

Effect of Exercise and Mindfulness on Cognitive and Psycho-Emotional Functioning in Children with ADHD

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Abstract : Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common neurodevelopmental disorders affecting approximately 6% of children worldwide. ADHD is characterized by a combination of persistent deficits including impaired inhibitory control, working memory and task-switching. Many children with ADHD also have comorbid mental health issues such as anxiety and depression. There are several treatment options to manage ADHD impairments, including drug and behavioural management therapy, but they all have drawbacks, such as worsening mood disturbances or being inaccessible to certain demographics. Both physical exercise and mindfulness meditation serve as alternative options to potentially help mitigate ADHD symptoms. Although there is extensive support for the benefits of long-term physical exercise or mindfulness meditation programs, there is insufficient research investigating how acute bouts (i.e., single, short bouts) can help children with ADHD. Thus, the current study aimed to understand how single, short bouts of exercise and mindfulness meditation impacts executive functioning and psycho-emotional well-being in children with ADHD, as well as to directly compare the efficacy of these two interventions. The study used a pre- post-test, within-subjects design to assess the effects of a 10-minute bout of moderate intensity exercise versus a 10-minute bout of mindfulness meditation (versus 10 minutes of a reading control) on the executive functioning and psycho-emotional well-being of 16 children and youth with ADHD aged 10-14 (male=11; White=80%). Participants completed all three interventions: 10 minutes of exercise, 10 minutes of mindfulness meditation, and 10 minutes of reading (control). Executive functioning (inhibitory control, working memory, task-switching) and psycho-emotional well-being (mood, self-efficacy) were assessed before and after each intervention. Mindfulness meditation promoted executive functioning, while exercise enhanced positive mood and self-efficacy. Critically, this work demonstrates that a single, short bout of mindfulness meditation session can promote inhibitory control among children with ADHD. This is especially important for children with ADHD as inhibitory control deficits are among the most pervasive challenges that they face. Furthermore, the current study provides preliminary evidence for the benefit of acute exercise for promoting positive mood and general self-efficacy for children and youth with ADHD. These results may increase the accessibility of acute exercise for children with ADHD, providing guardians and teachers a feasible option to incorporate just 10 minutes of exercise to assist children emotionally. In summary, this research supports the use of acute exercise and mindfulness meditation on varying aspects of executive functioning and psycho-emotional well-being in children and youth with ADHD. This work offers important insight into how behavioural interventions could be personalized according to a child's needs.

Keywords : attention-deficit hyperactivity disorder (ADHD), acute exercise, mindfulness meditation, executive functioning, psycho-emotional well-being

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