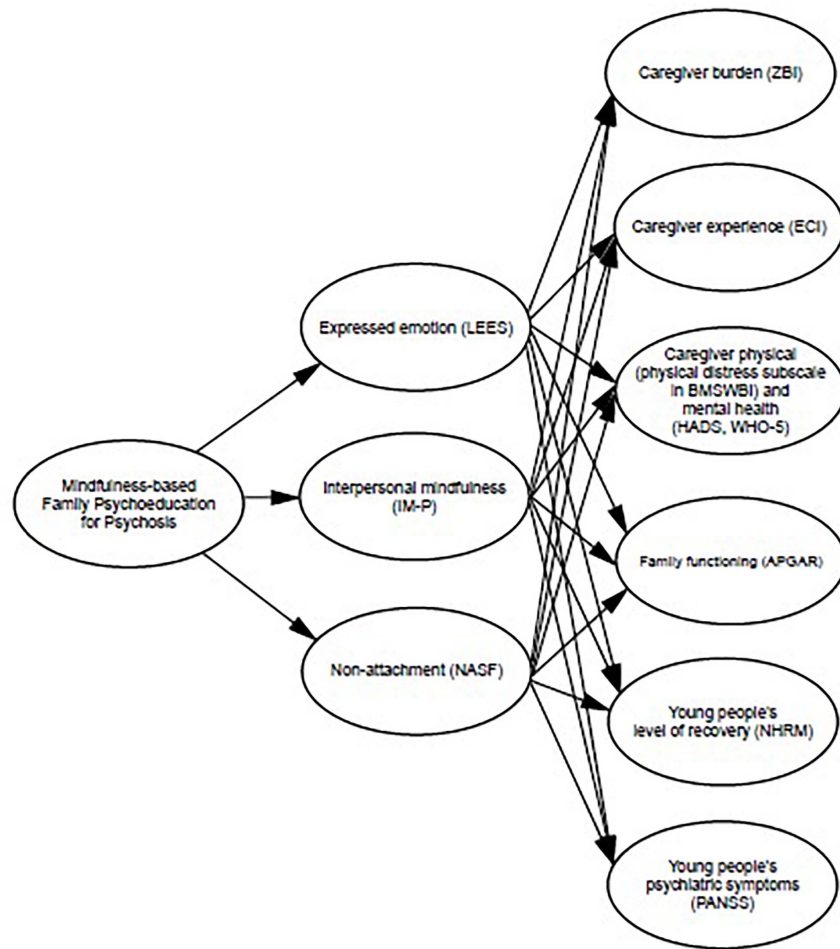


FIGURE 2 | Mediation model.

adults are homemakers, unemployed, or students with no or limited income. Cash coupons should be offered to offset their cost to participate in the study (VanderWalde and Kurzban, 2011). The amount of cash coupon are set within nominal standard according to the living standard in the city that the study is conducted.

Measures

All proposed outcomes, mediators and measures are illustrated in Figure 2.

Primary Outcome Variable

Caregivers' burden

The Zarit Burden Interview is a 22-item measure of caregivers' perceived stress level (ZBI; Zarit et al., 1980). The degree of burden is measured across areas including health, psychological well-being, finances, social life, and relationship with the patient. Sample items include "Do you feel that because of the time you spend with your relative, you don't have time for yourself?" and "Do you feel that you have lost control of your life since your relative's illness?" The caregivers will be asked to indicate the

level of discomfort surrounding this question by choosing an answer ranging from 0 "not at all" to 4 "extremely." The total score range is from 0 to 88. The scale has been validated among caregivers of patients with schizophrenia in Chinese with a high internal consistency (Cronbach's alpha) of 0.88 (Tang et al., 2017).

Secondary Outcome Variables

Caregiving experiences

The Experience of Caregiving Inventory (ECI; Szmukler et al., 1996) will be used to measure the caregiving experiences. Three subscales are selected in relation to the purposes of this study: stigma (e.g., "feeling unable to tell anyone of the illness," five items), effects on the family (e.g., "How his/her illness affects special family events," seven items), and positive experience in caregiving (e.g., "I have discovered strengths in myself," 14 items). The stigma score can range from 0 (no experience of stigma) to 20 (strong experience of stigma). The effects on the family score can range from 0 (no negative effects on the family) to 28 (strong negative effects on the family). The positive experience score can range from 0 (no positive

experience in caregiving) to 56 (strong positive experience in caregiving). ECI has been validated among Chinese caregivers with internal consistencies from 0.75 to 0.85 for selected subscales (Lau and Pang, 2007).

Caregivers' physical health

The 14-item physical distress subscale in the Body-Mind-Spirit Well-Being Inventory (BMSWBI; Ng et al., 2005) will be used to measure caregivers' physical health. It includes symptoms of physical distress such as headache, chest pain, and fatigue. Participants rate their level of physical distress in the past week, from 0 "no distress at all" to 10 "extreme distress." The total score for physical health can range from 0 (no distress) to 140 (high distress). The physical distress subscale of BMSWBI showed a high internal consistency of 0.87 (Ng et al., 2005).

Caregivers' mental health symptoms

The Hospital Anxiety and Depression Scale is selected to measure the caregivers' mental health symptoms (HADS; Zigmond and Snaith, 1983). Caregivers rate their symptoms from 0 "low" to 4 "severe," and the anxiety and depression symptoms score can range from 0 to 21. HADS was validated and the internal consistencies for anxiety and depression subscales were 0.77 and 0.82 respectively (Leung et al., 1999).

Caregivers' well-being

The WHO-5 Well-Being Index (Johansen, 1998) is a well-validated measure of psychological well-being. It includes five positive well-being statements (e.g., "my daily life has been filled with things that interest me"). Caregivers will be asked to indicate their degree of well-being in the past 2 weeks, from 0 "at no time" to 5 "all of the time." The total score can range from 0 to 25, with higher scores indicating a better subjective perception of well-being. The WHO-5 has been validated in a Chinese sample with a high internal consistency of 0.86 (Kong et al., 2016).

Caregivers' perceived family functioning

The Family APGAR Scale (Smilkstein et al., 1982) is a validated 5-item measure of perceived family functioning, with five dimensions of family functioning including adaptation, partnership, growth, affection, and resolve. A sample item is "I am satisfied with the way my family expresses affection and responds to my emotions, such as anger, sorrow, and love." The caregivers are invited to rate their perceived family functioning from 0 "hardly ever" to 2 "almost always." The total score can range from 0 to 10, with higher scores indicating better perceived family functioning. The Family APGAR has been widely adopted in Chinese samples and a high internal consistency of 0.91 was reported in a recent study (Nan et al., 2013).

Caregivers' interpersonal mindfulness

The Interpersonal Mindfulness in Parenting Scale is a measure of interpersonal mindfulness for parents (IM-P; Duncan, 2007). The Chinese version of IM-P is well-validated with four subscales including compassion for child (seven items), emotional awareness in parenting (six items), non-judgmental acceptance in parenting (six items) and listening with full awareness (four items) (Lo et al., 2018). Sample items include "I try to be understanding and patient with my family member

when he/she is having a hard time" and "When my family member does something that upsets me, I try to keep my emotions in balance." The total score can range from 23 to 115, with higher scores indicating a higher level of interpersonal mindfulness in caregiving. The overall internal consistencies of Chinese version of IM-P was 0.85 and those of four subscales are 0.70 and 0.84 (Lo et al., 2018).

Caregivers' non-attachment

The Non-Attachment Scale was developed to measure a general state of being psychologically and socially adaptive (Sahdra et al., 2010). The Chinese short form of the Non-Attachment Scale (NAS-SF) has eight items, and caregivers will be asked to rate each item from 1 "strongly disagree" to 6 "strongly agree" (Chio et al., 2018). A sample item is "I can accept the flow of events in my life without hanging onto them or pushing them away." The total score can range from 8 to 48, with higher scores indicating a higher level of non-attachment, and a high internal consistency of 0.91 was reported (Chio et al., 2018).

Young adult's level of recovery

The Mental Health Recovery Measure (Young and Bullock, 2005) is a 30-item measure of young adults' mental health recovery relating to their experience in psychosis. It provides a comprehensive evaluation of the recovery experience from a young adult's perspective, without measuring psychiatric symptoms. The items cover positive dimensions in recovery including overcoming stuckness, self-empowerment, learning and self-redefinition, basic functioning, overall well-being, new potential, advocacy/enrichment, and spirituality. Each item records the young adult's level of agreement on a five-point scale (1 = totally disagree to 5 = totally agree). Sample items include "The way I think about things helps me to achieve my goals" and "Even though I may still have problems, I value myself as a person of worth." The total score can range from 30 to 150, with higher scores indicating a higher level of recovery, and a high internal consistency of 0.93 was reported in a Chinese scale validation study (Ye et al., 2013).

Young adult's family expressed emotions

The Level of Expressed Emotion Scale (LEES; Cole and Kazarian, 1988) is a validated 12-item measure of family EEs. This measure is based on self-reports from young adults with psychosis, with subscales in criticism (four items), hostility (four items), and over-involvement (four items). Sample items include "My family members often accuse me of making things up when I'm not feeling well" and "My family members insist on knowing where I'm going." The youths will be asked to rate each item on a five-point scale (1 = totally disagree to 4 = totally agree). Criticism, hostility and over-involvement sub-scores can range from 4 (low EE) to 16 (high EE). The three subscale scores are summed to compute a total score for family EEs. A recent Chinese study of LEES reported participants over cut-off points showed a 6.3 times elevated 12-month relapse rate compared with the counterparts (Ng et al., 2019). The internal consistency of the

whole LEES was 0.84 and the three subscales were 0.75 to 0.77 (Ng and Sun, 2011).

Young adult's psychiatric symptoms

The Positive and Negative Syndrome Scale is a measure of psychiatric symptoms (PANSS; Kay et al., 1987; Chen et al., 2005). An independent research assistant with at least 3 years of mental health practice experience will rate the young adult's scores after a clinical interview. The scale includes seven items for positive symptoms (e.g., delusions), seven items for negative symptoms (e.g., blunted affect), and 14 items for general psychopathology (e.g., lack of judgment and insight). The positive and negative symptom subscale scores can range from 7 (less severe) to 49 (very severe). The general psychopathology subscale score can range from 16 (less severe) to 112 (very severe). The internal consistencies of PANSS based on Chinese samples were 0.73 to 0.84 (Chan et al., 2004).

Other behavioral indicators

Caregivers' unplanned medical consultations and young adults' days spent hospitalized will be recorded.

Stepwise Procedures

Program Planning and Training

The themes and content of arms 1 and 2 are summarized in **Table 1**. For MBFPE (arm 1), 1-h mindfulness training is infused with 1-h FPE. For ordinary FPE (arm 2), the entire session is reserved for knowledge and skills about managing psychosis, and for mutual support. Both programs include understanding psychosis, medication, treatment management, mental health service collaboration, attention to caregivers' experiences and distress, strategies for improving communication and problem-solving, and crisis planning, based on best practices for working with psychosis (Froggatt et al., 2007; McNab and Linszen, 2009). Both arms will involve six sessions, with a total contact time of 12 h. Arm 1 includes 10 min of daily mindfulness homework. The research team has produced a psychoeducation video that covers these key topics. It includes mini-lectures by multi-disciplinary professionals including a psychiatrist, a clinical psychologist, two psychiatric nurses, an occupational therapist, several social workers, and sharing from caregivers and peer support workers who are young adults in recovery and have been involved in community education. The video will be supplemented by discussion and sharing for participants. Protocols have been developed and refined based on feedback from instructors, participants, and NGO social workers in the pilot study.

Instructors for arm 1 will require basic professional training in MBI, plus regular personal mindfulness practice and at least 2 years of experience in conducting mindfulness-based programs. Instructors for arm 2 will be mental health professionals with practical experience working with psychosis for over 2 years.

Implementation and Quantitative Data Collection

After the first assessment (T1), caregivers who meet the inclusion criteria will be randomized into an MBFPE (arm 1) or an ordinary FPE (arm 2). After the intervention, participants in both arms will complete the second assessment (T2). Both arms will be delivered

in group format, with 12 to 18 caregivers in each group. Programs will be conducted at NGO service centers or in the psychiatric unit of a public hospital. At 9-month post-randomization (T3) will be offered as a booster and final assessment for both arms.

Intervention Fidelity

To ensure intervention fidelity, all program sessions will be audio-recorded and an independent rater will listen to 20% of the clips (randomly selected) and assess whether each element in the intervention protocol has been implemented consistently. All raters shared same qualifications of the instructors. Higher concordance rates will signify greater fidelity to the intervention protocol, which will be carefully monitored throughout the study. The treatment fidelity of arm 1 will be further assessed using the Mindfulness-based Interventions-Teaching Assessment Criteria Scale (Crane et al., 2012).

Qualitative Data Collection

The embedded mixed-methods design to be used will examine the program outcomes through experimental design and explore the intervention process using the qualitative study method Photovoice. The quantitative data will be used to investigate the outcomes and effectiveness of the MBFPE, and to test whether it can attain positive changes for family caregivers and young adults with psychosis. A supplementary, qualitative, participatory action research method called Photovoice will be adopted to engage the participants to contribute to more candid and in-depth knowledge of the caregiving process, and to explore the "processes" occurring during MBFPE and the follow-up period (Wang, 1999). In the qualitative study, caregivers will contribute to offering a unique contextual understanding of the outcomes, and ideas, insights, suggestions, and questions that have not been adequately addressed in the literature. This will also ensure the internal validity of the intervention (Bryman, 2006).

Photovoice, as qualitative method technique, can facilitate people to record and reflect about their strengths and concerns of about being a caregiver, to foster dialog about the caregiving process and personal experiences with MBFPE, by sharing ideas and discussions about their photos (Wang, 1999; Ho et al., 2011). The procedures include the following: (1) in MBFPE sessions 2 to 5, the Photovoice themes will be included as homework assignments; (2) guidelines will be offered at the end of the sessions and participants will be encouraged to take pictures using their smartphones; (3) participants will write down their reflections on the images and share them in the following sessions, and send their pictures and reflections to the research team; (4) in subsequent sessions, time will be allocated for collaborative enquiry on the pictures and reflections. With the participants' consent, the pictures, reflections, and content of the in-session enquiries will be displayed. All participants will be involved in sharing and commenting on the pictures and reflections, in terms of both mindfulness and caregiving. (5) At T3, all pictures will be re-displayed and the participants will be invited to view their pictures, share additional reflections about their caregiving experience and participation in MBFPE, and highlight their reflections on MBFPE and caregiving.

TABLE 1 | Proposed intervention program outline: content of mindfulness-based family psychoeducation (MBFPE) (arm 1) and family psychoeducation (FPE) (arm 2).

Session themes	Mindfulness-based family psychoeducation (MBFBE) (arm 1)	Family psychoeducation (FPE) (arm 2)
Core process	Non-judgmental, collaborative inquiry, self-care	Knowledge sharing, problem-solving, mutual support
(1) Understanding the impact of caregiving stress	(a) Orientation to the program (b) Mindfulness practice: mindful eating, body scan (c) Video: caregiver's reaction of onset of SMI (d) Discussion: awareness of the impact of caregiving on body and mind (e) Homework: body scan	(a) Orientation to the program (b) Sharing and discussion: stress and reactivity in caregiving (c) Video: caregiver's reaction of onset of SMI (d) Discussion: normalizing the reactions of caregiver stress
(2) The impact of psychosis to young adults	(a) Mindfulness exercises: mindful stretching, mindful walking (b) Inquiry: mindfulness exercises (c) Video show: understanding positive and negative symptoms (d) Homework: mindful stretching, 3 min breathing, and photovoice (a pleasant moment)	(a) Sharing and discussion: issues in handling symptoms and behaviors of family member in recovery (b) Video show: understanding positive and negative symptoms (c) Discussion: strategies on symptom management and promoting recovery
(3) The experience of young adults with psychosis in recovery	(a) Mindfulness exercises: mindful sitting, mindful communication (b) Inquiry: mindfulness exercises and photovoice (c) Video show: sharing of persons in recovery (d) Homework: mindful sitting, 3 min breathing, and photovoice (an unpleasant moment)	(a) Sharing and discussion: goals and needs for holistic recovery (b) Video show: sharing of persons in recovery (c) Discussion on understanding and communicating with family members in recovery
(4) The struggles of caregivers	(a) Mindfulness exercises: mindfulness with difficult moments, mindful communication (b) Inquiry: mindfulness exercises and photovoice (c) Video show: challenges in caregiving and self-care (d) Homework: mindfulness with difficult moments, 3-min breathing, and photovoice (my family)	(a) Sharing and discussion: stress and coping in caregiving, and difficulties in communicating with family members with SMI (b) Video show: challenges in caregiving and self-care (c) Discussion on preventing compassion fatigue
(5) The partnership with multi-disciplinary team in recovery	(a) Mindfulness exercise: be-friending (b) Inquiry: mindfulness exercise and photovoice (c) Video show: understanding treatment and services for adults with SMI (d) Homework: be-friending, 3 min breathing, and photovoice (recovery)	(a) Sharing and discussion: experiences and issues about working with mental health professionals (b) Video show: understanding treatment and services for adults with SMI (c) Discussion on strategies for promoting recovery and partnership with professionals
(6) Review of learning	(a) Mindfulness exercises: body scan, mindful sitting (b) Inquiry: mindfulness exercises and photovoice (c) Video show: relapse plan and management (d) Review: what I learn in the program	(a) Sharing and discussion: risk and relapse management (b) Video show: relapse plan and management (c) Review: what I learn in the program
(7) 9-month post-randomization booster	Review: changes and benefits in mindfulness Inquiry: photovoice	Review: changes and benefits of the program

ANTICIPATED RESULTS

Quantitative Data Analysis Intervention Effects

All analyses will be carried out according to the intent-to-treat approach (Moher et al., 2010). Missing values will be handled with multiple imputation procedure (Sterne et al., 2009). MANOVA will be used to evaluate the effects of the MBFPE (arm 1), relative to the FPE (arm 2), and the primary and secondary outcome measures will be analyzed. In addition to the immediate program effects, the outcomes measured at T2 and T3 will be compared, to assess whether maintenance effects are sustained at 9-month post-randomization.

Priority will be given to caregivers if their young people with psychosis agree to participate in the assessment. It is expected that at least half of the young people will participate in the study. The participation and attrition rates of the young adults will be monitored and analyzed at three time-points. Analysis will be conducted to compare the differences in outcomes between the group with and without young people's participation in terms of their background profile. If any significant difference is detected, implications and limitations in interpretation of the findings will be provided.

Qualitative Data Analysis

The author and the research team will apply grounded theory to analyze the Photovoice images, participants' reflections,

and MBFPE transcripts (Padgett, 2008). Conceptual categories will arise through the data interpretation. The process will encourage the research team to be reflexive about the prior interpretive frames, interests and research context, relationships with participants, and modes of generating and recording empirical materials in the process of analyses (Charmaz, 2006). The team will watch the videotapes of the MBFPE sessions, and study the transcripts of themes, categories, and concepts generated during the Photovoice inquiries. The research team will share these reflections with the MBFPE instructors, and invite the participants to clarify, elaborate upon, and critique the interpretations. Using constant comparative method, the researcher is able to do what is necessary to develop a theory, through categorizing, coding, delineating categories and connecting them. The cycle of comparison and reflection on 'old' and 'new' material can be repeated several times (Boeije, 2002). The first MBFPE session will be coded, followed by the second session, then the coding of the two sessions will be compared. The coding will be added to or altered throughout the study. Theoretical sampling will also be undertaken, to fill gaps in the analyses (Belgrave, 2014).

Collaboration with community stakeholders and the democratization of knowledge construction are strategies for enhancing research credibility for participatory action research (Balazs and Morello-Frosch, 2013). Through the analyses of *Photovoice* that will be contributed by caregivers, the research team members produce ideas of what and how mindfulness has been useful to caregivers to community stakeholders and share responsibility for the advancement of knowledge. Knowledge is constructed and improved by an open, collaborative workspace, and is democratized among caregivers, people with psychosis, mindfulness instructors, mental health professionals, and researchers (Scardamalia, 2002). Social workers from the collaborating NGOs have been involved with the team since the pilot study, helping formulate the *Photovoice* procedure. The participants will contribute to the study by sharing their personal reflections during MBFPE, based on their pictures. During this process, the most salient features of these dialogs will be jointly determined by the instructor and the participants. Transcripts will be recorded and themes identified by the researchers. At T3, all pictures and the preliminary analysis will be discussed with all participants until concurrence on the coding and interpretations is reached between the researchers and participants. The participants will then be able to comment on the analysis findings. Further meetings between the research team members, and additional *Photovoice* sharing sessions for the mental health professionals will help to strengthen the reliability of the qualitative study findings and conclude the data analysis process.

DISCUSSION

Family caregivers play a pivotal role in treatment and recovery of psychosis, as most people have their onset of illness in young adulthood and continue to live with their families. They often take up the caregiving burden without adequate knowledge and

support and studies have shown that over one-third of them experienced significant emotional distress such as depression (Chen et al., 2016). FPE has been reported to have positive outcomes, but many limitations have been identified, such as long duration and intensive design, and emphasis on benefits for patients but not caregivers. There have been calls for a time-limited but more cost-effective FPE program to mitigate their hardship under the looming realities of people with psychosis and their families.

We have developed a brief MBFPE program, to reduce caregivers' burden and promote young adult's recovery. In this study, we will conduct a randomized controlled trial of MBFPE to investigate the effects after intervention and at 9-month post-randomization using multiple outcome measures for both caregivers and young adults in recovery. The study will include multiple sites and 300 family caregivers will be randomly allocated to MBFPE or FPE. Successful completion of the study and confirmation of the hypotheses will contribute to the evidence on the effectiveness of MBFPE and MBIs. The low intensity of the intervention will provide a sustainable treatment option for policymakers, service providers, family caregivers, and other stakeholders. MBFPE may also be considered for common mental disorders such as major depressive disorder and obsessive compulsive disorder, as the caregivers of people with these mental health issues often suffer comparable stress levels (Renshaw et al., 2005; van Wijngaarden et al., 2009).

An additional qualitative approach *Photovoice* is selected to explore the complex family experiences and the benefits of mindfulness from the caregivers' personal perspectives. Caregivers can offer their voices about their burdens and how mindfulness can benefit families, through their involvement in a photo taking activity during the psychoeducation program. In this study, the data collection and analyses of *Photovoice* are embedded in the intervention. Further studies may explore the application of *Photovoice* or image-making activities to understand the impact of MBI.

We predict a major difficulty in the recruitment of young people with psychosis in this study. Some of them may refuse to participate in the study at the first stage and more may dropout in the follow-up period. Analysis will be conducted to compare the differences in outcomes between the group with and without young people's participation in terms of young people's profiles. If any significant difference is detected, implications in interpretation of findings and further studies will be discussed in study report and peer-reviewed publications. On the other hand, research team members and collaborators should be cautious about the mental health status of the young adults with psychosis and explain to them about the meaning of cash remuneration coupon with clarity. Under all circumstances they are free to participate and to withdraw from the study at any time with negative consequences.

ETHICS STATEMENT

Ethical approval for this study has been obtained from the Human Subjects Ethics Sub-Committee of The Hong Kong

Polytechnic University (Reference No. HSEARS20161122002). The research team will explain all information about the study in a briefing session and an information sheet. All participants will be asked to sign on a written consent form.

AUTHOR CONTRIBUTIONS

HL designed the project, obtained the project funding, developed the intervention materials, refined the study protocol, and takes responsibility for the overall coordination of the project. W-CH and EN-SL contributed to designing the qualitative study and will perform the Photovoice data analyses. C-WL will provide consultation with the research team and caregivers, based on his expertise in psychiatry. WM contributed to the study methods and scale measurements. S-MN contributed

to the study methods, based on his expertise in EE studies. SW contributed to the program design and will offer medical advice to the instructors and caregivers. JW, SL, CS-LL, and EC-LL contributed to improving the study design and producing psychoeducation video, recruiting, and implementing the study. MP and KC contributed to improving the protocol, producing the psychoeducation video, recruiting, and implementing the study. CW-CL contributed to producing the psychoeducation video, recruiting, and implementing the study.

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Decoupling Internalized Dysfunctional Attachments: A Combined ACT and Schema Therapy Approach

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In the field of attachment research, parental behavior has been described in terms of caregiving behavioral systems, expressed in specific relational patterns. These patterns are meant to provide assurance and comfort for the infants to promote exploration and autonomy by ensuring a “secure base” to return to Bowlby (1988). In case of stressful situations for the child, the prototypical behavior of caregivers is to ensure protection and responding with emphatic emotions. However, not every parent is equally skilled and motivated to be an effective caregiver and individuals may differ in their caregiving-related behaviors. In some cases, caregivers are not able to provide protection for their child and/or they may respond with dysregulated emotions.

According to attachment theory, such individual differences can be attributed to *mental representation* of the self and the others (or *Internal Working Models* as Bowlby defined them). Caregivers’ mental representations of their child and of the self as caregiver influence their behavior, leading to different relational patterns with their children (Solomon and George, 2008). For instance, George and Solomon (1989, 1996), showed that mothers of secure children have positive representations of the self as caregiver as they perceive themselves as effective and caring, together with a positive and realistic perception of their child. In contrast, mothers of avoidant children have more negative representations of the self as caregiver, and they tend to devalue their child’s attachment needs. Mothers of ambivalent children are characterized by uncertainty and confusion, and they tend to promote the dependency of their children. Last, but not least, mothers of disorganized children abdicate caregiving considering themselves as helpless and unable to protect their child (George and Solomon, 1996). Caregivers’ mental representations is a very critical aspect in parent-infant relationship, because internalized dysfunctional attachments in parents (in the form of representations) may generate negative expectations and emotions about self and others, and drive maladaptive coping responses (McKay et al., 2012). Unfortunately, these mental representations are transmitted from one generation to the other (Bretherton, 1990). In this paper, we suggest a methodology to stop the repetition of past dysfunctional relational patterns, and assist the parent in developing new caregiving abilities.

Third wave psychotherapy approaches offer interesting tools for the intervention on internal representations. For instance, these approaches can limit the influence of negative past representations toward significant others in current relationships (Simeone-DiFrancesco et al., 2015). We make the point that this consideration applies to parenting style as well. We propose a two-steps procedure based on the integration of Schema Therapy (ST; Loose et al., 2013; Young et al., 2013; Simeone-DiFrancesco et al., 2015), and techniques derived from Mindfulness (Van Vreeswijk et al., 2016), and Acceptance and Commitment Therapy (ACT; Hayes et al., 1999). This integration stems from the fact that these approaches have, in our opinion, complementary

strengths. On one side, ST provides the conceptual background for an understanding of what is enacted in the current relationship, say a Dysfunctional Parent Mode (e.g., Punitive, Demanding, Critic parent...), coming from past internalized relationships. Therapists may refer to the concept of *enactment of specific Modes* to help caregivers become aware of roles and relational themes displayed during the interactions with their children. ACT and mindfulness, on the other hand, have outlined a series of strategies by which clinicians can help the client to attend, observe and stop automatic reactions to dysfunctional mental representations. A combined ST and ACT approach aims to relieve parenting-related difficulties, through the understanding and the limitation of enactments in the parent-child relationship. Previous contributions have considered the integration between ST and ACT or mindfulness approaches, without a specific focus on parental skills (see for example the integration of Schema therapy with mindfulness by Van Vreeswijk et al. (2016); or the incorporation of acceptance-based concepts into Schema therapy by Farrell and Shaw (2017)). These approaches outline effective methods to manage emotional experience in the present moment and to reduce reactivity to dysfunctional emotional schemas (Van Vreeswijk et al., 2016). Moreover, Loose and colleagues (Loose et al., 2013) have proposed a modified version of Schema Therapy (ST), specific for children and adolescents. Although parents are sometimes involved during the therapy, this model focus on children, whereas the issue of helping parenting is only briefly discussed. In contrast to such mentioned models, our discussion is specifically focused on parents, and integrate ST and other third wave approaches.

The first step of the methodology we propose is pathological modes identification. In Schema Therapy terminology, internalized dysfunctional attachments can be described as coupled *Dysfunctional-child-modes* (DCM, for example, Angry Child, Impulsive Child), with *Dysfunctional-parent-modes* (DPM, for example, Punitive Parent, Demanding Parent, Critic Parent), eventually managed with *Dysfunctional-coping-strategies* (DCS, for example, detached protector, overcompensating modes, or compliant surrender modes). In daily life, the activation of dysfunctional modes negatively influences parents' attitudes and behaviors toward their child. This is because DCM and DPM are associated with either (1) dysregulated emotions, or with (2) dysregulatory mechanisms (Dadomo et al., 2016, 2018). DPM are the primary source of dysregulated emotions and reflect pathological aspects of the parent that are enacted inside the relationship. In terms of emotion regulation, these DPM are dysregulatory mechanisms that generate the most severe dysregulated emotions in the parent (for example, a Punitive Parent Mode that induces in the child self-hate and contempt toward the self). DCM, as a consequence, are characterized by specific dysregulated emotions (Angry Child = anger, Lonely Child = sadness, Anxious Child = fear). DCM develop when certain basic emotional needs are not adequately met in childhood. To complete the picture, DCS are pathological *regulatory mechanisms* that paradoxically increase dysregulation in the long run.

Based on concepts derived from Schema Therapy (Loose et al., 2013; Young et al., 2013; Simeone-DiFrancesco et al., 2015; Van Vreeswijk et al., 2016), step 1 helps parents become aware of their internal representations (DPM-DCM), and the pathological strategies they use (DCS) when they activate. This can be achieved as follows:

- a) Detection of pathological modes by interviewing parents, or by using self-administered questionnaires (Young Parenting Inventory, Schema Mode Inventory, etc). This is the first step to make explicit relational patterns that are driving dysfunctional parent modes and causing distress to their children.
- b) Psychoeducation on specific DPM-DCM, providing information concerning how individuals enact past patterns into their parental relationships. Examination of specific daily life examples may be useful at this step. This may help clients develop awareness on how they enact problematic ways of relating to their children.
- c) Examination of the negative consequences of enacting these modes (DCS) into the parent-child relationship. With this aim, chair work with an empty chair representing the child may promote parents' awareness of DCS and their consequences for the child.
- d) Identification of values. This aspect regards the clarification of the kind of parent our patient wants to become. Since values drive patients' behaviors, such clarification may provide a guide and motivation to try new responses. The work on values can also help modifying internal mental representations of the self as parent.

At the end of this phase, we expect the client to be much more aware of her/his DPM. However, an additional phase to reduce DCS and to develop new strategies is necessary. With this aim, we now turn to step 2, taking into consideration third wave cognitive therapies. In step 2, the clinician helps the parent to reduce DCS by using mindfulness and ACT to reduce over-reactivity. We suggest the following steps, as a methodology to promote a change regarding how parents relate with their modes:

- a) Mindful exposition and observation (without acting) of DPM and the emotions and action tendencies associated. This encourages parents to attend and reflect on pathological experience. Simulations and imagery techniques can greatly help the parent to activate DCS.
- b) Once activated, exposure plus a non-judgmental stance as prescribed by mindfulness and ACT theorists, may help containing the emotional experience. Acceptance and non-reactivity attitude rather than enacting the DCS in response to the child's needs is fundamental to break the cycle. This aspect helps parents in creating a place to reflect on their automatic reactions without enacting them. Research suggests that acceptance decreases avoidance and increases valued actions (Twohig, 2007).
- c) Take the distance from modes. Techniques developed by ACT are useful to take distance from DPM. An example is defusion, a technique based on "looking at thoughts rather than from

thoughts.” This may greatly help parents to disengage from automatic responses (DCS).

- d) Valued and committed actions application (according to values as proposed by ACT). Committed actions are values-based actions that may replace old DCS. This final part is the heart of step 2 and it help parents in developing new relational patterns. Chair work and simulation can be very helpful for the development of new relational patterns and for the exploration of positive effects of new behaviors (such as, more caring and protective behaviors in parent-infant relationship).

In sum, in the present opinion paper, we provided insights and technical advice on how to help parents to become aware of and to detach from dysfunctional ways of relating with their children. Although we do not have yet empirical data to support our model, we believe it is a promising approach to help parenting, as it is strongly grounded in therapy models whose efficacy has been demonstrated (see for example, Hacker et al., 2016; Taylor et al., 2017). Moreover, some preliminary studies on the integration between ST and ACT or mindfulness-based approaches (Amaro

et al., 2010; Gojani et al., 2017), suggesting that the approach described here are probably efficacious.

Specifically, Amaro et al. (2010), designed a Spiritual Self-Schema as an 8-session mindfulness-based intervention to target addiction problems and human immunodeficiency virus (HIV) risk. Preliminary results showed high rates of Spiritual Self-Schema acceptability and positive changes in a number of outcomes relevant to recovery from addiction and to HIV prevention. More recently, Gojani et al. (2017) demonstrated similar and synergic effects of both schema- and mindfulness-based therapies on maladaptive schemas in improving the psoriasis patients with the psychopathologic symptoms. Future studies are needed to provide efficacy data on this combined ST and ACT approach for improving parenting.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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