

Abstract

Effects of a Whole-body General Movement Intervention on Functional Muscle Strength of Children With Autism Spectrum Disorder: Results From a Comparison of Face-to-face Versus Telehealth-Based Intervention Delivery

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Abstract

Background: Children with autism spectrum disorder (ASD) demonstrate impairments in postural strength and control, both of which are important for activities of daily living. With the onset of the COVID-19 pandemic, more focus has been placed on telehealth interventions.

Objective: Our randomized controlled trial assessed the effects of a general movement (GM) intervention compared to a standard-of-care seated play (SP) intervention delivered via face-to-face (F2F) and telehealth (TH)-based modes of intervention delivery in children with ASD.

Methods: Thirty 5- to 14-year-old children were matched at baseline and randomly assigned to the GM or SP groups. Children participated in a 10-week study with pretests and posttests conducted during the first and last weeks and training in the intermediate 8 weeks (2 sessions/week at 1.5 hours/session). The strength subtest of the Bruininks-Oseretsky Test of Motor Proficiency (BOT-2) and a custom-developed functional strength test were administered at pretest and posttest. In addition, we assessed functional strength using 15 upper and lower body exercises that were administered during early and late training sessions. All strength tests were coded for errors in movement form and movement quality during execution.

Results: On the BOT-2, the GM group (pretest: mean 8.3, SE 1.1; posttest: mean 10.31, SE 1.3; $P=.007$) but not the SP group showed improvements in scaled scores on the strength subtest. There were no differences in the amount of change for children seen F2F versus TH in the GM group (F2F: mean 2.3, SE 0.8; TH: mean 1.8, SE 0.9; $P=.70$). In the GM group, 77% of participants showed improvement in front raises and 50% improved on both sumo squats and donkey kicks. Of the 15 upper and lower body functional strength exercises performed, 7 provided significant results at a significance level of $P=.05$. For the upper body, these included back row (early: mean 81.3, SE 4.6; late: mean 57.0, SE 7.8; $P=.01$), spread your wings (early: mean 55.5, SE 6.0; late: mean 32.1, SE 5.4; $P=.008$), press ups (early: mean 72.1, SE 5.3; late: mean 46.8, SE 8.0; $P=.01$), and superman reach (early: mean 74.4, SE 2.8; late: mean 58.9, SE 6.8; $P=.009$). For the lower body, these included donkey kicks (early: mean 69.2, SE 2.9; late: mean 40.2, SE 6.0; $P<.001$), do-a-dot (early: mean 77.4, SE 3.3; late: mean 56.3, SE 6.3; $P=.008$), and superman kick (early: mean 71.9, SE 2.9; late: mean 49.8, SE 6.8; $P=.008$). Across all 7 moves, a comparable or higher proportion of children seen via TH showed improvement in movement performance scores compared to children seen F2F. For 6 of 7 movements, the mean reduction in percent movement performance errors (early vs late) was greater for children seen via TH compared to children seen via F2F. In addition, for superman kick (sk), donkey kick (dk), press ups (pu), and superman reach (sr) exercises, a higher proportion of children seen via TH compared to F2F improved movement performance error scores with training (sk: 80% TH vs 50% F2F; dk: 90% TH vs 60% F2F; pu: 100% TH vs 50% F2F; sr: 90% TH vs 25% F2F).

Conclusions: Although preliminary, our data suggest that TH is an effective mode of delivery of gross motor interventions and can be used to promote functional upper and lower body muscle strength in children with ASD.

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KEYWORDS

autism spectrum disorder; functional strength; gross motor interventions

Multimedia Appendix 1

Outline of this study and figures of the results.

[\[PDF File \(Adobe PDF File\), 2205 KB-Multimedia Appendix 1\]](#)

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