Measuring Fine Motor Skills in Children With Visual Impairments

Visual impairments (VI) influence the development of motor learning, especially in the areas of skill development and movement execution. Identifying delays in motor learning in this population requires that motor-skill assessments be adapted to account for the various needs of those with VI. Fine motor skills in this population tend to be assessed less frequently than gross motor skills; therefore the authors used the ManuVis to assess fine motor skills between children with VI and normal-sighted children and to provide norm reference standards for children with VI. An additional purpose was to determine the test–retest and interrater reliability of the ManuVis. After assessment of 256 children with VI and 162 normal-sighted children, results indicated that those with VI required significantly more time to complete the fine-motor-skill assessments and performance time was slower among the younger children with VI than the older age groups. Results from test–retest and interrater reliability were good and indicated that the ManuVis is a valid and useful method for monitoring the fine-motor-development skills of children with VI.


Quantifying Gait in Down Syndrome

Individuals with Down syndrome have been observed to demonstrate differences in gait patterns compared with typically developing individuals. Currently, three-dimensional gait analysis is the method used to assess gait in a clinical setting due to the rich information it provides. However, this method is complicated and results can be difficult to interpret. The current study assessed the suitability of a new methodology, calculating gait profile score (GPS) and gait variable score (GVS), to determine gait deviation in individuals with Down syndrome. Twenty-four individuals with Down syndrome and 15 typically developing individuals participated in the study and were assessed using three-dimensional gait analysis. GPS and GVS scores were then calculated, and results indicated that the group with Down syndrome was significantly different from the control group. The GPS score identified deviations in gait between the two groups, and GVS scores identified significant differences in lower-limb movements. The method of calculating GPS and GVS scores appears to provide a valid summary measure of gait in this population.

Heart-Rate Measurement and Stereotyped Behavior

Stereotypic motor behaviors are commonly observed in individuals with autism spectrum disorders (ASD). It has been hypothesized that these behaviors arise from either over- or underarousal, influencing the individual to self-stimulate in order to return to a level of homeostasis. The current study aimed to build on existing literature of stereotypy in individuals with ASD by determining if there are specific heart-rate patterns associated with these movements and to explore how mood during stereotypic behaviors influenced heart rate. Stereotypic behaviors were operationally defined prior to beginning the study, and these behaviors were directly observed in seven children with ASD. Heart rate was assessed using a Polar heart-rate monitor worn at the chest and paired with an accompanying wristwatch that stored heart-rate data. Results indicated that there was little association between heart rate and stereotypic behaviors in the participating children, but more research is necessary to better understand stereotypy and physiological responses of children with ASD.


Step-Rate Recommendation for Children Who Are Overweight/Obese

The researchers attempted to contribute to the literature of step-rate recommendations for moderate physical activity by examining both resting and walking energy expenditures to determine a more accurate step-rate recommendation for moderate-intensity walking in overweight and obese children. Twenty-three children (14 girls, 9 boys), age 9–12 years participated in the study. All testing was done in a laboratory setting and lasted 18 weeks. Data from anthropometric measures, resting energy expenditure (REE), and walking trials were collected. Mean, intraclass correlation coefficients for the mean, and age-adjusted metabolic equivalents (A-AMETs) were calculated. Results indicated that across the four walking trials (speed variations) there were no differences in the step-rate threshold for overweight versus obese children, and body-mass index and age were positively related to A-AMETs. REE, along with the four walking trials, seemed to be the determining factor in receiving more precise A-AMETs for children, whether healthy or overweight/obese. It is suggested that researchers and practitioners use a range of 100 steps/min (for overweight/obese) up to 140 steps/min (for healthy) as a threshold of children.