

The Relationship between Postural Control and Motor Proficiency in Children with Prader-Willi Syndrome and with Obesity

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ABSTRACT

Prader-Willi Syndrome (PWS) is a rare neurodevelopmental genetic disorder that can lead to obesity. Children with PWS exhibit poor motor skills and poor postural control. Postural control is defined as the ability to regulate sensory information to maintain a controlled, upright posture. Underdeveloped vestibular and proprioceptive systems, shown in PWS, may interfere with maintaining posture and performing fundamental skills that require effective sensorimotor integration. Obesity (OB) can also be negative to postural control and motor skill development. **PURPOSE:** This study determined the relationship between postural control and motor proficiency in children with PWS and those with OB but without PWS. **METHODS:** Participants were 18 children with PWS (male=10, female=8; 9.9 ± 1.1 years old) and 51 children with OB (male= 25, female= 26; 9.11 ± 1.13 years old). Postural control was determined through the Sensory Organization Test (SOT) and motor proficiency was determined using the Bruininks-Oseretsky Test of Motor Proficiency-Second Edition (BOT2). Three subtests from the BOT2 were used for the analysis (bilateral coordination, balance and running speed & agility) as it was speculated performance in these skills is related to postural control. Independent T-tests were used to compare postural control and motor proficiency between the groups. Pearson product correlations evaluated the associations between postural control and motor proficiency skills with a $p < 0.05$ used for statistical significance. **RESULTS:** Children with PWS showed lower postural control, bilateral coordination, static balance and running speed & agility than those with OB ($p < .001$ for all). In children with PWS postural control was positively associated with bilateral coordination ($r = .704$), static balance ($r = .665$), and running speed and agility ($r = .633$). In those with OB postural control was associated only with running speed & agility ($r = .305$). **CONCLUSION:** In PWS postural control was positively associated with better performance in motor skills requiring static and or dynamic balance. In children with OB but without diagnosed neurodevelopmental issues only a weak association was shown. In PWS, targeting sensory motor integration skills affecting postural control may improve overall motor proficiency in this population.