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Predicting Gross Motor Skills in Children: Data from the 2012 NHANES National Youth Fitness Survey

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Gross motor development may be influenced by physical activity and fitness, and obesity thus making it an important component of overall health. However, difficulties in assessing gross motor skills highlight the benefit of predicting performance via measures of body composition and strength/fitness in children. **PURPOSE:** Determine if birth weight, body composition, and core strength are significant predictors of gross motor skills (GMS) in children 3-6 years old. **METHODS:** Data from 177 boys and 178 girls from the 2012 National Health and Nutrition Examination Survey National Youth Fitness Survey were used for this analysis. BMI, sum of skinfolds (SF), and waist-to-height ratio (WHR) were calculated and used to assess body composition, core strength was assessed via a timed plank test, and locomotor (LOC) and object control (OC) skills were evaluated through the Test for Gross Motor Development-2 (TGMD-2). Gross motor quotient (GMQ) was calculated from the sum of LOC and OC. Separate linear regression models for birth weight, SF, WHR, BMI, and core strength were used to predict TGMD-2 scores. Age, race/ethnicity, annual household income (AHI), and height were used as co-variates in the models. **RESULTS:** Core strength was a significant predictor of LOC (β=0.311, p<.001) and OC (β=0.301, p<.001) skills and the GMQ in girls (β=0.450, p<.001). Furthermore, when adjusted for age and AHI, the GMQ was significantly predicted by birth weight in girls (β=0.184, p=.022). After adjustment for AHI, WHR in girls was a significant predictor for LOC (β=-0.230, p=.001) and OC (β=-0.177, p=.033) skill scores. For girls, SF was a significant predictor of OC skills when co-varying for factors influencing development (β=-0.183, p<.001). Birth weight, SF, WHR, and BMI were not significant predictors of GMS in boys; however, core strength was a significant predictor of both LOC (β= 0.325, p<.001) and OC (β=0.278, p<.001) skills and the GMQ (β=0.375, p<.001). **CONCLUSION:** In girls, birth weight, WHR, and SF were significant predictors of scores on the constructs of the TGMD-2 suggesting that body composition measures can be used as predictors of gross motor development. Additionally, core strength is a significant predictor of TGMD-2 scores in both boys and girls 3-6 aged years.