Effects of physical activity on executive function and motor performance in children with ADHD

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Abstract

Children with Attention-Deficit/Hyperactivity Disorder (ADHD) often show major deficits in motor and cognitive abilities. Pharmacological treatment is commonly used to reduce ADHD symptoms. However, non-pharmacologic treatment methods would be preferred by parents, children and psychiatrists. Physical activity (PA) has been demonstrated to improve cognitive functioning in healthy populations. It can be hypothesized that there are similar beneficial effects in children with ADHD, however, very little is known about this issue. The purpose of the present study was to determine whether PA improves cognitive performance in children with ADHD.

A total of 43 children with ADHD (32 boys and 11 girls) aged between seven and 12 years took part in the study. To investigate whether potential effects on executive functioning depend on the kind of PA, two different 12-week training programs were implemented. The study-design consisted of two experimental groups (EG1, n=13; EG2, n=14) and a wait-list control group (CG, n=16). Participants in EG1 took part in a training which focused on the abilities ball handling, balance and manual dexterity. Participants in EG2 group were trained in sports without a specific focus. The children in the CG group received no intervention. Participants completed assessments of working memory (WM) and motor performance before, immediately after the first training week and one week after the last session. After the 12-week intervention period, several measures of the EG1 and EG2s significantly improved over time. Furthermore, between group comparisons demonstrated significant improvements in both EG1 and EG2 compared to the CG in variables assessing WM performance and motor performance. These findings support the hypothesis that long-term PA has a positive effect on executive functions of children with ADHD, regardless of the specificity of the PA. The outcomes indicated that regular PA can be used as a complementary or alternative non-pharmacologic treatment for ADHD.