Abstract

Effects of Movement-Based Interventions on Imitation and Praxis Skills in Children With Autism Spectrum Disorder: A Comparison of Face-to-Face Versus Telehealth Modes of Delivery

Madeline Kaba[1]; Alekya Bokka[1]; Wan-Chun Su[2]; Corina Cleffi[2]; Nidhi Amonkar[1]; Anjana Bhat[2]; Sudha Srinivasan[1]

[1]Department of Kinesiology, University of Connecticut, Storrs, CT, United States

[2]Biomechanics and Movement Science, University of Delaware, Newark, DE, United States

Corresponding Author:
Sudha Srinivasan
Department of Kinesiology
University of Connecticut
3107 Horsebarn Hill Road
U-4137
Storrs, CT, 06269
United States
Phone: 1 8604866192
Email: sudha.srinivasan@uconn.edu

Abstract

Background: Children with autism spectrum disorder (ASD) exhibit poor imitation, movement planning, and praxis skills that in turn compound their core social communication and behavioral difficulties.

Objective: Our randomized controlled trial compares the effects of 2 whole-body movement interventions (creative movement ["Play"] and general exercise ["Move"]) to those of a seated play standard-of-care intervention ("Create") on imitation and praxis skills in children with ASD. As part of this clinical trial, we also compare face-to-face (F2F) versus telehealth (TH) modes of intervention delivery in each of the three groups.

Methods: A total of 44 children with ASD aged between 5 and 14 years participated in this 10-week study. Children were matched at baseline and assigned to the Play, Move, or Create groups (n=14-15/group). Approximately half of the children in each group were seen F2F, while the other half were seen via TH. Training was provided 2 times/week (60-90 minutes/session) for 8 weeks. We administered the Bilateral Motor Coordination (BMC) and Postural Praxis (PP) subtests of the Sensory Integration and Praxis Test (SIPT) at pretest and posttest and assessed spatial and temporal errors in movement execution during both tests. We calculated the percent total imitation error score for both subtests.

Results: For the SIPT-PP, we found a reduction in percent total errors from pretest to posttest in the Play (pretest: mean 15.8%, SE 1.1%; posttest: mean 12.9%, SE 1.1%; $P \leq .05$), Move (pretest: mean 17.1%, SE 1.4%; posttest: mean 14.8%, SE 1.2%; $P \leq .05$), and Create groups (pretest: mean 16.5%, SE 1.5%; posttest: mean 12.7%, SE 1.7%; $P \leq .05$). There were no statistically significant differences in the percent reduction in total errors among children seen F2F versus via TH in the Play (F2F: mean 3.4%, SE 1.5%; TH: mean 2.4%, SE 2.1%; $P=.72$), Move (F2F: mean 2.6%, SE 1.6%; TH: mean 2.1%, SE 1.5%; $P=.84$), and Create groups (F2F: mean 6.1%, SE 1.2%; TH: mean 3.4%, SE 1.8%; $P=.22$). For the SIPT-BMC, children significantly reduced their percent total error scores from pretest to posttest in the Play group (pretest: mean 8.6%, SE 2.4%; posttest: mean 3.9%, SE 0.7%; $P \leq .05$) but not in the Move and Create groups. Specifically, children in the Play group improved on spatial errors (pretest: mean 9.1%, SE 1.9%; posttest: mean 5.4%, SE 1.2%; $P \leq .05$) and also showed a nonsignificant trend for improvement in temporal errors (pretest: mean 9.2%, SE 3.3%; posttest: mean 3.1%, SE 0.6%; $P=.06$). Similar to the SIPT-PP, we found no significant differences in the percent reduction in total errors among children seen F2F versus via TH (F2F: mean 2.0%, SE 1.5%; TH: mean 7.3%, SE 3.8%; $P=.23$).

Conclusions: Our pilot data suggest that imitation-based gross and fine motor training activities led to improved postural imitation skills in children with ASD across all 3 groups. However, only the Play group that received rhythmic movement practice improved on the BMC subtest of the SIPT. Our findings suggest that improvements in imitation and praxis skills are highly training-specific in children with ASD. The lack of significant differences between the F2F and TH modes across all groups

suggests that TH could be a successful method of intervention delivery for promoting imitation and praxis skills in children with ASD.

Conflicts of Interest: None declared.

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KEYWORDS

autism spectrum disorder; children; movement interventions; imitation; praxis

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