Let’s Get Physical: The Effectiveness of Physical Activity on Executive Functioning in Children with ADHD
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Background
- Worldwide, 129 million children have been diagnosed with Attention-Deficit-Hyperactivity Disorder (ADHD).
- An important outcome for this population is improved executive functioning (Thomas et al., 2015).
- Researchers have found evidence to support the framework that physical activity improves executive functioning skills in school-aged children diagnosed with ADHD (Ziereis & Jansen, 2015).
- School-aged children with ADHD have significant deficits in their executive functioning skills, specifically attention, task shifting, inhibition, working memory and planning (Ziereis & Jansen, 2015).
- The purpose of this project is to present a systematic review about the effectiveness of physical activity-related treatment on specific measures of executive functioning (i.e., inhibition, attention, working memory, task shifting), in school-aged children with ADHD.

Research question:
- Do physical activities improve subsequent measures of executive function in school-age children with ADHD from pre-test to post-test?

Literature Search
- The following databases/search techniques were used to retrieve articles: CINAHL, Science Direct, ProQuest, PubMed, SAGE Journal, and PsycNFO.

The search terms/key words used were:
- Athletic Training AND ADHD
- Exercise Therapy AND ADHD executive function
- Physical Therapy AND ADHD executive function
- Physiotherapy AND ADHD executive function
- Exercise Intervention AND ADHD executive function
- Impact of physical activity on executive functioning

Additional search criteria included:
- Published between 2000-2017
- Standardized assessments that measure executive functioning
- Pre-test and post-test measures
- Included school-aged participants (ages 5-13)
- Patients with medical diagnosis of ADHD

Results
- Studies were categorized based on the following subsequent measures of executive function: attention, inhibition, task shifting, and working memory.
- Nine control trials adhered to inclusion criteria.
- Evidence from studies supported the framework that physical activity improves executive functioning skills in school-aged children diagnosed with ADHD.

Effect Sizes (Cohen’s d):
- Studies demonstrated an average effect size of 1.09.
- Thus, results indicate that outcome measures of executive functioning improved significantly from pre-test to post-test.
- Attention resulted in small to large effect sizes, inhibition and working memory both yielded large effect sizes, and task shifting demonstrated a small effect size.

Limitations:
- Due to the limited number of standardized assessments that measure planning skills, research for this part of executive function in children with ADHD is needed.
- The studies reviewed did not all control for use of medication.
- Post-test measures were taken anywhere from minutes to one week after completion of treatment.

Clinical Recommendations
- Findings suggest:
  - Physical activity of various kinds can improve the executive functioning of children with ADHD.
  - Physical activity appears to be a beneficial treatment approach to improve executive functioning in children with ADHD.
- Clinical Recommendations:
  - SLPs should consider implementing physical activity before treatment to enhance attention and other executive functioning skills in children with ADHD.
- Future Directions:
  - Include long-term, systematic treatments, with larger sample sizes in the treatment settings.
  - Request follow-up observations to determine the long-term effects of the treatment.
  - Include only participants not using ADHD medication.

References