

# Effectiveness of Mindfulness-Based Parenting Programs in Reducing Parenting Stress in Parents of Children and Adolescents with Attention-Deficit/Hyperactivity Disorder: Systematic Review and Meta-Analysis

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## ABSTRACT

**Objective:** To systematically evaluate the effectiveness of mindfulness-based parenting programs in reducing parenting stress in parents of children and adolescents with ADHD.

**Materials and Methods:** Studies published in English or Thai before February 2020 were identified through the PubMed, Embase, and Thai-Journal Citation Index databases. Studies were included if they used mindfulness-based parenting interventions for parents of children and adolescents with ADHD, and parenting stress was measured. The risk of bias was evaluated with the Cochrane risk-of-bias assessment tool for randomized trials, and with the ROBINS-I tool for non-randomized studies.

**Results:** Six studies were included. The 2 randomized controlled trials reported significant reductions in parenting stress in the intervention groups compared with the control groups at post-test, and this effect was maintained at the 8-week follow-up of one of the studies. However, the 4 pre-experimental studies reported conflicting results. Two reported significant reductions in parenting stress from pre- to post-intervention, with one of those studies reporting a further reduction in parental stress at the 6-week follow-up. In contrast, another study reported a significant reduction in parental stress from pre- to post-intervention for fathers but not mothers; this effect was maintained at the 8-week follow-up. The fourth study reported no significant changes in parental stress from pre- to post-intervention. A meta-analysis of 3 studies demonstrated no significant changes in parenting stress from pre- to post-intervention.

**Conclusion:** The effectiveness of mindfulness-based parenting programs in reducing parenting stress in parents of children and adolescents with ADHD is still inconclusive, although promising. Further studies are needed.

**Keywords:** Attention-deficit/hyperactivity disorder; mindfulness-based parenting program; parenting stress (Siriraj Med J 2022; 74: 371-380)

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## INTRODUCTION

Attention-deficit/hyperactivity disorder (ADHD) is a common neuropsychiatric condition in children and adolescents, with a prevalence of 5% to 12% worldwide.<sup>1</sup> ADHD is often comorbid with many psychiatric disorders, including oppositional defiant disorder<sup>2</sup>; conduct disorder<sup>3</sup>; mood disorders<sup>4,5</sup>; anxiety disorders<sup>6-8</sup>; learning disorders<sup>9</sup>; Tourette's disorder<sup>10</sup>; and substance use disorder.<sup>11</sup> ADHD negatively affects not only the patients but also their families. High levels of distress in the families-particularly in mothers<sup>12</sup>-of children with ADHD have been reported, and this can lead to difficulties in the caring for, and parenting of, the children. Effective parent management is a key component of behavioral management for children with ADHD. Previous studies found that parents under stress failed to demonstrate parenting skills despite their participation in a parent-training program, and they were likely to feel frustrated.<sup>13</sup> This may be due to the parents lacking awareness of their own emotions when they are under stress.

Mindfulness is the awareness that arises through purposely and nonjudgmentally focusing on the present moment. There is strong evidence that mindfulness-based therapy is an effective treatment for a variety of psychological problems, and it is especially effective for reducing anxiety, depression, and stress.<sup>14</sup> Mindful parenting is one of the modern approaches to child rearing which reduces parents' reactivity to children's behaviors.<sup>15</sup> It also affects family functions through reducing parenting stress and focusing on the psychological pathology of parent-child.<sup>16,17</sup> It exerts its effect via the following 5 processes: attentive listening, nonjudgmental acceptance of oneself and one's children, awareness of emotions and self-regulation in childrearing relationships, and compassion toward oneself and one's children.<sup>18</sup> However, the results of studies on the effectiveness of mindfulness-based approaches to reducing parenting stress have been controversial.

The present review therefore aimed to systematically evaluate the effectiveness of mindfulness-based parenting programs in reducing parenting stress in the parents of children and adolescents with ADHD.

## MATERIALS AND METHODS

### Search strategy

A literature search was conducted via the PubMed, Embase, and Thai-Journal Citation Index databases from inception to February 9, 2020. The keywords used for the search were (mindfulness OR meditation) AND (parent OR parenting) for PubMed; and (mindfulness OR mindfulness-based stress reduction OR mindfulness-based

therapy OR meditation) AND (parent OR parenting) for Embase. As to the Thai-Journal Citation Index database, the keywords were (mindful AND parent AND ADHD). In addition, the reference lists of eligible articles were scanned, and a Google search was used for relevant articles. The process of article selection is illustrated in Fig 1.

### Eligibility criteria and study selection

To be eligible for inclusion in the meta-analysis, a study needed to meet all of the following criteria.

The study investigated the efficacies of mindfulness-based, parent-training interventions for the parents of children and adolescents with ADHD. The interventions included mindfulness-based stress reduction, mindfulness training for parents, and mindfulness-based cognitive therapy. The interventions had to be delivered by qualified leaders for at least 1 hour per week over a minimum of six weeks.

The study participants were the parents of children up to 18 years of age with ADHD. The ADHD diagnoses were based on either the Diagnostic and Statistical Manual of Mental Disorders criteria for Attention Deficit Hyperactivity Disorder, or the Strengths and Weakness of Attention Deficit Hyperactivity Disorder Symptoms and Normal Behavior Scale (SWAN).<sup>19-22</sup>

The study was designed as a randomized controlled trial, a case-control study, or an uncontrolled trial.

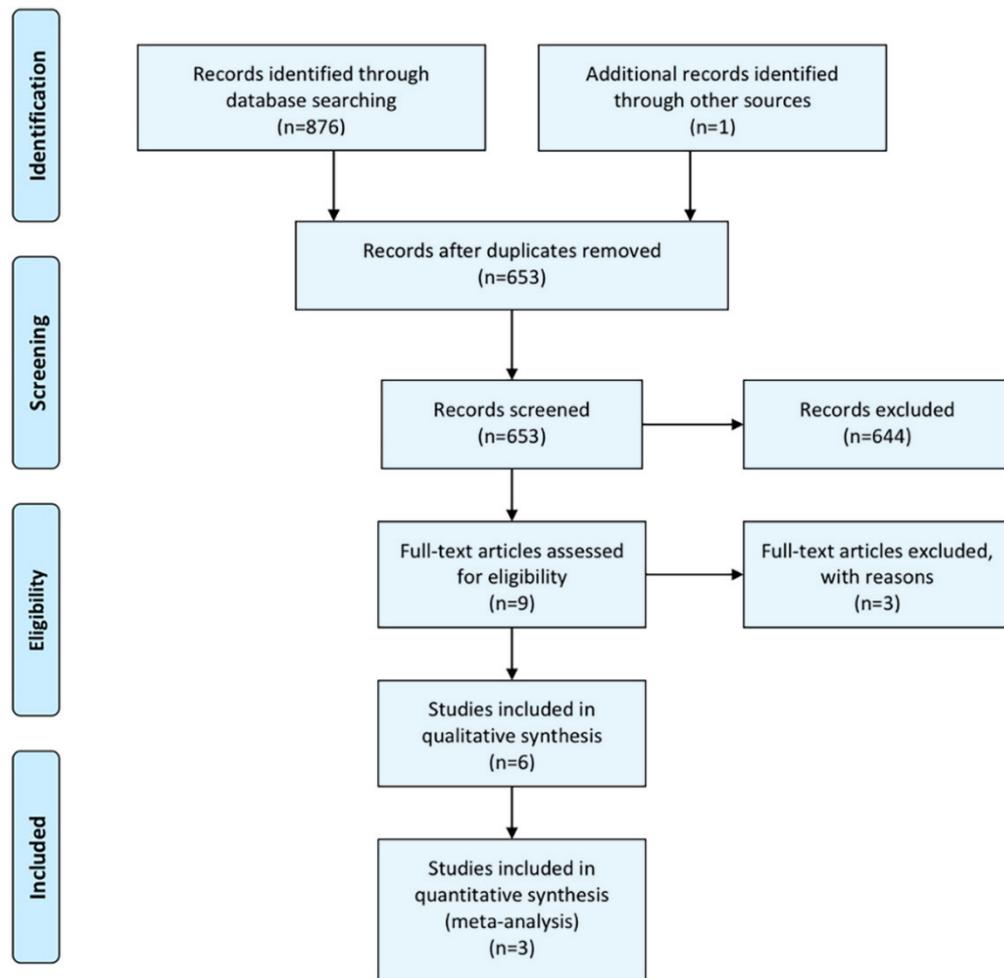
Parenting stress was measured and compared using at least one of the following instruments: the Parenting Stress Index-Short Form (PSI-SF)<sup>23</sup>; PSI-25<sup>24</sup>; and the Stress Index for Parents of Adolescents (SIPA).<sup>25</sup> The assessments were made at pre-intervention, post-intervention, and follow-up, with or without a control group.

The study had been published in English or Thai.

### Data extraction and quality assessment

One of the authors identified the included studies, and 2 authors independently extracted data from each paper. The data were the participants' characteristics, youth age and gender, study design, intervention characteristics, the instrument used to measure parenting stress, and the points-of-time of parenting-stress assessments (Table 1).

The qualities of the included studies were independently assessed by 2 authors. For the randomized controlled studies, the Cochrane Collaboration's tool for assessing risk of bias in randomized trials was used.<sup>26</sup> In the case of non-randomized controlled studies, the authors utilized ROBINS-I.<sup>27</sup> Disagreements about the qualities of the studies were resolved by consultation with the third author.



**Fig 1.** PRISMA (2009) flow diagram.

### Statistical analysis

Cohen's *d* effect size was used to estimate the effect of the mindfulness-based, parent-training intervention between the pre- and post-intervention time-points for each study. Three studies were subsequently included in a meta-analysis, using Cohen's *d* effect size to estimate the overall effect of the mindfulness-based, parent-training intervention between pre- and post-intervention.

## RESULTS

### Study selection

As shown in [Fig 1](#), the database search identified 876 articles. One study was added from another resource. After duplicates were removed, 653 remained. Through the title and abstract screening process, 644 studies were considered non-eligible for inclusion in the systematic review. The full text of 9 studies was examined. Three studies did not meet the selection criteria for at least one of the following reasons: (a) the outcome measures reported stressful life events rather than parenting stress; (b) the intervention was not a parenting program but psychoeducation; or (c) the outcome measurement was

in the form of a descriptive report. The 6 studies that met the selection criteria were included in the systematic review.

### Study characteristics

[Table 1](#) details the main characteristics of the 6 included studies. Four studies used a single-group design (pre-post intervention), whereas the remaining two were randomized controlled trials. The majority of the participants in each study were mothers and male children. Four studies reported no changes in medication during the study period. As to the other two, all the children in both groups received either risperidone or Ritalin in one study, while the other did not mention any medications.

In addition, two studies reported comorbid disorders in the children: learning disability, depressive disorder, anxiety disorder, speech disorder, developmental delay, genetic disorder, and Tourette's syndrome. The interventions for the parents were mindfulness-based cognitive therapy and mindfulness-based stress reduction. Five studies had an intervention for children and adolescents. All studies were published in English.

**TABLE 1.** Details of included studies.

Author	Country	Study design	Sample size (parent's gender)	Youth age years (mean) (child's gender)	Intervention characteristics			Instrument used to measure parental stress	Points-of- time for assessment
					Intervention program	Intervention groups	Sessions		
Herman H.M.Lo et. al. <sup>28</sup>	Hong Kong	2-armed RCT: 1.MP 2.wait list control	n = 100  (96% mothers)	5–7 (6.25)  (83% boys)	1.MP adapted from Bögels and Restifo., 2014 and Coatsworth et al., 2010 2.control: nil (offered MP after waitlist)	MP: Parent group and separate child mindfulness group Control: Nil	MP: 6 weeks x 1.5 h; total 9 h (for parent group) 8 weeks x 1 h (for child group)	PSI-SF (36 items)	T1 – baseline T2 – after intervention
Dexing Zhang et.al. <sup>29</sup>	Hong Kong	Uncontrolled trial: 1.MP	n = 10  (64% mothers)	8–12 (9.5)  (73% boys)	MP adapted from mindfulness-based intervention (MYmind) of van de Weijer- Bergsma et al., 2012 and van de Oord et al., 2012	Parent group and separate child mindfulness group	MP: 8 weeks x 1.5 h; total 12 h (for both parent and child groups)	PSI-SF (36 items)	T1 – baseline T2 – after intervention
Mahdiyeh Behbahani et.al. <sup>30</sup>	Iran	2-armed RCT: 1.MP 2.wait list control	n = 56  (100% mothers)	7–12  (66% boys)	1.MP (Bögels and Restifo, 2014) 2.control: nil	MP: Parent group Control: Parent group	MP: 8 weeks x 1.5 h; total 12 h for parent group	PSI-SF (36 items)	T1 – baseline T2 – after intervention T3 – 8 weeks follow up
Van de Oord et.al. <sup>31</sup>	The Nether- lands	Uncontrolled trial: 1.MP	n = 22  (95% mothers)	8–12 (9.55)  (73% boys)	MP adapted for parents of children with ADHD from Bögels et al., 2008 and Bögels et al., 2010	Parent group and separate child mindfulness group	MP: 8 weeks x 1.5 h; total 12 h (for both parent and child groups)	PSI-SF (25 items)	T1 – waitlist T2 – pretest T3 – posttest T4 – 8 weeks follow up

**TABLE 1.** Details of included studies. (Continue)

Author	Country	Study design	Sample size (parent's gender)	Youth age years (mean) (child's gender)	Intervention characteristics			Instrument used to measure parental stress	Points-of- time for assessment
					Intervention program	Intervention groups	Sessions		
Haydicky et.al. <sup>32</sup>	Canada	Uncontrolled trial: 1.MP	n = 17  (94% mothers)	13–18 (15.5)  (72% boys)	MP adapted from Bögels et al., 2008	Parent group and separate child mindfulness group	MP: 8 weeks x 1.5 h ; total 12 h (for both parent and child groups)	SIPA	T1 – waitlist (4 weeks pre- intervention) T2 – pretest T3 – posttest T4 – 6 weeks follow up
Van de Weijer- Bergsma et.al. <sup>33</sup>	The Nether- lands	Uncontrolled trial: 1.MP	n = 11  (55% mothers)	11–15 (13.4)  (50% boys)	MP (Bögels et al., 2008 and Bögels et al., 2010)	Parent group and separate child mindfulness group	MP: 8 weeks x 1.5 h; total 12 h (for both parent and child groups) + 1xjointparent and adolescent booster at 8 weeks post-completion	PSI-SF (25 items)	T1 – baseline T2 – after intervention T3 – 8 weeks follow up T4 – 16 weeks follow up

**Abbreviations:** MP; mindfulness-based parenting program, PSI-SF; Parenting Stress Index–Short Form, SIPA; Stress Index for Parents of Adolescents

### Synthesis of the results

The results of the 6 studies (summarized in Table 2) indicated that the mindfulness-based parenting programs tended to reduce parenting stress. The 2 randomized controlled trials reported significant reductions in parenting stress, with nearly a small effect size ( $d = 0.19$ ;  $p = 0.009$ ) in the intervention group compared with the control group at post-test. This effect was maintained until the 8-week follow-up of one of those 2 studies. The 4 pre-experimental studies reported conflicting results. Van de Oord et al. and Haydicky et al. reported significant reductions in parenting stress from baseline to the 8-week follow up with a medium effect size ( $d = 0.57$ ), and from post-intervention to the 6-week follow up with a large effect size ( $d = 0.81$ ), respectively. By contrast, Van de Weijer-Bergsma and colleagues reported a significant reduction in parenting stress from pre- to post-intervention for the fathers, but not for the mothers; this effect was maintained at the 8-week follow-up. On the other hand, Dexing Zhang et al. reported no significant changes in parenting stress between the pre- and post-intervention time-points.

Three studies with the same outcome measures were included in the meta-analysis. In all, there were 166 participants. The meta-analysis did not reveal any significant changes in parental stress between pre- and post-intervention (Fig 2).

### Risk of bias in individual studies

Fig 3 illustrates the risk-of-bias assessments of the 2 randomized controlled studies. Both studies were judged to have a high risk of bias for blinding of outcome assessment. Table 3 shows the risk of bias assessment for the 4 non-randomized studies using the ROBINS-I quality assessment tool; their overall risk of bias was moderate.

## DISCUSSION

The main results of this study were that the 2 randomized controlled trials reported significant reductions in parenting stress in the intervention groups compared with the

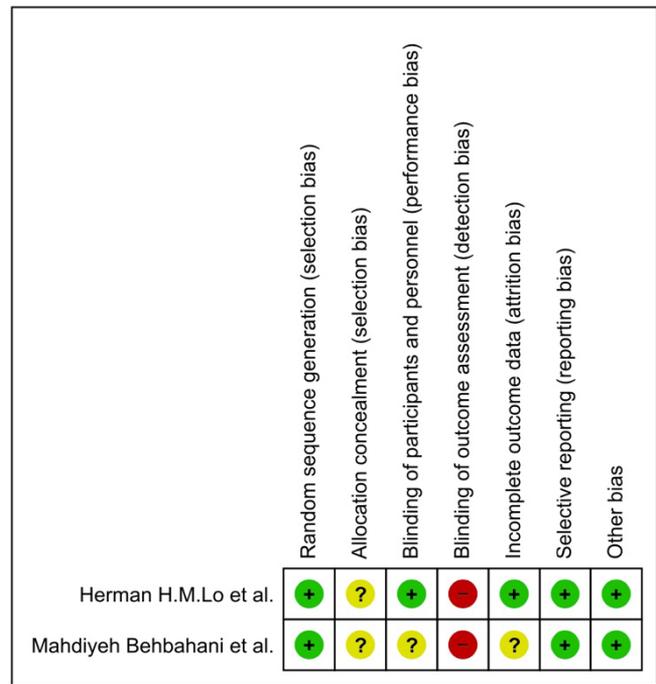


Fig 3. Risk-of-bias assessment for the included randomized controlled studies.

control group at post-test, while the 4 pre-experimental studies reported conflicting results. A meta-analysis of 3 studies demonstrated no significant changes in parental stress from pre- to post-intervention.

To our knowledge, this is the first systematic review on this topic, which means that there are no previous studies to compare with. However, there are some factors that may influence the differences in the main outcome-parenting stress-of each study. Only 2 studies mentioned comorbid disorders (speech disorders, developmental delay, genetic disease, Tourette’s syndrome, learning disability, depressive disorder, and anxiety disorder), and only one study mentioned the severity of ADHD. It is reasonable to assume that both comorbidity and severity can affect the effectiveness of mindfulness-based parenting programs aimed at relieving parenting stress. For example, parents of children with more comorbid disorders or the more severe symptoms of ADHD are likely to experience more stress and more challenges in

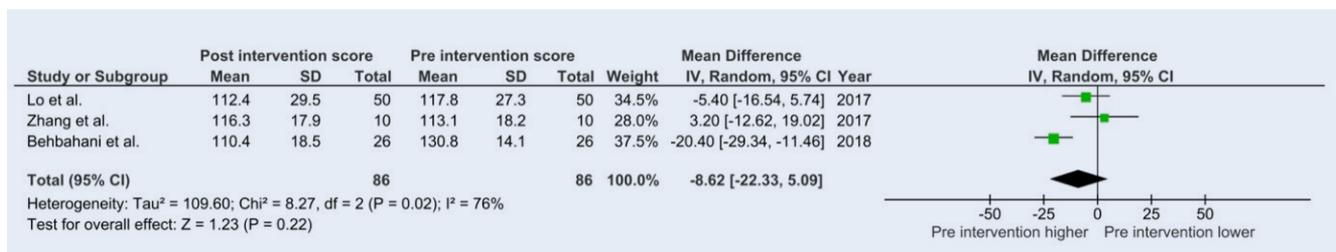


Fig 2. Meta-analysis of 3 studies

**TABLE 2.** Results of mindfulness-based parenting programs for parenting stress.

Study	Instrument used to measure parental stress	Intervention group			Control group			P-value			Cohen's d			
		Pre-test (T1) Mean (S.D.)	Post-test (T2) Mean (S.D.)	Follow-up (T3) Mean (S.D.)	Pre-test (T1) Mean (S.D.)	Post-test (T2) Mean (S.D.)	Follow-up (T3) Mean (S.D.)	T1-T2	T2-T3	T1-T3	T1-T2	T2-T3	T1-T3	
Herman H.M.Lo et al., 2017	PSI-SF (36 items)	117.82 (27.29)	112.36 (29.51)	–	110.02 (24.95)	111.28 (25.17)	–	0.009	–	–	0.19	–	–	
Dexing Zhang et al., 2017	PSI-SF (36 items)	113.1 (18.2)	116.3 (17.9)	–	–	–	–	0.01	–	–	-0.18	–	–	
Behbahani et.al., 2018	PSI-SF (36 items)	130.8 (14.1)	110.4 (18.5)	109.4 (18.9)	132.4 (11.6)	128.0 (17.6)	130.3 (18.0)							
van de Oord et al., 2012	PSI-SF (25 items)	70.68	65.41 (-1.73)	58.18 (-3.64)	–	–	–	>0.05	–	<0.01 (8 weeks)	–	–	0.57 (8 weeks)	
Haydicky et al., 2015	SIPA	58.82 (9.50)	55.78 (8.50)	51.36 (6.40)	–	–	–	–	0.010 (6 weeks)	–	–	0.81 (6 weeks)	–	
van de Weijer-Bergsma et al., 2012	PSI-SF (25 items)	Mother	64.1 (17.4)	73.1 (20.6)	67.4 (19.4)	–	–	–	>0.05	–	>0.05 (8 week)	0.5	–	0.2 (8 weeks)
		Father	73.8 (27.8)	54.1 (28.7)	46.1 (24.0)	–	–	–	<0.01	–	<0.01 (8 weeks)	0.7	–	1.1 (8 weeks)

**Abbreviations:** PSI-SF; Parenting Stress Index–Short Form, SIPA; Stress Index for Parents of Adolescents

**TABLE 3.** Risk-of-bias assessments of included non-randomized studies, using ROBIN-I quality assessment tool.

Studies	Confounding	Selection of participants	Classification of interventions	Deviation from intended intervention	Missing data	Measurement of outcomes	Selection of reported results	Overall quality
Dexing Zhang et al., 2017	–	–	–	–	/	/	–	Moderate
van de Oord et al., 2012	–	–	–	–	–	/	–	Moderate
Haydicky et al., 2015	–	–	–	–	–	/	–	Moderate
van de Weijer-Bergsma et al., 2012	–	–	–	–	–	/	–	Moderate

+ critical; x serious; / moderate; –low; ? no information

practicing mindfulness in parenting. Moreover, parents' continuous practicing of mindfulness and the parenting skills they learned from a program are other factors that can affect the outcomes. Nevertheless, no studies mentioned those factors. Moreover, with limited data on comorbidities, the severity of ADHD, and the parents' understanding and practicing of mindful parenting skills, these possible confounding factors could not be controlled. This could have affected the outcomes of each of the 6 studies and the meta-analysis, as well as the generalizability of the results of the meta-analysis.

There were several limitations of this review. Firstly, the studies recruited in this review were published in Thai or English from 3 databases, so some relevant studies might not have been included in this review. In addition, all of the studies had small sample sizes. Moreover, there was heterogeneity in the outcome measures, the interventions, and the designs of the studies. All of those factors could affect the accuracy and generalizability of the meta-analysis results.

The findings from this study may have an important implication for the treatment of children with ADHD. Our experience in conducting a parent training program with parents of young patients with ADHD found that parenting stress hindered the effectiveness of their parenting skills they have gained. Therefore, a mindfulness-based

parenting program, which may be able to reduce parenting stress, could be an effective parent training program for parents of children with ADHD, leading to a better treatment outcome in this patient population.

To conclude, the effectiveness of mindfulness-based parenting programs in reducing the parenting stress in parents of children and adolescents with ADHD is still inconclusive, although promising. More studies on this topic are needed.

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**Ethics approval:** Ethics approval was obtained from the Siriraj Institutional Review Board. The study was conducted in accordance with the principles for medical research involving human subjects as defined by the Declaration of Helsinki, the Belmont Report, CIOMS guidelines, and the International Conference on Harmonization in Good Clinical Practice (ICH-GCP).

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