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Evaluating dependent measures of motor skill and health among adults with autism spectrum disorder and an intellectual disability

Kelly Carr, Chad A. Sutherland, Nadia R. Azar, and Sean Horton

Introduction: To date, much of ASD-related research focuses on children, while studies specific to adults remain limited. This is worrisome as the core deficits of ASD create life-long impairments. While the diagnostic characteristics of ASD include: (1) impairment in social communication and interaction, and (2) engagement in repetitive and stereotyped behaviours, interests, and activities, deficits in motor control have recently been acknowledged as an additional core symptom of ASD. Furthermore, it has been documented that compared to typically developing peers, individuals with ASD have lower levels of physical activity, lower levels of fitness, and increased rates of obesity and obesity-related secondary health conditions. However, through the implementation of a physical exercise program, evidence suggests that health and motor skills can be improved. While these initial results are promising, it is imperative to have reliable and valid dependent measures that assess the effectiveness of such interventions. To ensure that a dependent measure is assessing change in performance related to an intervention, performance on the dependent measure should remain relatively stable provided that an individual does not participate in relevant practice or training. As such, this study evaluated several motor skill and health measures among adults with ASD and an intellectual disability (ID). By assessing performance on these measures without engagement in an intervention, we can determine the appropriateness in measuring performance change when an intervention is implemented.

Methods: Nine adults diagnosed with ASD-ID (8 males; 1 female) completed a 12-week protocol of four motor control assessments (Jebsen Test of Hand Function, Modified 25 Grooved Pegboard Test, Modified Box and Block Test, and the Stick Catching Test), and three health assessments (Sit and Reach, grip strength, and body weight). All assessments were completed at week 0 and week 12.

Results: Results of each assessment are provided in Table 1.

Assessment	Week 0	Week 12	% Difference
Jebsen Test of Hand Function	58.69 seconds	59.58 seconds	1.52%
Modified 25 Grooved Pegboard	13.91 pegs	12.88 pegs	7.40%
Modified Box and Block	33.97 blocks	32.64 blocks	3.92%
Stick Catching Test	55.80 cm	55.75 cm	0.09%
Sit and Reach	7.04 cm	9.47 cm	34.52%
Grip Strength	21.56 kg	20.38 kg	5.47%
Body Weight	86.57 kg	86.18 kg	0.45%

Discussion: Performances on all assessments, except for the Sit and Reach, remained similar between week 0 and week 12. Differences in trials were less than 2% for the Jebsen Test of Hand Function, the Stick Catching Test, and Body Weight, identifying these assessments as the most reliable over time. The Modified 25 Grooved Pegboard, Modified Box and Block, and grip strength revealed changes between 3% and 8%. The Sit and Reach Test evidenced the largest percent difference from week 0 to week 12 at a 34.52% change. As such, the Sit and Reach Test may be the least reliable assessment examined due to the presence of a practice effect.