

Are Exercise Interventions Effective in Improving Cognition in ASD/ADHD?

Tan, Pooley, and Speelman conducted a meta-analysis that analyzed research studies involving exercise interventions for individuals diagnosed with autism spectrum disorder (ASD) and/or attention deficit hyperactivity disorder (ADHD). This research focused specifically on exercise-based interventions and their influence on some aspect of cognitive performance (i.e., on-task, learning tasks, executive functioning). Twenty-two papers met inclusion criteria (72% focused on ADHD) and represented 579 participants (age range 3–25 years). All exercise behaviors were aerobic in nature, and there were no significant differences in terms of duration of the exercise, number of sessions, or the exercise type (i.e., single activity or mixed activity). Meta-analytic results found that the mean effect size showed a small to moderate positive effect of exercise interventions on aspects of cognition ($r = .235$). Specifically, on-task duration or simple learning tasks had a stronger effect size ($r = .526$) than executive-functioning tasks ($r = .180$). Various forms of exercise interventions appear to increase certain aspects of cognition, both behaviorally and via executive functioning, postexercise in 61.75% of individuals with ASD and/or ADHD.

Tan, B.W.Z., Pooley, J.A., & Speelman, C.P. (2016). A meta-analytic review of the efficacy of physical exercise interventions on cognition in individuals with autism spectrum disorder and ADHD. *Journal of Autism and Developmental Disorders*, 46, 3126–3143.

Explosive Resistance Training in Adults With Cerebral Palsy

Impaired gait function in adults with cerebral palsy (CP) is due in part to reduced ability to generate spontaneous muscle force. This study investigated a 12-week intervention with explosive and progressive resistance training (PRT) on ankle dorsiflexion, ankle stiffness, and gait function in adults with CP. A total of 35 adults with CP participated in either the PRT or a nontraining control group. Training groups were not randomly assigned. The PRT was 12 consecutive weeks, held 3 days/week, with three sets per exercise. There were six total exercises, with the primary focus on seated ankle dorsiflexion. The authors reported increased ankle dorsiflexion and greater ankle range of motion after PRT but no changes in functional gait. Of clinical relevance, the explosive PRT did not appear to affect passive or reflex stiffness in the PRT group. The authors suggest that this exploratory trial justifies examining the long-term effects of explosive PRT in adults with CP as part of clinical practice. This publication should be of interest to researchers and practitioners in physical therapy and personal training.

Kirk, H., Geertsen, S.S., Lorentzen, J., Krarup, K.B., Bandholm, T., & Nielsen, J.B. (2016). Explosive resistance training increases rate of force development in ankle dorsiflexors and gait function in adults with cerebral palsy. *Journal*

of *Strength and Conditioning Research*, 30(10), 2749–2760. doi:10.1519/JSC.0000000000001376

Cardiac Function in Elite Paracyclists With SCI

The number of athletes with spinal-cord injuries (SCI) competing in Paralympic competition continues to increase. However, limited echocardiographic research specific to this population has been done. This study examined the association between level of SCI and cardiac structure and function in elite-level Para-athletes. A total of 63 elite Paralympic cycling athletes participated in the study, including 44 hand cyclists with SCI (9 cervical, 10 high thoracic, and 25 low thoracic) and a control group of 19 blind tandem cyclists without SCI. Participants were assessed via high-resolution echocardiography at a single time point occurring 24–48 hours before an international competition. Multivariate analyses indicated that athletes with cervical SCI had significantly lower left-ventricle and posterior-wall thickness, left-ventricle mass, and left atrial volume than athletes with other levels of SCI and blind athletes without SCI. These results have clinical implications, as normative cardiac values may not be appropriate for athletes with cervical SCI. This study should be of interest to researchers examining exercise physiology, cardiology, and training specific to Paralympic athletics.

Kim, J.H., Trilk, J.L., Smith, R., Asif, I., Maddux, P.T., Ko, Y.A., & Emery, M.S. (2016). Cardiac structure and function in elite para-cyclists with spinal cord injury. *Medicine & Science in Sports & Exercise*, 48(8), 1431–1437. doi:10.1249/MSS.0000000000000921

Motor Proficiency in Children With Prader-Willi Syndrome

Prader-Willi syndrome (PWS) is a neurodevelopmental genetic disorder with a variety of phenotypic characteristics. Most notably, body-mass regulation is often challenging to individuals with PWS. However, there is limited evidence on motor proficiency specific to obese children with PWS. This study used the Bruininks-Oseretsky Test of Motor Proficiency (BOT-2) to compare motor function in 18 obese children with PWS with a group of 44 obese children without a disability. Children with PWS scored significantly lower on all subtests of the BOT-2 than a sample of obese children without a disability and significantly below normative means on all motor composites. All 18 of the children with PWS exhibited total motor composite scores in the well-below-average to below-average range. These results may have clinical implications for a population at risk for obesity, as previous studies have demonstrated negative associations between motor proficiency and body mass. It is recommended that clinicians identify and intervene to address these motor difficulties. This study should be of interest to researchers designing body-weight interventions for children with PWS.

Lam, M.Y., Rubin, D.A., Duran, A.T., Chavoya, F.A., White, E., & Rose, D.J. (2016). A characterization of movement skills in obese children with and without Prader-Willi syndrome. *Research Quarterly for Exercise and Sport*, 87(3), 245–253. doi:10.1080/02701367.2016.1182113