

A SYSTEMATIC REVIEW OF COGNITIVE BEHAVIOURAL THERAPY AS A NON-PHARMACOLOGICAL INTERVENTION FOR SCHOOL AGED CHILDREN WITH ADHD

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INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is considered as one of the most prevalent neurodevelopmental disorders in children (Cortese and Coghill 2018; Cabral et al. 2020). Diagnostic symptoms are divided into inattentive and hyperactive/impulsive (DSM-V, APA 2013; ICD-11, WHO 2022). ADHD symptomatology and progression presents heterogeneously with symptom presentation differing individually.

NICE guidelines recommend pharmacological interventions for severe ADHD (NICE 2018b). However, caregivers can be hesitant or unwilling to medicate children and adolescents due to fears over stigma, side-effects and uncertain long-term implications (NICE 2018a; Coletti et al. 2012).

Cognitive Behavioural Therapy (CBT) is recommended as a non-pharmacological intervention, alongside parent training, in school-aged children with a moderate severity of ADHD symptoms (NICE 2018b).

The objective of this systematic review is to evaluate the available evidence on the efficacy of CBT as an intervention for reducing the core ADHD symptoms (Inattention, Hyperactivity, Impulsivity) in school-aged children

Systematic Review Question: In an outpatient, community, or educational setting, can the use of cognitive behavioural therapy reduce the core symptoms (hyperactivity, inattention, and impulsivity) of ADHD in school-aged children with and without pharmacological interventions?

METHODOLOGY

Medline, Psychinfo, Scopus and CINAHL were searched up to 12/08/22 for Randomised Control Trials (RCTs) evaluating the efficacy of CBT compared to treatment as usual, no-treatment, and waitlist in children in mainstream school.

Inclusion	Exclusion	Limiters
Diagnosed by a medical professional Under the age of 18 Full-time, mainstream education	Co-morbid autism or tic disorder Intellectual disability	Randomised controlled trials which evaluated the efficacy of CBT compared with treatment as usual, no treatment, and waitlist, in school-aged children.

Six RCTs met eligibility criteria and were quality assessed using the Jaded Scale alongside the Cochrane Risk of Bias Tool (RoB2) to assess the risk of bias. The Critical Appraisal Skills Programme (CASP) checklist for systematic review (Critical Appraisal Skills Programme 2022) was used for narrative quality. The CONSORT (2010) checklist guided data extraction.

RESULTS

Study	Outcomes of relevance	Results
Boyer et al. (2015)	Planning and Executive Functioning—specific aim was to enhance planning skill Neuropsychological measures of Executive Functioning General Functioning	Overall impairment improvement in symptoms F(1, 471)=15.4 (p<0.001) Statistically significant
Boyer et al. (2016)	Planning and Executive Functioning—specific aim was to enhance planning skill Neuropsychological measures of Executive Functioning General Functioning	Overall impairment improvement in symptoms F(1, 471)=15.4 (p<0.001) Statistically significant. However treat with caution as large number of participants lost to follow-up.
Haugen et al. (2022)	ADHD symptom severity	Parent-rated estimated mean difference -0.08 (95% CI -2.49 - 2.32) p=0.95 Self-rated estimated mean difference 1.44 (95% CI -1.65 - 4.52) p=0.36 Teacher-rated estimated mean difference -1.51 (95% CI -5.06 - 2.04) p=0.40 Observed reduction in symptoms between the CBT and control groups did not reach statistical or clinical significance
Maric et al. (2018)	Efficacy of child versus family CBT to reduce anxiety symptoms - secondary outcome attentiveness	CCBT Pre-intervention M=72.87 (SD=9.14), Post M=62.52 (SD=8.89) 3 months M=61.12 (SD=5.72) 1 year M=59.31 (SD=5.32) FCBT pre M=74.26 (SD=7.95) Post M=63.85 (SD=7.95) 3 months M=62.4 (SD=9.32) 1 year M=59.31 (SD=8.56) No statistically significant difference between FCBT and CCBT for children with low ADHD symptoms Children with higher level ADHD symptoms got more benefit from CBT Attentiveness decreased post intervention - Effect size CCBT 1.74 and FCBT 1.87 The effect size is greater than 0.8 and is therefore considered large. Both CCBT and FCBT had a large effect on reducing the severity of attention issues
Sciberras et al. (2018)	School anxiety Strengths and Difficulties School attendance	Parent report on ADHD symptoms at 5-month follow-up: Adjusted mean difference between intervention and control = -3.6 (95% CI -14.5 - 7.3) Cohen's d=0.4 Wide CI and negative effect size - treat findings with caution
Sprich et al. (2016)	Symptom severity	Clinical Global Impression -1.17 (95% CI -1.59 - -0.94) Parent-rated score -10.93 (95% CI -12.90 - -8.98) Self-rated score -5.24 (95% CI -7.21 - -3.28) Improvements on all outcomes with CBT p<0.0001 Statistically significant. However cross-over participants did not have a follow-up so not conclusive about longer term maintenance.

Overall, the review found mixed evidence for the efficacy of CBT in school aged children with ADHD, with two of the six RCTs included yielding non-significant results (Sciberras et al. 2018; Haugan et al. 2022).

Participants ranged from 8-18 years old and had varied medication status. Different CBT interventions were compared, including individual and family therapy. Main comparisons were CBT versus either treatment as usual, waitlist, or another type of CBT.

ADHD-specific measurement scales, questionnaires and direct observations were completed by variations of participants, parents, teachers, and independent assessors. Therefore, ratings could be open to individual interpretation of symptoms.

Quality Assessments

All RCTs studies demonstrated a high risk of bias (on Jaded Scale and RoB2).

Four included studies indicated adequate methodological quality in reporting randomisation, blinding and drop-outs (Boyer et al., 2015; Sprich et al., 2016; Sciberras et al., 2018; Haugan et al., 2022).

Overall findings of this review are suggestive that CBT interventions can reduce the core ADHD symptoms.

According to independent observer ratings, and where included, parent and teacher assessments, CBT was better at reducing core symptoms than waitlist.

Specific ADHD CBT interventions were found to reduce core symptoms in independent observer ratings when compared to non-specific CBT interventions.

Results from Boyer et al.'s (2016) one year follow-up suggested that initial improvements found in Boyer et al. (2015) were sustained one year later. Although, a high number of participants were lost to follow-up.

Maric et al.'s (2018) trial included the widest age range of the included studies, including eight-year-olds and up to 18 years of age. However, the lack of information on allocation concealment and randomisation reduced confidence in these findings.

CONCLUSIONS

The evidence for the use of CBT as a non-pharmacological intervention to reduce the severity of ADHD symptoms in school-aged children is inconclusive, due to methodological issues within the study designs. This mean findings should be treated with caution.

However, review findings can go some way to supporting the use of CBT for reducing ADHD symptoms, and in changing negative patterns with adolescents.

LIMITATIONS

Limitations of the review were that **no** included studies explored:

- the use of CBT compared with no medication; therefore, conclusions cannot be drawn on the efficacy of CBT as a stand-alone treatment, rather than as an adjunct to medication.
- children under eight years of age; therefore, the review findings cannot support the use of CBT in the reduction of the severity of ADHD symptoms in this age group.

RECOMMENDATIONS

The gaps identified suggest the need for studies to include:

- larger sample sizes,
- longer follow-up periods,
- different modalities of CBT comparing groups with and without pharmacological interventions,
- modalities of CBT that are suitable for targeting the younger, not yet adolescent, age range of children.

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