

Strengthening Bonds Children with ADHD and Parents

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Introduction

Attention-deficit/hyperactivity disorder (ADHD) is a common neurodevelopmental disorder with a worldwide prevalence of about 5% in children. Its multi-factorial aetiology, diverse neurocognitive impairments and co-occurring problems make ADHD a complex and heterogeneous disorder. Self-control deficits in everyday life, such as problems with controlling impulses, switching attention, regulating emotional responses, initiating and organising tasks, impact functioning of children with ADHD. Ratings of child self-control are an important predictor for health, wealth, academic, occupational and crime outcomes years later. Therefore, improving self-control is an essential treatment target for ADHD.

Current best practices for child ADHD treatment comprise psychoeducation, pharmacotherapy and/or (cognitive-) behavioural treatments. Pharmacotherapy can reduce ADHD symptoms, improve quality of life and adaptive functioning, and increase executive function. However, pharmacotherapy is ineffective for 20%-35% of children with ADHD. Further disadvantages include low adherence, adverse effects and uncertainty about long-term effect. Meta-analytic evidence of non-pharmacological treatments shows small reductions in core ADHD symptoms which turn non-significant when using probably-blinded raters such as teachers.

Mindfulness-based intervention (MBI) may reach children that insufficiently respond to current best practices in ADHD treatment. MBIs directly target self-control and can elicit positive effects on psychological symptoms and behaviour of children and parents. Improving neurocognitive functions is considered to be one possible working mechanism of MBIs, supported by neuro-imaging studies.

Parenting Styles and Approaches

A meta-analysis on MBIs for ADHD found medium reductions in inattentiveness ($d=-0.66$) and hyperactivity/impulsivity ($d=-0.48$) in youth, but included studies without control-group or randomisation and small sample sizes. Another meta-analysis including only randomised controlled trials (RCTs) focussed on both mindfulness and yoga-based interventions and found a medium reduction in inattentiveness ($g=-0.52$) and a small reduction in hyperactivity/impulsivity ($g=-0.40$) in youth. Three subsequent RCTs studying MBIs in the treatment of youth with

ADHD found significant reductions in parent-rated ADHD symptoms, teacher-rated ADHD symptoms, and improvements in emotional self-regulation and a sustained attention task.

Mindful parenting training is a specific type of MBI in which parents intentionally bring mindful awareness to the parent-child relationship. Parents develop qualities such as listening with full attention to the child, self-regulation in the parenting relationship, compassion for self and child, and non-judgmental acceptance and emotional awareness of self and child. A review and meta-analysis showed that mindful parenting training can decrease psychological distress and parenting stress. However, RCTs on MBI as treatment for children with ADHD that included parental outcomes are scarce. Behbahani et al., compared the addition of a mindful parenting training with pharmacotherapy for children with pharmacotherapy-only and found significant reductions in parenting stress. Lo et al., compared a family MBI with waitlist-control for young children and their parents and found small positive effects on parenting stress and parental well-being, but no significant effect on parental ADHD symptoms and mindful parenting.

Emotional and Psychological Stress

MindChamp examines the effectiveness of a family MBI (called 'MYmind') as an add-on to care-as-usual (CAU) for ADHD. We addressed limitations of previous RCTs by conducting a pre-registered well-powered RCT, in which the actual treatment received in both groups was documented and probably-blinded raters (teachers) were included. Short- and long-term treatment effects in both youth (8-16 years) and parents were assessed. Further, because the effects of MBI can be heterogeneous, as shown in our qualitative study, we explored response to treatment on both individual and group levels. Our primary outcome was post-treatment parent-rated self-control deficits of the child. Secondary child outcomes include parent- and teacher-rated ADHD and other psychological symptoms, parent-rated well-being and self-rated mindfulness. Secondary parent outcomes include self-rated ADHD and other psychological symptoms, well-being, self-compassion and mindful parenting.

Group differences on DSM ADHD symptoms (CPRS) were not statistically significant in the ITT sample at all timepoints. SWAN results were similar to CPRS for inattentiveness, but for hyperactivity-impulsivity group differences were larger and significant in favour of MBI at post-treatment and 6-month

follow-up. According to the PP analyses, significant improvement was observed for inattentiveness at post-treatment (CPRS) and for hyperactivity impulsivity at post-treatment (CPRS and SWAN) and 6-month follow-up (SWAN).

Post-treatment group differences on other psychological symptoms were consistently in favour of the MBI group and significant for anxious-shy behaviour and problems falling asleep, but non-significant for oppositional behaviour, social problems, emotional lability, autism symptoms and sleeping less than peers. The post-treatment effect on well-being was non-significant. At 2- and 6-month follow-up, no significant differences in other psychological symptoms and well-being between the two groups were found. The analyses with the PP sample yielded similar results..

One third of children in the MBI group responded to the intervention (i.e. reliable pre-post improvement on the primary outcome). Our Number-Needed-to-Treat of five is considered low and comparable with that of pharmacotherapy for ADHD. A

similar response pattern was found in an RCT comparing MBI +CAU with CAU-only on core ADHD symptom decrease in adults. Long-term follow-up research is necessary to study if MBI at child age could prevent ADHD symptom persistence into adulthood.

Compared with meta-analyses on MBI for youth with ADHD described in the introduction, we found similar effects on child hyperactivity impulsivity, but smaller effects on inattentiveness. The high medication use ($\pm 80\%$) in our sample may have led to less room for improvement, mainly on inattentiveness for which pharmacotherapy is most effective. In contrast with those of Cairncross and Miller, clinical hyperactivity impulsivity was more common than clinical inattentiveness in our sample. The effect on hyperactivity impulsivity was larger according to the SWAN compared with the CPRS and remained at 6-month follow-up. Because of the wider response scale, the SWAN may have been better in capturing small improvements.