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Effectiveness of Interactive Metronome Training for Children with ADHD

WESTERN MICHIGAN UNIVERSITY

Bethany Fox and Corinne Leer

Case

The Interactive Metronome (IM) is an assessment and training tool with the goal of improving Neurotiming through the use of rhythm and repetition. The product is based on the idea that the different regions of the brain need to communicate in a synchronized fashion to allow us to successfully complete all physical and cognitive functions. IM aims to increase this timing and synchronization through an interactive computer-based training tool that involves having the client perform an exercise to a metronome beat, while providing audio and visual feedback to help them improve their efficiency.



1 Ask: Research Question

What is the effectiveness of Interactive Metronome (IM) training for improving functioning among children with ADHD?

2a Acquire: Search

Databases: PubMed, Scopus, ClinicalKey, & Google Scholar

Patient/Client Group: Children, pediatrics, ADHD

Intervention: Interactive metronome, synchronized metronome

Comparison: no treatment, standard OT

Outcome(s): functioning, attention, concentration, academic performance, behavior, cognitive functioning, coordination, motor functioning

2b Acquire: Selected Articles

Leisman, Mualem, Machado (2013): A quasi-experimental design that examined the effect of Synchronized metronome intervention in the areas of academics and overall functioning of children with ADD/ADHD.

Cosper, Leer, Peters, & Bishop (2009): A pretest/ posttest design that examined the efficacy of Interactive Metronome training on attentional control and motor functioning in a group of children with mixed attentional and motor coordination disorders

Shaffer, Jacokes, Cassily, Greenspan, Tuchman, & Stemmer (2001): A randomized control-group pretest/ posttest design that examined the effects of the IM on motor and cognitive skills in a group of children with ADHD.

3a Appraise: Study Quality

Leisman, Mualem, Machado (2013): Level 3, n= 159. Strengths: longitudinal, used randomization in selection of treatment group, and included control group. Limitations: background characteristics not comparable between groups, number of participants in the control group was much smaller, and the control group was a convenience sample.

Cosper, Leer, Peters, & Bishop (2009): Level 3, n= 12. Strengths: longitudinal, reliable measures, and potential to be generalized. Limitations: lack of control group, comorbid diagnoses, and background characteristics not comparable between groups.

Shaffer, Jacokes, Cassily, Greenspan, Tuchman, & Stemmer (2001): Level 2, n= 56. Strengths: longitudinal, RCT, reliable measures. Limitations: potential interaction effects, inclusion of only males, limited age range, and did not provide complete quantitative data.

3b Appraise: Study Results

Leisman, Mualem, Machado (2013): Synchronized metronome was effective in improving performance on all academic subtests ($p \leq .01$) and decreasing behaviors related to ADD/ADHD ($p < .001$) when compared to control group.

Cosper, Leer, Peters, & Bishop (2009): IM improved motor coordination, most notably seen in visuomotor control ($p = .02$) and visual relations time ($p < .05$). The study did not show support for IM causing improvements in sustained attention.

Shaffer, Jacokes, Cassily, Greenspan, Tuchman, & Stemmer (2001): IM produced better outcomes in the areas of attention, motor control, language processing, reading, and self-regulation when compared to those who received video game treatment or no treatment. Of the 58 variables measured 53 showed improvement ($p < .001$).

4 Apply: Conclusions for Practice

Children with ADHD may show functional improvements from IM, specifically when addressing academic, behavioral symptoms, and motor control. IM may be a helpful OT tool to utilize, but future research is needed to examine the effectiveness of IM with other therapies and the impact on ADL/IADLs. Future research is needed to help clarify which areas of function IM is most effective in addressing. Additionally, more studies are needed that utilize randomization, include a larger sample size, and increase homogeneity of control and treatment groups.

References

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Shaffer, R. J., Jacokes, L. E., Cassily, J. F., Greenspan, S. I., Tuchman, R. F., & Stemmer, P. J. (2001). Effect of interactive metronome training on children with ADHD. *The American Journal of Occupational Therapy*, 55, 155-162. doi:10.5014/ajot.55.2.155

Interactive Metronome showed positive results for improving function in academic performance, motor coordination, and behavioral symptoms in children with ADHD.

