Game-based combined cognitive and neurofeedback training using Focus Pocus reduces symptom severity in children with diagnosed AD/HD and subclinical AD/HD.

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Abstract

Previous studies report reductions in symptom severity after combined working memory (WM) and inhibitory control (IC) training in children with AD/HD. Based on theoretical accounts of the role of arousal/attention modulation problems in AD/HD, the current study examined the efficacy of combined WM, IC, and neurofeedback training in children with AD/HD and subclinical AD/HD. Using a randomized waitlist control design, 85 children were randomly allocated to a training or waitlist condition and completed pre- and post-training assessments of overt behavior, trained and untrained cognitive task performance, and resting and task-related EEG activity. The training group completed twenty-five sessions of training using Focus Pocus software at home over a 7 to 8-week period. Trainees improved at the trained tasks, while enjoyment and engagement declined across sessions. After training, AD/HD symptom severity was reduced in the AD/HD and subclinical groups according to parents, and in the former group only according to blinded teachers and significant others. There were minor improvements in two of six near-transfer tasks, and evidence of far-transfer of training effects in four of five far-transfer tasks. Frontal region changes indicated normalization of atypical EEG features with reduced delta and increased alpha activity. It is concluded that technology developments provide an interesting a vehicle for delivering interventions and that, while further research is needed, combined WM, IC, and neurofeedback training can reduce AD/HD symptom severity in children with AD/HD and may also be beneficial to children with subclinical AD/HD.