Weight Status and Gross Motor Skill in Kindergarten Children

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Purpose: Childhood obesity rates are increasing globally. Physical activity is one behavioral variable that influences weight status. Participation in physical activity requires basic gross motor proficiency in early childhood. The purpose of this study was to examine the relationship between gross motor skill level and weight status in a large national representative sample of kindergarten-aged children.

Methods: Body mass index percentile ranking was calculated for 4650 children from the Early Childhood Longitudinal Study-Birth Cohort. Children were classified into underweight, healthy, overweight, or obese categories according to the Centers for Disease Control and Prevention criteria. The Early Screening Inventory Revised was used to evaluate gross motor skill level. Results: Children with obesity displayed lower gross motor skill levels compared with peers of healthy weight. Largest differences were seen in locomotor and balance skills. Conclusions: Clinicians should consider adjusting gross motor expectations for locomotor or stability tasks in young children with obesity. (Pediatr Phys Ther 2012;24:353–360) Key words: child, female, human, locomotor activities, male, motor skills, obesity

INTRODUCTION AND PURPOSE

More than 30% of children are classified as obese or overweight in the United States, with similar rates in other developed countries around the world. Overall gross motor skills of young children with obesity have been described as delayed or less proficient compared with peers of healthy weight. Yet, the association of obesity with delay in acquisition or decreased proficiency of specific gross motor skills has not been clearly described. Physical therapists working with children of kindergarten age will benefit from a better understanding of the influence of weight status on specific gross motor items when interpreting standardized assessments or planning treatments.

School-aged children classified as overweight or obese demonstrate lower gross motor proficiency compared with peers of healthy weight. Nervik et al recently reported that preschool-aged children classified as overweight or obese scored lower on a standardized gross motor scale compared with peers who were not overweight, though the number of subjects in higher body mass index (BMI) categories in that study were small. Graf et al also found that first-grade children in obese categories had lower overall gross motor skill levels compared with peers who were of normal weight or overweight. Several studies have examined the influence of weight status on gross motor skill categories including locomotor skills, object manipulation, and dynamic body coordination skills. Most studies have found a negative relationship between weight and locomotor skills in both boys and girls. Similarly, several studies report lower dynamic body coordination in children who are obese. Specific gross motor skill delays were not reported in these studies.

Obesity affects the speed and kinematics of gait and static balance in children, which may influence skill acquisition. The effect of weight status on object manipulation is less clear with many studies showing no association between weight status and object manipulation skills, and others reporting that children with obesity score lower in this category compared with children of healthy weight. Childhood obesity and gross motor skill development are a result of both intrinsic (child) and extrinsic (environmental) factors. The World Health Organization’s