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ORIGINAL PAPER

The effect of Mindful Parenting Training on Parent–Child Interactions, Parenting Stress, and Cognitive Emotion Regulation in Mothers of Preschool Children

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Abstracts

A growing body of evidence that supports the efficacy of mindful parenting as a suitable intervention technique to foster parenting skills and reduce the risk of parental stress. However, most of the progress has been limited to parents with children with disabilities, and there is little evidence about the effect of mindful parenting intervention involving non-clinical populations. This study aimed to examine the effects of an 8-week Mindful Parenting Training (MPT) on parenting stress, Parent–Child interactions, and cognitive emotion regulation strategies among mothers of typically developing preschool children. Forty mothers with high-stress levels according to Parenting Stress Index (PSI) were randomly assigned to a Mindful Parenting Training (MPT) group ($n = 20$) and a sham control group ($n = 20$). Questionnaires were administered at pretest, posttest, and eight weeks follow-up. A significant improvement was seen in parental stress, Parent–Child interactions, as well as adaptive cognitive regulation strategies in the MPT group compared with the sham control condition with large effect sizes. Moreover, maladaptive cognitive emotion regulation strategies and conflicts associated with mother-child interactions decreased. All changes were maintained up to 2 months after the intervention. The results provide strong evidence that mindful parenting training is a valuable intervention for mothers referred to mental health care because of parenting stress, problems in Parent–Child interaction, and maladaptive cognitive-emotion regulation strategies.

Keywords Mindful parenting training (MPT) · Parent–Child interactions · Parenting stress · Cognitive emotion regulation · Preschool children

Highlights

- Mindful parenting may improve adaptive cognitive emotion regulation among mothers of typically developing preschool children.
- Mindful parenting may have an impact on the Parent–Child interaction.
- The results indicate an effect of mindful parenting on self-reported parenting stress.

Parent–Child interactions are rooted in activities in everyday life, and due to the many opportunities they provide to facilitate the child's development, they have been the focus of research (Daunhauer et al., 2017). These interactions are basically built upon several key factors, including parental attitude and acceptance, behavioral management, emotion regulation, parenting skills, and an environment with minimal conflicts (Havighurst et al., 2010). Nevertheless, the Parent–Child interactions can easily be affected by various psychosocial and sociodemographic risk factors that weaken their quality and, in turn, negatively impact the child's long-term mental health (Choe et al., 2013; De Falco et al., 2014). Parenting stress is another factor that could adversely affect these interactions and parenting styles. For example, in a study, Xu et al. (2005) examined the relationship between Parent–Child interactions and

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parenting styles among 97 Mainland Chinese mothers. They found that parenting stress was positively associated with authoritarian parenting.

Parenting stress is a psychological reaction that arises when there is an obvious discrepancy between the resources needed for parenting tasks and the capability to cope with them (Abidin, 1990). Parenting stress is technically different from other types of stress such as financial distress, work-related pressures, and negative life events (e.g., the loss of a loved one) that a parent might deal with (Holly et al., 2019). This kind of stress is typically rooted in marital problems (maladaptation in spouse relationship), unintended changes in the family (divorce, death of a member), mental or physical disorder of the parent or child, an imbalance between roles in the workplace and at home (Möller et al., 2015). According to Berry and Jones (1995), parenting stress has two major components: pleasure and strain. The pleasure component happens when parents feel secure in their roles and express more affection and joy. Also, in this phase, they experience a lower level of parenting stress (Zelman & Ferro, 2018).

On the other hand, the strain component is attributed to the shortage of resources such as time and energy to implement their parental roles, which results in a high level of parenting stress (Zelman & Ferro, 2018). Untreated parenting stress can lead to depression and anxiety (Townshend et al., 2016), lower physical and psychological health (Limbers et al. 2020), poor family functioning, and inappropriate parenting in general (Bögels et al., 2010; Gouveia et al., 2016). Furthermore, studies have shown that behavioral problems in children are significantly associated with parenting stress and vice versa (Neece et al., 2012). This vicious cycle of increased levels of parental stress and behavioral problems in children may adversely affect the quality of Parent–Child interactions and the security of their relationships (Ciciolla et al., 2014; Lewallen & Neece, 2015). Therefore, managing parenting stress is essential for parents and their children (Burgdorf et al., 2019). Although parents have different capacities to deal with stress and negative emotions (Potharst et al., 2019), learning adaptive strategies can be a fundamental ability for them to regulate their emotions rather than getting overwhelmed by them (Garnefski et al., 2001).

Cognitive emotion regulation (CER) denotes an individual's thoughts after experiencing emotionally charged information (Garnefski et al., 2001). According to Garnefski et al. (2001), there are nine cognitive-emotional regulation strategies which categorized into adaptive and maladaptive strategies: self-blame, referring to focusing on thoughts and feelings tied with guilt; other blame, illustrates thoughts in which guilt is attributed to others for the experienced situation; rumination, which involves constant dwelling on the feelings and thoughts associated with negative event; catastrophizing: referring to thoughts of explicitly intensifying the severity of the experienced situation; putting into perspective: which implies brushing aside the intensity of current event through comparing it to other events; acceptance, refers to thoughts about resigning yourself to what has happened and accept that event; positive refocusing: which involves thinking about joyful and pleasant issues rather than the actual events; refocus and planning, referring to focusing on thoughts about how to manage the negative events experienced; positive reappraisal, which means understanding the negative event as an opportunity for self-development (Rodríguez et al., 2020). The purpose of these strategies is to change the person experiencing the emotion (internal) or the change in the other person (external), such as when parents help their children adjust their emotions (Rutherford et al., 2015). Some studies have demonstrated that parenting intervention programs effectively reduce maladaptive cognitive emotion regulation strategies, stress, anxiety, and postpartum depression (Choi et al., 2021). Besides, parents need to raise their awareness regarding the parenting process to manage their stress and negative emotions (Bögels et al., 2010).

Giving full attention to the parenting process is a concept known as mindful parenting. The idea of applying mindfulness to parenting was initially outlined by Kabat-Zinn and Kabat-Zinn (1997), who defined mindful parenting as a quality of consciousness involving present-centered, non-judgmental attention and awareness of every interaction and moment with the child.

Several models of mindful parenting have been proposed (Bögels et al., 2010; Duncan et al., 2009). They were based on the premise that psychological modifications regarding the interpersonal and interpersonal interactions during mindfulness training are unavoidable (Haydicky et al. 2017). For example, Bögels's model (2010) for mindful parenting consisted of several mechanisms for Parent–Child interactions. They presumed that reducing parental stress, anxiety, and depression can positively influence parenting skills and increase the sense of fulfillment in parents while alleviating the level of preoccupation and rumination will result in notable coordination and reinforcing the Parent–Child attachment (Haydicky et al., 2017).

A series of studies performed by Bögels and Restifo (2014) revealed that mindful parenting has substantial clinical implications for a wide range of parenting, mindfulness, and child care practices, as well as parental psychopathology. In addition, such impacts have been observed in several studies for parents of children with autism, ADHD, and other developmental disabilities after the implementation of mindfulness intervention (Conner & White, 2014; Gau & Chang, 2013; Neece, 2014; Neece et al., 2019; Van der Oord et al., 2012).

Hence, incorporating mindfulness-based approaches to parenting is an innovative application of mindfulness to

address mental and physical health-related problems and parenting stress, as well as enhance the quality of Parent–Child interactions (Bögels & Restifo, 2014; Chaplin et al., 2018; Coatsworth et al., 2015; Duncan & Shaddix, 2015; Singh et al., 2010; Tomlinson et al., 2018; Townshend et al., 2016; Turpyn & Chaplin, 2016). Similar studies asserted that parenting training for parents of preschool children significantly reduced parenting stress and inappropriate emotional behaviors by controlling and regulating parental emotions (Havighurst et al., 2010; Wilson et al., 2012). Although the effects of these studies are promising, they did not include the assessment of Parent–Child interactions to evaluate the impact of the intervention on these interactions. Additionally, outcomes were not assessed immediately after the intervention, so it is unclear whether outcomes at follow-up faded over time, remained stable, or strengthened over the course of the study. We chose mindful parenting training in the current study for two main reasons. Firstly, theoretical work illustrates that a mindful approach to parenting may help change the entrenched patterns of poor interactions between parents and their children by using the techniques they learn in the MP program (Dumas, 2006; Duncan et al., 2009). Secondly, according to recent empirical projects, mindfulness-based interventions with parents represent promising results in modifying parents' thoughts and emotions about parenting and Parent–Child interactions (Bögels et al., 2010; Coatsworth et al., 2010; Harnett & Dawe, 2012).

Since most studies about the mindful parenting and parenting stress have focused on parents who have children with disabilities, there is a lack of research examining early prevention in non-clinical samples. Given the importance of referring children to specialized mental health care centers at the beginning of elementary school, the value of early prevention education programs becomes more apparent. It should be noted that this study emphasizes maternal stress because mothers are usually more involved in parenting and are more vulnerable to parental stress than fathers (Kim & Choi, 2015). In this study we aim to evaluate the effect of mindful parenting training on parenting stress among mothers of typically developing children in a non-clinical context. Also, we expected that MPT program would enhance the quality of Parent–Child interactions and mothers' cognitive-emotional regulation strategies.

Method

Participants

The sample was 40 mothers (Mean age = 35.96, SD = 5.23) of at least one typically developing preschool child (Mean age = 6.21, SD = 1.69), 20 in the intervention group and 20 in the sham control group. Concerning the level of education, 25% of the participants had a high school Diploma, 47.5% had a Bachelor's degree, and 27.5% had a Master's degree. All participating mothers signed informed consent. The inclusion criteria were as follows: mothers must have at least one child aged 3–6 years, children with no divorced parents, mother's education should be at least a high school diploma, elevated level of parenting stress in mothers, there should be no physical or mental disability among mothers and their children and also they should not be diagnosed with a behavioral problem or clinical disorder. The exclusion criteria were considered: parents' addiction, severe marital conflicts at home, and parents' physical and verbal maltreatment of children. The ethics committee of the Ferdowsi University of Mashhad approved the study and written informed consent from all parents was obtained. The study was conducted in accordance with the 1964 Helsinki Declaration. There were no statistically significant differences between the groups on demographic variables (child/mother age, child gender, or mother's education).

Measures

Parenting stress index (PSI)

The PSI is a 120- item self-report index measuring stressors within the child and parent domains for assessing the presence of parenting stress among caregivers of young children aged 12 years and younger as conceptualized in Abidin's Parenting Stress Model (Abidin, 1983). Parents rated each item on a 5-point Likert ranging from 1 (*totally agree*) to 5 (*totally disagree*). Forty-seven items measure the Child Domain Stressors (Distractibility, Adaptability, Reinforcement, Demandingness, Mood, and Acceptability). For instance, 1 item to assess child adaptability is: "It seems my son (daughter) is a little bit different from what is expected, and this bothers me sometimes." Fifty-four items measure the seven stressors within the Parent Domain (Competence, Isolation, Attachment, Health, Role Restriction, Depression, Spouse support). An item, for example, to assess parental attachment is "I expected to have closer and warmer feelings for my child than I do, and this bothers me." Nineteen items of the optional scale measure life stress. Domains' scores are summed to a Total Stress score, with a higher score indicating higher parenting stress (Golfenshtein et al., 2022). The scores of child domain, parental domain, life stress index, and total stress were recorded separately. For the child domain, parental domain, and total stress scores, the percentile values were calculated based on the standardized percentile table according to children's age (provided by Abidin), and the resulting percentile values were used in statistical calculations instead

of index scores (Soltanifar et al., 2015). The PSI has been shown to have adequate reliability as well as validity. The Cronbach's alpha for the parental domain total score was from 0.83 to 0.86, and for the overall score in the child domain was from 0.8 to 0.84.

Parent–Child relationship scale (PCRS)

It is a 33-item self-report instrument first developed by Pianta (1994) to measure parents' perception of their relationship with their child. The scale includes three subscales: closeness (10 items), conflict (17 items), and attachment (6 items). Its scoring is based on a 5-point Likert scale which includes responses ranging from "*totally not applicable*" (1) to "*totally applicable*" (5). The score of each scale is obtained from the sum of the items, and the negative statements in the scale (conflict and attachment) are scored adversely. In the present study, we considered the positive aspect of the relationship (closeness). Higher scores indicate warmer parental relationships. Cronbach's coefficients for closeness, conflict, and attachment factor were reported by Driscoll & Pianta (2011) at 0.75, 0.74, and 0.69, respectively. Also, Cronbach's coefficients for Iranian parents were 0.84, 0.70, and 0.61, respectively, for each subscale (Abareshi et al., 2009).

Cognitive-emotion regulation questionnaire (CERQ)

It is a multidimensional questionnaire established by Garnefski and Kraaij (2007) to recognize the cognitive emotion regulation approaches (or cognitive coping policies) someone utilizes after experiencing negative events or conditions. Within the CERQ, nine theoretical and empirical cognitive emotion regulation strategies were renowned, including other-blame, self-blame, catastrophizing, rumination, positive refocusing, putting into perspective, positive reappraisal, refocus, and acceptance and planning. The CERQ is a self-report questionnaire and has 36 items. Scale scores range from 1 (*almost never*) to 5 (*almost always*). The score of each strategy is obtained through the sum of the scores given to each of the phrases that make up that strategy, and it can be in the range of 4 to 20, and the sum of the total scores is in the range of 36 to 180. The psychometric properties of the Farsi version of CERQ were investigated in a sample of 420, and Cronbach's alpha coefficients ranged from 0.66 to 0.88, showing good reliability (Hasani, 2010).

Procedure

Among parents referred to the polyclinic of the Ferdowsi University of Mashhad, those who experienced stress or difficulties in their Parent–Child interactions, were invited to participate in this study in the summer of 2018. In the initial meeting, the MPT program was explained in detail to potential research participants so that they could make an informed decision. After which, they were given additional explanations about the process and the fact that they would be asked to answer several questionnaires in three shifts: immediately before and after the intervention and two months later for follow-up. This information was provided orally and through informed consent. At the end of the session, women interested in participating completed a set of pre-intervention questionnaires.

In the first step, behavioral problems and clinical disorders were evaluated through semi-structured interviews, which were led by a clinical psychologist in the policlinic of Ferdowsi University. The parenting stress index (PSI) was then administered to assess mothers' stress levels before the study. Of 72 females completing the PSI, 43 (60%) represented an increased level of parenting stress (score ≥ 260), 16 (22%) did not meet inclusion criteria, and 13 (18%) declined the invitation due to the summer vacation or pregnancy. Forty-three subjects with elevated levels of parental stress were eligible for inclusion in the current study and were invited by phone. Before the intervention, 3(4%) of 43 mothers refused to continue participating in the study. Thus, 40 mothers were randomly assigned to either the MPT or sham control group ($n = 20$ per group). The contributors were assessed before and after the training program and at the 2-month follow-up (See Fig. 1).

Participants of both groups completed the CERQ and PCRS at the pretest stage. In order to eliminate interfering factors in the process of questionnaire implementation, all the tests and data collection were conducted inside the clinic in three stages: pretest, posttest, and follow-up.

Furthermore, in each stage, the clinical psychologist and her assistant were present to avoid possible questions and ambiguities related to the questionnaire items. Parents were asked to consider their child when filling out the questionnaires and to answer the questions according to the challenges they have with their child. The MPT group received eight sessions (120 min each), considering that definite conditions could lead to extra required time (like sickness or vacation). Eight sessions of English grammar training were provided to the sham control group once a week. However, participants in the sham control group were assured that they would have a training package for mindful parenting techniques, meditation, and yoga practices at the end of the intervention.

This 8-week period was after a pretest evaluation for the MPT and the sham control groups. The follow-up assessment was the last evaluation for both groups after two months.

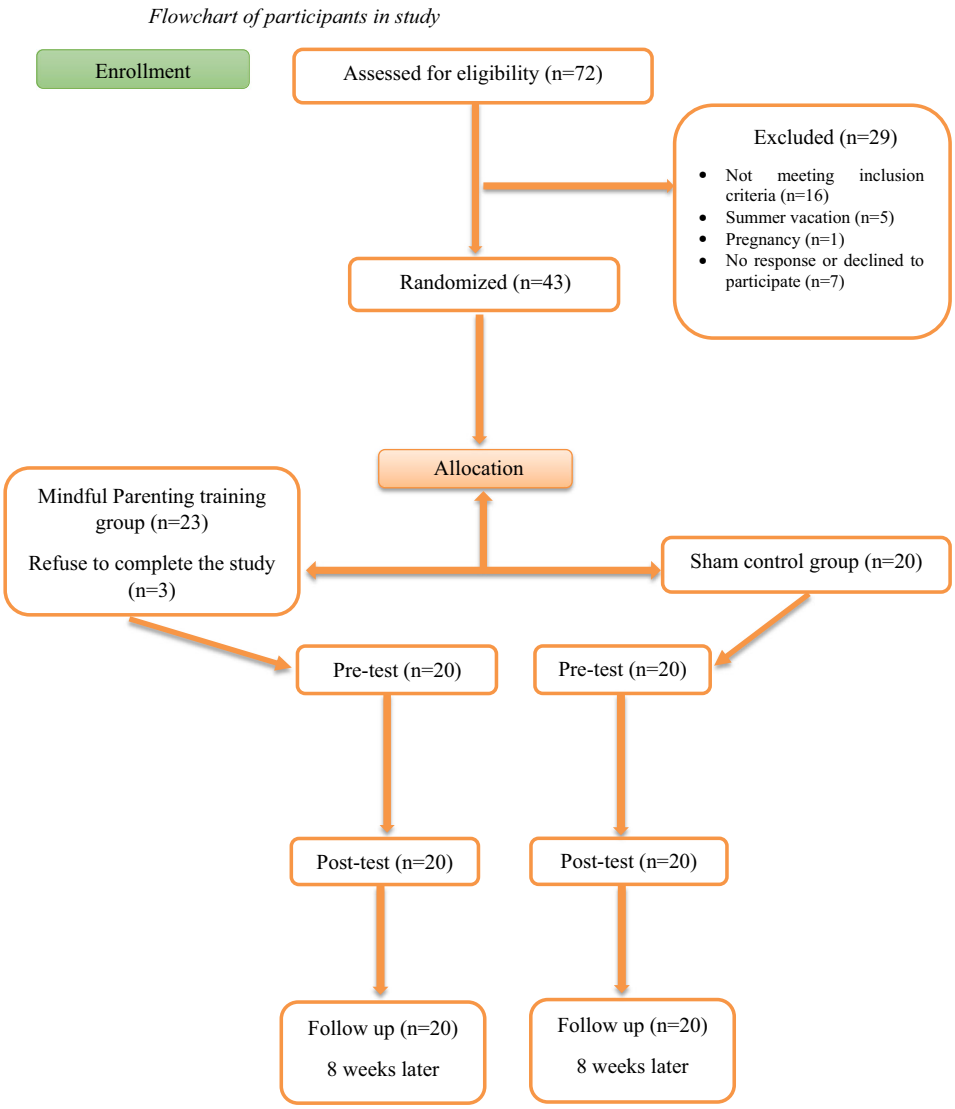

Fig. 1 Flowchart of participants in study

Intervention

The preventative intervention was basically inspired by the mindful parenting model Bögels and Restifo first introduced in 2014; however, it was adjusted in the non-clinical context. The initial plan was to perform all the formal meditation practices which were introduced in the MPT sessions, including the body scan; mindfulness of the breath, sound, body, and emotions and thoughts; mindful seeing; choice less awareness; yoga, and mindful walking (Bögels & Restifo, 2014). However, some practices such as sitting meditation and 3-min breathing were taught to be practiced at home. The MPT course consists of 8 weekly sessions of approximately 120 min and a 2-hour follow-up session two months later.

Two locations in the polyclinic of Ferdowsi University were prepared for the intervention group ($n = 20$) and the sham control group ($n = 20$). Details about the intervention content are available elsewhere (Bögels et al., 2010). In short, each session were structured in the following format: (1) a weekly theme, introduced by a mindful parenting instructor in video format, (2) formal meditations and exercises (3) other exercises, such as visualization (4) advices about how to deal with inconveniences during the exercises, (5) exercises for daily practice at home. After completing an exercise, mothers were invited to write about their experiences. During the training, parents learn to be aware of their own experiences, as well as when interacting with their children. In addition, parents learn to recognize stress signals in themselves and apply short-term mindfulness exercises in moments of stress. In addition, including 10 min of break time throughout each session was an excellent opportunity for members to interact and practice mindful drinking and eating. Finally, participants received a final meditation in the last 10 min of each session and practiced the learned techniques.

The intervention sessions were performed by a clinical psychologist who received intensive training courses and workshops for mindfulness-based therapies and mindful parenting at the Ferdowsi University of Mashhad, led by experts in this field and an experienced assistant in group therapy intervention. An outline of the MPT program is displayed in Table 1. Mothers participating in the sham control group were contacted directly through the polyclinic. It is important to note that participants in the sham control group did not attend the introductory session. They participated in the same time periods to answer the same questionnaires as the intervention group. According to mothers' own desire to improve their level of English, in this group participants were taught grammar by an English instructor. Participants in the sham control group did not receive any compensation for completing the measures, and did so only with the motivation to participate and being helpful.

Data Analyses

Prior to the data analysis, missing data (i.e., dropout and missing item responses for outcomes) were examined. No participants were lost in the MPT and sham control conditions. MPT and sham control groups were compared on demographic factors. Independent t-tests and chi-square tests were performed to analyze continuous and categorical data variables. Repeated measures ANOVA, with time (pretest, posttest, and follow-up) as the within-subject variable and group (MPT group and sham control group) as the between-subject variable, was used to detect the effects of time, group, and time × group interactions for each of the outcome measures variables including PSI, PCRS, and CERQ scores (adaptive and maladaptive strategies). In the case of significant results, effect sizes and observed power were calculated. The statistical significance for all tests was set at 0.05. Partial Eta-squared ($\eta 2$), which measures the proportion of overall variances (main effects and error), was used to determine and interpret the effect sizes: small effect = 0.01; medium effect = 0.06; and large effect = 0.14 (Richardson, 2011). The statistical analyses were performed utilizing IBM SPSS V.24 for Windows. Power analysis was performed using G*Power version 3.1.9.6 for windows.

Results

The demographic characteristics of the participants are displayed in Table 2. Based on the analyses, no significant differences in demographic characteristics with respect to child age, maternal age, gender, and mother educational level were detected between the MPT and sham control groups.

Table 3 presents the means and standard deviations for each outcome measure, including parenting stress, mother-child interaction, and cognitive emotion regulation strategies, at three different time points (pretest, posttest, and follow-up) for the MPT and sham control groups (Fig. 2).

The Kolmogorov-Smirnov test is used to test the null hypothesis that a set of data comes from a normal distribution, and the results for all variables suggested no apparent violation of the assumption ($p > 0.05$). Results indicated that there is a significant pre-post-follow up treatment gains in PSI scores from pretest ($M = 294.1$, $SD = 17.57$) to posttest ($M = 226.7$, $SD = 9.2$) and follow-up ($M = 227.05$, $SD = 11.34$). Significant group-by-time interactions were found for PSI total score ($F = 63.83$; $P < 0.001$, 95% CI [221.69, 304.22]), with a large effect size ($\eta 2 = 0.64$), which indicates a significant improvement in the MPT group. Also, significant pre-post-follow up treatment gains were found in PCRS scores from pretest ($M = 105.8$, $SD = 8.79$) to posttest ($M = 120.55$, $SD = 8.57$) and follow-up ($M = 119.4$, $SD = 7.5$). Significant group-by-time interactions were found for PCRS total score ($F = 36.3$; $P < 0.001$, 95% CI [101.5, 124.36]) with large effect size ($\eta 2 = 0.53$). (See Table 3).

There were significant pre-post-follow up treatment improvements across measures of adaptive strategies (positive refocusing, acceptance, planning and refocus, putting into perspective, and positive reappraisal) from pretest ($M = 53.55$, $SD = 9.73$) to posttest ($M = 76.6$ $SD = 6.8$) and follow-up ($M = 70.3$ $SD = 6.62$). Significant group-by-time interactions were found for CERQ-adaptive strategies total score ($F = 52.14$; $P < 0.001$, 95% CI [48.7, 80.47]) with large effect size ($\eta 2 = 0.63$). In addition, results showed significant pre-post-follow up treatment gains in CERQ- maladaptive strategies total score (catastrophizing, self-blame, other-blame, rumination) from pretest ($M = 45.6$, $SD = 6.86$) to posttest ($M = 35.25$ $SD = 3.79$) and follow-up ($M = 36.6$ $SD = 4.01$). Significant group-by-time interactions were found for maladaptive strategies ($F = 50.94$; $P < 0.001$, 95% CI [34.06, 48.93]) with large effect size ($\eta 2 = 0.63$) (See Table 3).

Discussion

The study aimed to evaluate the effect of mindful parenting training for mothers with typically developing preschool children experiencing parenting stress. While mindful parenting training was provided for the intervention group, the sham control group received English grammar training over eight weeks within the study. The core findings of the current study were that the symptoms of elevated levels of parenting stress among mothers

Table 1 Descriptions of the MPP (Bögels and Restifo 2014)

Session Title	Themes	In session formal practices	In-session mindful parenting exercises	Home Practices
1. Automatic pilot parenting	∘Rationale (nonreactive parenting) ∘Automatic pilot ∘Doing versus being mode	∘Body scan ∘Raisin	∘Morning stress exercise	∘Body scan ∘Child as raisin ∘Mindful routine activity ∘Mindful 1st bite
2. Beginner's mind parenting	∘Seeing child with beginner's mind ∘Attitude of kindness ∘Obstacles to practice ∘Expectations and interpretation	∘Body scan ∘Sitting meditation: breath ∘Seeing meditation	∘Morning stress from perspective of a friend ∘Gorilla video ∘Gratitude practice	∘Body scan ∘Sitting meditation: breath ∘Mindful routine activity with your child ∘Savoring pleasant moments calendar
3. Reconnecting with our body as a parent	∘Body sensations ∘Awareness of pleasant events ∘Watching the body during parenting stress	∘Yoga (lying) ∘Sitting meditation: breath and body ∘3-min breathing space	∘Exploring bodily reactions ∘to parenting stress ∘Imagination parenting stress: self- compassion	∘Yoga (lying) ∘Sitting meditation: breath and body ∘3-min breathing ∘Mindful activity with child ∘Stressful moments calendar
4. Responding versus reacting to parenting stress	∘Awareness and acceptance of parenting stress ∘Grasping and pushing away ∘How thoughts exacerbate stress ∘Responding rather than reacting to stress	∘Sitting meditation: breath ∘body, sounds and thoughts ∘Yoga (standing) ∘3-min breathing	∘Fight–flight–freeze–dance ∘Imagination parenting stress + 3-min breathing + doors	∘Yoga (standing) ∘Sitting meditation: breath, body, sounds and thoughts ∘3-min breathing under stress ∘Parenting stress calendar with 3-min breathing ∘Autobiography
5. Parenting patterns and schemas	∘Recognizing patterns from own childhood ∘Being with strong emotions ∘Awareness of angry and vulnerable child modes and punitive and demanding parent modes	∘Sitting meditation: breath, body, sounds and thoughts, emotions ∘Walking meditation inside	∘Pattern recognition exercise ∘Holding strong emotions with kindness	∘Sitting meditation: breath, body, sounds and thoughts, and emotions ∘Walking meditation ∘3-min breathing when your child is behaving … ∘Parental stress calendar + schema mode recognition
6. Conflict and parenting	∘Perspective taking, joint attention ∘Rupture and repair ∘Tuning in to your child's emotional states	∘Sitting meditation ∘Choice less awareness ∘Walking meditation outside	∘Imagination: parent–child conflict + perspective, rupture and repair	∘Own 40-min practice ∘Rupture and repair practice ∘Breathing space when you… ∘Mindfulness day
7. Love and limits	∘Compassion and loving- kindness ∘Befriending yourself and your (inner) child ∘Awareness of limits ∘Mindful limit setting	∘Loving- kindness ∘Self- compassion	∘Imagination: limits ∘Role-play: limits ∘What do I need?	∘Own 40-min practice ∘Bring in symbolic object ∘Write narrative ∘Mindful limit setting ∘Loving-kindness
8. A mindful path through parenting	∘Review of personal growth via symbolic objects or narrative ∘Looking to the future ∘Intentions for practice ∘How can I care for myself (and my child)?	∘Body scan ∘Loving- kindness	∘Sharing process through symbolic objects or narrative ∘Gratitude practice	∘Own practice
9. Follow-up session: each time, beginning a new	∘Experiences, obstacles and renewed intentions for practicing mindful parenting	∘Body scan ∘Stone meditation	∘Mountain meditation ∘Wishing well	∘Own practice

MPP Mindful Parenting Program

Table 2 Sociodemographic Characteristics of Participants

Sociodemographic	MPT group ($n = 20$)	Sham control group ($n = 20$)	χ^2,t
Mother age, Mean (SD)	35.96 (±5.23)	35.75 (±4.94)	0.38 NS
Child age, Mean (SD)	6.21 (±1.69)	6.97 (±1.54)	0.87 NS
Gender, female, *n* (%)	11(55%)	10 (50%)	0.01 NS
Mothers' educational level			
Diploma, *n* (%)	6 (30%)	4 (20%)	0.00 NS
Bachelor's degree, *n* (%)	8 (40%)	11 (55%)	0.05 NS
Master's degree, *n* (%)	6 (30%)	5 (25%)	0.02 NS

MPT Mindful Parenting Training group, *NS* not significant

improved significantly throughout the MPT sessions. In addition, some improvements occurred in the positive aspect of Parent–Child interactions and mothers' cognitive emotion regulation strategies. Further, mothers evaluated this program as valuable and productive in many aspects of their own and their family's functioning and reported major changes. These positive alterations were generally maintained until four weeks of post-training.

Regarding the sociodemographic discrepancies, considerable differences have not been found among participants. However, some studies indicated that parents' lower level of education is related to less profit from parenting intervention programs than parents with higher education (Potharst et al., 2018). Besides, the socioeconomic status (SES) of the disadvantaged family is often assumed to reduce the effectiveness of the parent training programs, and more sustainable adjustments are required to maintain the treatment effect (Leijten et al., 2013).

One of the main focuses of the present study was the Parent–Child relationship since extensive evidence indicated that these interactions can affect child wellbeing (Pinquart, 2017). The results represented a considerable improvement in the overall scores of the positive aspect of mother-child interaction in the intervention group (large effect sizes). These findings are consistent with a previous study which argued that each of the educational components of the MPT program, including non-judgmental attention with awareness of your own emotions and that of your child, as well as unconditional acceptance of the child, reduces conflict in mothers-child interactions (Van der Oord et al., 2012).

We hypothesized that the symptoms of parenting stress would significantly be reduced in the MPT group compared with the sham control group. According to the data obtained from the PSI scores, there is a significant decrease in the overall parenting stress scores in the MPT group compared to the sham control group throughout the intervention (from

Table 3 Means and standard deviations of PSI, PCRS, CERQ in MPT and Sham control conditions and repeated measure analysis for study variables

Measures	MPT group			Sham control group			Time x condition		
	Baseline *M (SD)*	Post-test *M (SD)*	follow-up *M (SD)*	Baseline *M (SD)*	Post-test *M (SD)*	follow-up *M (SD)*	*F*	η^2	Observed power
PSI	294.1 (−17.57)	226.7 (−9.2)	227.05 (−11.34)	283.55 (−26.28)	283.55 (−12.66)	282.3 (−11.82)	63.83***	0.64	0.96
PCRS	105.8 (−8.79)	120.55 (−8.57)	119.4 (−7.5)	109 (−10.14)	104.8 (−8.29)	105 (−6.88)	36.3***	0.53	0.99
CERQ-Adaptive St.	53.55 (−9.73)	76.6 (−6.8)	70.3 (−6.62)	53.3 (−10.55)	55.7 (−10.03)	53.58 (−7.96)	52.14***	0.63	0.96
CERQ-Maladaptive St.	45.6 (−6.86)	35.25 (−3.79)	36.6 (−4.01)	43.7 (−7.84)	43.45 (−6.97)	44.35 (−6.82)	50.94***	0.63	0.96

η^2 Partial eta-squared, *MPT* Mindful Parenting Training, *PSI* Parenting stress Inventory, *PCRS* Parent–Child relationship scale, *CERQ-Adaptive St.* Total Adaptive Cognitive Emotion Regulation Strategies Scores, *Total Maladaptive St.* Total Maladaptive Cognitive Emotion Regulation Strategies Scores

***$p < 0.001$. $\eta 2 = 0.01$ is small, $\eta 2 = 0.06$ is medium, and $\eta 2 = 0.14$ is large

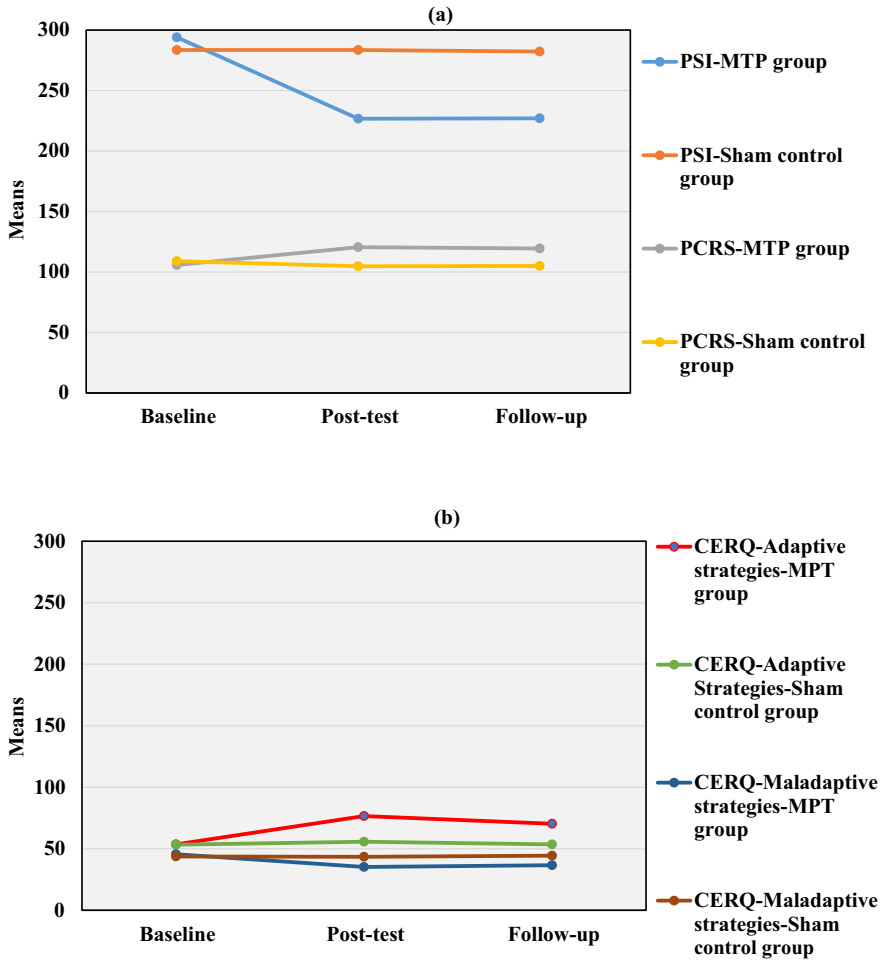

Fig. 2 The scores of PSI, PCRS and CERQ from pre-test to follow-up. (**a**) PSI, Parenting Stress Index and PCRS, Parent–Child Relationship Scale; (**b**) CERQ, Cognitive-Emotion Regulation Questionnaire -Adaptive strategies and CERQ, Cognitive-Emotion Regulation Questionnaire

pretest to follow-up). Similarly, earlier research showed that mindfulness techniques reduce stress by helping parents release their thoughts and repetitive behavior patterns in their interactions with children, especially under stressful conditions (Song & Lindquist, 2015). Therefore, the results of the present study are encouraging regarding the potential of mindfulness to provide practical principles for reducing parenting stress (Bögels et al., 2010; Bögels & Restifo, 2014; Britton et al., 2012; Chaplin et al., 2018; Coatsworth et al., 2010; Conner & White, 2014; Duncan & Shaddix, 2015; Neece, 2014; Neece et al., 2019; Van der Oord et al., 2012). Furthermore, mindful parenting helps parents become more aware of their parenting styles and will remind them that they are not doomed to repeat these patterns; it will also explore the parent–child attachment style (Bögels et al., 2010).

Notable improvements were observed in adaptive cognitive emotion regulation strategies among mothers of the intervention group at the end of the training program, and these gains were maintained at a two-month follow-up. According to the theoretical model of the present study, adaptive strategies including emotional awareness, acceptance, and monitoring of thoughts and emotions are the positive changes that have been enhanced as a result of the mindful parenting intervention. This was an important finding since awareness and acceptance of emotions can create an opportunity to improve interpersonal and mother-child interactions and prevent weak and incompatible emotional responses caused by automatic reactions in parents. Similarly, the present results confirm previous findings on the effectiveness of mindfulness-based interventions in emotional control and parental emotion regulation (Havighurst et al., 2013; Townshend et al., 2016; Turpyn & Chaplin, 2016). On the other hand, it has been claimed that mindfulness-based techniques may enhance the development of parenting skills by eliminating maladaptive strategies (particularly rumination) and modifying cognitive emotion regulation strategies (especially positive reappraisal, acceptance, and putting into perspective) (Flook et al., 2010; Garland et al., 2011; Malinowski, 2013).

It is remarkable that we did not have any dropouts during the MPT program. This may reflect our strong group cohesiveness throughout the sessions and indicate that mothers were highly motivated and found the course valuable for their problems. However, it should not be

overlooked that the large effect sizes achieved by the intervention group might result from a bias among mothers about the effectiveness of the mindful parenting training, so the results should be interpreted with caution. Nevertheless, according to a meta-analysis, effect sizes generally improved further from pre to follow-up. These findings show that parents often experience meaningful changes from attending mindful parenting interventions (Donovan et al., 2022). Also, it is argued that mindful parenting interventions are associated with higher parenting mindfulness scores for parents of typically developing children, but there is no intervention effect on overall parenting stress (Shorey & Ng, 2021).

Mindful parenting is a promising alternative for the parent's mental health, and it is found to be a feasible and acceptable intervention in mental health care. Improvements in Parent–Child interactions, parenting stress, and adaptive cognitive emotion strategies were observed, suggesting that practicing mindful parenting influences a diverse range of family factors. Besides, for clinical purposes, it is vital to learn whether mindful parenting can be done either alone or in combination with other treatments for parents.

Limitations and Future Research

Several methodological issues and restrictions should be considered in this study. First, we have only examined mothers; the findings cannot be generalized to a broader population due to the absence of fathers.

In addition, data has collected through self-report questionnaires. Therefore, definitive conclusions about the actual changes in mother-child interactions are not discernible. One concern with assessment by questionnaires is that although they can provide valuable and extensive information in a short period, they are pretty susceptible to social desirability bias. As a consequence, these results should be interpreted with caution. Another serious limitation of this study was that none of the contributors were blinded about the intervention stages, which could lead to information bias in estimating the therapeutic effects of MPT sessions. In future research, a comparison between mindful parenting and another recognized parenting approach in non-clinical settings should be addressed to identify the additional value of mindful parenting training as a preventative intervention.

Furthermore, future studies could remark that mindful parenting in a non-clinical situation imposes preventative effects in decreasing the number of children developing mental health disorders and requiring treatment in a clinical case. Another possible area of further research would be objective measurements of both parent and Parent–Child interactions. The present observation tools could be utilized in this regard to develop a novel observation tool for determining mindful parenting. In addition, due to the systematic environment of a family, it is suggested that the impact of mindful parenting on other family relationships, including parent-sister relationships, should be investigated in future studies. Finally, further experimental investigations are needed to approximate the sustainable effects of mindful parenting interventions in alignment with other treatment options, using follow-up courses for several months or even a year.

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Compliance with Ethical Standards

Conflict of Interest The authors declare no competing interests.

Ethical Approval 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 research protocol was approved by the Ferdowsi University of Mashhad Research Ethics Committee (IR.UM.REC.1398.016).

Informed Consent Participation in this research was voluntary, and informed consent was obtained from all families.

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