
Cogmed Working Memory Training for youth with ADHD: a closer examination of efficacy utilizing evidence-based criteria

Chacko A, Feirsen N, Bedard AC, Marks D, Uderman JZ, Chimiklis A

CRD summary

The authors concluded that Cogmed Working Memory Training might be effective for children and adolescents with attention deficit hyperactivity disorder (ADHD). Despite some review limitations, the authors' conclusions and recommendations for research seem appropriate and are likely to be reliable.

Authors' objectives

To determine the short and long-term effectiveness of Cogmed Working Memory Training (CWMT) for attention deficit hyperactivity disorder (ADHD) in children and adolescents.

Searching

PsycINFO, PubMed, and the CWMT website were searched for peer-reviewed articles published in English; search terms were reported, but search dates were not.

Study selection

Studies were eligible if they assessed CWMT for children (aged four to 17 years) who had ADHD or were identified as displaying ADHD behaviour. CWMT was a commercial computer program designed to improve working memory through training. Studies had to report short-term or long-term treatment outcomes, or both. For the analysis, participants had to have been formally diagnosed with ADHD.

In the included studies, the age of the participants ranged from seven to 17 years. The percentage of males ranged from 65 to 87. Participants were diagnosed as inattentive, hyperactive, or both. Some participants had additional diagnoses, such as oppositional defiant, conduct, or anxiety disorder. Some participants were receiving medication. The studies were published between 2005 and 2012.

The authors did not state how many reviewers selected studies for inclusion.

Assessment of study quality

Study quality was assessed using methods developed by Nathan and Gorman in 2002, to categorise studies into type (one to six) using aspects of their design and methods. Type one was rigorous, randomised, prospective clinical trials. Type two was clinical trials in which an intervention was tested, but at least one aspect of the type one trial was missing. Type six were case studies, essays or opinion papers.

The authors did not state how many reviewers assessed study quality.

Data extraction

The data were extracted for trained and untrained cognitive tasks, behavioural observations, and teacher- and parent-reported outcomes. These were used to calculate standardised mean differences.

Three reviewers independently extracted the data. Any disagreements were resolved by discussion.

Methods of synthesis

The data were combined in a narrative synthesis by the evidence-based treatment criteria of the Society for Clinical Child and Adolescent Psychology. These criteria included using operationally defined treatment methods, reliable and valid ADHD outcomes, and appropriate data analysis. Studies not fulfilling these criteria were discussed separately.

Results of the review

Seven studies were included. Four randomised controlled trials were analysed, with a total of 191 participants. For quality, one trial was rated as type one, and the other three were rated as type two.

There were mixed effects for the benefit of CWMT for children with ADHD.

Compared with placebo (a low-level working memory version of CWMT), CWMT at three months had a moderate effect on trained and untrained cognitive tasks, and on parent-reported symptoms (one trial). In another trial using the same placebo, statistically significant effects in favour of CWMT were reported only for trained cognitive tasks and behavioural observations.

Compared with a waiting-list control, CWMT had a large effect on parent-reported symptoms, with no statistically significant differences for any other domains (one trial).

Compared with an active comparison of Academy of Math, CWMT had a small effect on trained cognitive tasks only (one trial).

The other three studies (one randomised controlled trial and two before-and-after studies) were described separately. They did not have ADHD symptom outcomes, and did not include participants with a formal diagnosis of ADHD.

Authors' conclusions

CWMT might be effective for young people with ADHD.

CRD commentary

The review question was broadly defined. Some relevant sources were searched, but the restriction to peer-reviewed studies, published in English, means that some data may have been missed. Methods to reduce reviewer error and bias were used for extracting data, but it was unclear whether similar methods were used for other processes, such as selecting studies.

A narrative synthesis was appropriate, given the diversity of the studies in their participants, control groups and outcomes. The interpretation of the synthesis was difficult because confidence intervals were not presented for the treatment effect estimates. The quality assessment was basic, with no information on common trial biases, but some limitations were discussed, including the few studies and participants, and differences between studies.

Despite the aforementioned review limitations, the authors' conclusions and recommendations for research seem appropriate and are likely to be reliable.

Implications of the review for practice and research

Practice: The authors stated that confidence in the effectiveness of behavioural interventions and specific medications for ADHD in youth was greater than it was for CWMT. Behavioural interventions and specific drugs should be considered first.

Research: The authors stated that studies should include a diversity of young people with ADHD and their families; have more diverse outcomes, such as observed objective outcomes and functional impairment; and evaluate the hypothesised model of therapeutic benefit.

Funding

Funded by the National Institute of Mental Health, USA.

Bibliographic details

Chacko A, Feirsen N, Bedard AC, Marks D, Uderman JZ, Chimiklis A. Cogmed Working Memory Training for youth with ADHD: a closer examination of efficacy utilizing evidence-based criteria. *Journal of Clinical Child and Adolescent Psychology* 2013; 42(6): 769-783

PubMedID

23668397

DOI

10.1080/15374416.2013.787622

Indexing Status

Subject indexing assigned by NLM

MeSH

Adolescent; Attention Deficit Disorder with Hyperactivity /physiopathology /therapy; Child; Cognitive Therapy; Evidence-Based Medicine; Humans; Memory, Short-Term /physiology; Randomized Controlled Trials as Topic; Treatment Outcome

AccessionNumber

12013027572

Date bibliographic record published

04/06/2013

Date abstract record published

05/08/2014

Record Status

This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.