

Improvement of Attention-Deficit/Hyperactivity Disorder Symptoms in School-Aged Children, Adolescents, and Young Adults with Autism via a Digital Smartglasses-Based Socioemotional Coaching Aid: Short-Term, Uncontrolled Pilot Study.

Vahabzadeh A, Keshav NU, Salisbury JP, Sahin NT.

JMIR Ment Health. 2018 Mar 24;5(2):e25.

doi: 10.2196/mental.9631.

Abstract

BACKGROUND:

People with autism spectrum disorder (ASD) commonly experience symptoms related to attention-deficit/hyperactivity disorder (ADHD), including hyperactivity, inattention, and impulsivity. One-third of ASD cases may be complicated by the presence of ADHD. Individuals with dual diagnoses face greater barriers to accessing treatment for ADHD and respond less positively to primary pharmacologic interventions. Nonpharmacologic technology-aided tools for hyperactivity and inattention in people with ASD are being developed, although research into their efficacy and safety remains limited.

OBJECTIVE:

The objective of this preliminary study was to describe the changes in ADHD-related symptoms in children, adolescents, and young adults with ASD immediately after use of the Empowered Brain system, a behavioral and social communication aid for ASD running on augmented reality smartglasses.

METHODS:

We recruited 8 children, adolescents, and young adults with ASD (male to female ratio of 7:1, mean age 15 years, range 11.7-20.5 years) through a Web-based research signup form. The baseline score on the hyperactivity subscale of the Aberrant Behavioral Checklist (ABC-H), a measure of hyperactivity, inattention, and impulsivity, determined their classification into a high ADHD-related symptom group ($n=4$, $ABC-H \geq 13$) and a low ADHD-related symptom group ($n=4$, $ABC-H < 13$). All participants received an intervention with Empowered Brain, where they used smartglasses-based social communication and behavioral modules while interacting with their caregiver. We then calculated caregiver-reported ABC-H scores at 24 and 48 hours after the session.

RESULTS:

All 8 participants were able to complete the intervention session. Postintervention ABC-H scores were lower for most participants at 24 hours ($n=6$, 75%) and for all participants at 48 hours ($n=8$, 100%). At 24 hours after the session, average participant ABC-H scores decreased by 54.9% in the high ADHD symptom group and by 20% in the low ADHD symptom group. At 48 hours after the session, ABC-H scores compared with baseline decreased by 56.4% in the high ADHD symptom group and by 66.3% in the low ADHD symptom group.

CONCLUSIONS:

This study provides initial evidence for the possible potential of the Empowered Brain system to reduce ADHD-related symptoms, such as hyperactivity, inattention, and impulsivity, in school-aged children, adolescents, and young adults with ASD. This digital smartglasses intervention can potentially be targeted at a broader array of mental health conditions that exhibit transdiagnostic attentional and social communication deficits, including schizophrenia and bipolar disorder. Further research is required to understand the clinical importance of these observed changes and to conduct longitudinal studies on this intervention with control groups and larger sample sizes.