

# Mindfulness Training for Adults and Children with ADHD: Variables and Outcomes

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## Abstract

*Purpose of review* Mindfulness-based interventions are an emerging and potentially effective training for children and adults with attention deficit hyperactivity disorder (ADHD). However, several aspects must be considered. The objective of this article is to collect and compare the most revealing mindfulness-based interventions (MBIs) for ADHD in adults and children and analyse the presence of variables that could be influencing the effectiveness of such intervention.

*Recent findings* The lack of controlled studies using MBI for ADHD, especially in research with groups of children or the lack of information of specific techniques as well as future research and trends, will be discussed.

*Summary* MBIs for treating ADHD are a novel and promising interventions that can be complementary to traditional programs.

**Keywords** ADHD · Mindfulness · Mindful parenting · Psychological treatment · Meditation

## Introduction

Attention deficit hyperactivity disorder (ADHD) is one of the most common neurodevelopmental disorders in childhood

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This article is part of the Topical Collection on *ADHD*

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and often persists in adolescence and adulthood with a prevalence of 5% of school-age children [1]. Currently, the two main/most common recommended interventions for adults and children with ADHD are pharmacological and psychosocial treatments. Nowadays, pharmacological treatment is the most common intervention for severe ADHD and is primarily based on psychostimulants. However, it has many limitations that show that we must be cautious in its use: not all patients present a reduction of their symptoms or stop experiencing difficulties, their long-term efficacy is unclear, sometimes it has significant side effects and the adherence to the treatment is generally low [2].

The international guidelines [3, 4] recommend the use of pharmacological treatments, but as a part of a more comprehensive intervention programme that includes a combined psychosocial intervention, like behaviour modification techniques, parental training, self-regulation techniques, social skill training or adaptations of the teaching-learning process.

Parent training in behaviour management is the most effective psychosocial intervention [5] especially when children are young. However, the long-term effects of these programmes are limited because they depend on the constancy that parents can maintain to respond in the same way to the same type of behaviour [6]. In this sense, it is important to consider the hereditary factor of ADHD, as a predictor of the lack response to this parental training [7]. For this reason, it is interesting to stimulate and encourage the search for new alternatives or intervention components.

Mindfulness-based interventions (MBIs) have proven to be a promising psychological treatment [8] in adults and in children [9]. However, the majority of studies on mindfulness with youth engage generally healthy participants recruited from schools, and the application of this method to the children in clinical settings like ADHD is still incipient and

difficult to support, given the lack of studies with control randomized groups and strong samples.

The objective of this article is to collect and compare the most revealing MBIs for ADHD in adults and children and analyse the presence of variables that could be influencing the effectiveness of such intervention.

### Mindfulness and ADHD

Mindfulness has been described as a state of consciousness in which there is an enhanced attention to moment-to-moment experience [10]. In clinical practice, the use of mindfulness is directed to enhance the “awareness” of mental, emotional and physical patterns or registers that arise in people’s daily lives, learning to accept these thoughts and emotions without intervening in them, trying to experience the process in a healthy way [11, 12].

Different MBIs have been designed showing significant results on multiple disorders [13]. It was first promoted for clinical use by Kabat-Zinn [14] as a stress reduction technique and management of chronic pain, giving rise to the mindfulness-based stress reduction (MBSR) intervention programme, which focuses the encouragement of awareness in mind and body, without trying to fix, change or analyse the experience that is being lived [15]. Another evidence MBI programme is the mindfulness-based cognitive therapy (MBCT) [16] that consists of combining meditation exercises with the practice of cognitive therapy. It has shown to be effective in the reduction of symptoms in several disorders [17].

Mindfulness practice have shown to be effective in increasing attention regulation and performance in executive functioning tasks, the improvement of cognitive processes [18] and the reduction of impulsivity [19], as well as the regulation of emotions [20] which has a favourable effect on conflict resolution [21]. In addition, it seems to influence on the activity of front-striatal circuits, which has been associated with ADHD [22]. MBIs, in turn, reduce stress in caregivers and improve listening and attention skills [23], which in the case of ADHD can help to stop the cycle of disruptive behaviours that children and adolescents have. It has been shown that many of the frontal regions affected in individuals with ADHD can be activated and improved through meditation [24], thus, revealing this practice as a successful intervention in improving the symptomatology of ADHD [25].

### Efficacy of an MBI’s in Adult ADHD

The use of MBIs for the treatment of ADHD in adults and children has proliferated over the last 15 years [26]. Regarding attention, Zylowska and colleagues [27] studied the efficacy of a modified version of the MBCT, reporting the results of a feasibility pilot study of mindfulness training for adults and adolescents with ADHD (24 adults and 8 adolescents). The mindfulness training was adapted to meet the unique challenges

of ADHD symptoms and included a psychoeducational component about ADHD. The 8-week programme consisted of once-per-week evening sessions lasting 2.5 h and daily at-home practice. They used measures of cognitive functioning, and self-report scales of ADHD, depression, and anxiety symptoms and several cognitive tests. Results reported changes in behavioural and an improved response to attentional tasks, although they should be considered exploratory given the absence of a control group. However, Mitchell and colleagues [28] did not confirm this data in a randomized clinical trial (RCT).

Regarding ADHD symptoms, Schoenberg and colleagues [29] conducted an RCT (in a sample of 50 participants), with a 3-h weekly session, during 12 weeks, and a daily work of 30 to 45 min, that shows a reduction of the attentional and hyperactive/impulsive symptomatology. Edel, Hölter, Wassink and Juckel [30], who carry out a MBI with a duration of 13 weeks, using 2 h in each weekly session, and a non-randomized control group, showed a reduction of ADHD symptoms. They compared the effectiveness of MBCT ( $n = 39$ ) in comparison with a dialectical-behaviour therapy [31] ( $n = 52$ ) mindfulness skill’s training, assigned to one of the two conditions in a non-randomized manner. The measure employed for ADHD symptoms was Wender Reimherr Interview (WRI) [32]. Mindful Attention Awareness Scale (MAAS) [10] was used to check different levels of mindfulness, and the Generalized Self-Efficacy Scale (GSES) [33] was used to measure the self-efficacy as an important basis for motivation, change commitment and actual change. The conclusion showed that there were no significant differences between groups. Hepark and colleagues [34] conducted a RCT with an adapted MBCT programme, in a sample of 99 participants. The duration of the MBCT programme was also 12 weeks and 3 h per weekly session. Results showed an improvement in ADHD symptoms and executive functioning. Regarding emotional symptoms, several studies have shown its efficacy in the reduction of anxiety and depression [27, 34, 35] and quality of life [35].

### Efficacy of an MBI’s in Children with ADHD

The use in mindfulness in children requires a process adaptation and the involvement of parents in the intervention, showing the need of a specific intervention specially designed for this aim. The MYmind training is the one that shows more scientific evidence. The MYmind training [36] is an MBI programme for parents and children with ADHD, based on the empirical validation of MBCT mindfulness programme created by Segal [16]. The programme is designed to be used by young people between 9 and 18 years of age, recommending forming groups of between four or five students, attending to the next age groups. The MYmind intervention programme targets both children with ADHD and their parents and has two main objectives: The first one, improve attention and concentration, and decrease impulsivity,

hyperactivity and disruptive behaviours of young people with ADHD between 9 and 18 years. The last one, help families integrate mindfulness into their daily lives as a way to manage the symptoms of ADHD, stress, family relationships and difficult emotions [36]. The programme consists of eight 1.5-h group sessions for between four and six children (aged 9–12), or between six and eight adolescents (aged 13–17) with a diagnosis of ADHD, and parallel eight 1.5-h group sessions for their parents, plus a follow-up session 8 weeks after the end of the training [37].

During the training, parents receive a mindful parenting intervention, that is, which aims to improve parental skills of parents in their children's education. It consists of "paying attention to the child and to his education in a particular way: intentional, here and now, without judging" [38]. In this line, there are studies about parental training in mindfulness, whose results show improvement in positive interactions with their children and satisfaction in raising them [39].

Regarding ADHD symptoms, Van der Oord, Bögels and Peijnenburg [40] showed how MYMind programme generated a reduction in the ADHD symptoms reported by parents (33 children between 8 and 12 years old). A quasi-experimental control group and a pre- (one week before the start of treatment), post- (directly the *t* session of treatment) and follow-up (8 weeks later) design were used. With the same intervention, Van der Weijer-Bergsma and colleagues [22] (sample of 10 adolescents between 11 and 15 years old) revealed a reduction in the ADHD symptomatology reported by teachers and parents. Haydicky, Wiener and Shecter [41] found a significant improvement in attentional difficulties (sample of 18 adolescents), behavioural problems and relationship with parents. Regarding parents, Van der Oord, Bögels and Peijnenburg [40] and Haydicky and colleagues [41] showed a reduction in parenting stress and increases in mindful parenting.

Finally, it should be mentioned the mindfulness martial arts (MMA) programme [42]. The authors examined the effects on executive function, social skills and internalizing and externalizing behaviour of adolescents between 12 and 18 years old with learning disabilities. The study used a pre-post intervention waitlist control group design. The MMA group showed some improvements in conduct and social skills when compared to the WL group.

## Conclusion

There is not enough data to confirm that MBIs are an effective tool to be used in ADHD programmes, however results suggest that it is worth to increase research and develop strategies rooted on mindfulness interventions. However, several aspects should be considered.

Lancet's publication, one of the largest imaging studies of individuals with ADHD conducted to date, with a sample of more than 3000 participants, between 4 and 63 years, reported that the most significant alteration between healthy individuals and individuals with ADHD is in the amygdala, responsible for the processes of emotional regulation [43]. Furthermore, emotion regulation has been found to be one of the main mechanisms underlying the efficacy of MBIs [20], but surprisingly, there are few MBI's studies measuring this variable [6].

Regarding MBI's components in children treatment, they include several meditative practices that have different psychological targets [44]. According to Dhal, Lutz and Davidson [45], there are three families of mindfulness meditation: (a) attentional family: meditation practices that strengthen the self-regulation of various attentional processes; (b) constructive family: meditation practices that train affective patterns that foster well-being and (c) deconstructive family: meditation practices focused on self-inquiry to foster insight into the processes of perception, emotion and cognition. Furthermore, regarding practice, there is still a lack of information about which practices are better depending on age groups [46]. For example, compassion and self-compassion techniques have not been specifically studied in the ADHD treatment; however, they have been proved effective in many disorders [47, 48]. In addition, another interesting question is how different patterns of ADHD symptoms response to treatment, for example, it would be interesting to know the effects in an inattentive versus, a more hyperactivity or impulsivity children. Finally, it could be a very interesting work to the adaption of the programme when the children are under 8 years old (first age to receive a mindfulness training published so far), or their hyperactivity or impulsivity does not allow them to sustain the eight sessions of the training.

Regarding parents, the intervention is frequently a component in MBIs, but there are not data about the specific effect of this component. It would be interesting to analyse whether, regardless of the age or the ADHD presentation of the children, parental intervention causes significant positive changes in the development of the disorder and which variables can be improved. In addition, another interesting topic could be to study if the decrease of the parents' stress after an MBI affects in some way the attentional component or decrease the impulsiveness of the child. Perhaps, it can be only a factor mediating wellness of family harmony. Another components like the length of the programme, or the number of sessions, the effects of daily practice or the role of the setting should be also taken into account in future studies.

There are many areas and possibilities to improve the effectiveness of these programmes, especially in the case of mindfulness training for children with ADHD. MBI for the treatment of ADHD is promising, but further studies will be necessary to support the effectiveness of these mindfulness

programmes to obtain the recommendation of the international guidelines.

### Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no competing interests.

**Human and Animal Rights and Informed Consent** This article does not contain any studies with human or animal subjects performed by any of the authors.

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