

Effect of Balance Bike Training on Balance in Children with Intellectual and Developmental Disabilities

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Background

Children with intellectual (ID) and developmental disabilities (DD) have impaired balance compared to typically developing children and are slower to achieve gross motor milestones. They especially have difficulty when task complexity increases, resulting in a majority of persons with ID/DD not able to ride a two-wheel bike. Cycling is not only a way to be physically active, it can be a source of socialization, relaxation, and transportation. By being unable to ride a bike, persons with ID/DD may have limited opportunities to participate in social and recreational outings that promote physical activity.

Balance Bikes

Delays in developing dynamic balance contribute to the inability of persons with ID/DD to learn to ride a two-wheel bike. Balance bikes have emerged as an effective tool for teaching young children to ride without using training wheels. Once balancing is achieved, pedaling quickly follows. For children with ID/DD, improvement in balance alone can be important for daily life skills. Balance bike training (BBT) may therefore be effective for 1) teaching children to ride a two-wheel bike, 2) improving balance in children with ID/DD, 3) improving socialization and inclusion with peers. Achievements realized through BBT may also influence attitudes and expectations of parents/guardians of children with ID/DD.

Hypothesis

Children with ID/DD will demonstrate balance on the Pediatric Balance Scale (PBS) after 8-weeks of BBT. Parents/guardians of children who receive BBT will have improved perceptions of their child's abilities, as measured by a pre-post BBT survey

Subjects

Participants were recruited from Special Olympics New Jersey Young Athletes programs and identified by their parent/guardian as having an ID/DD diagnosis. Twenty-four children with ID/DD, ages 5-9 years old (16 males and 8 females), participated in the study. None of the children had previous experience learning to ride a bike.



Methods

Participants were fitted with a balance bike (BB) and helmet. A PT experienced in BB led 2 rounds of BBT sessions.

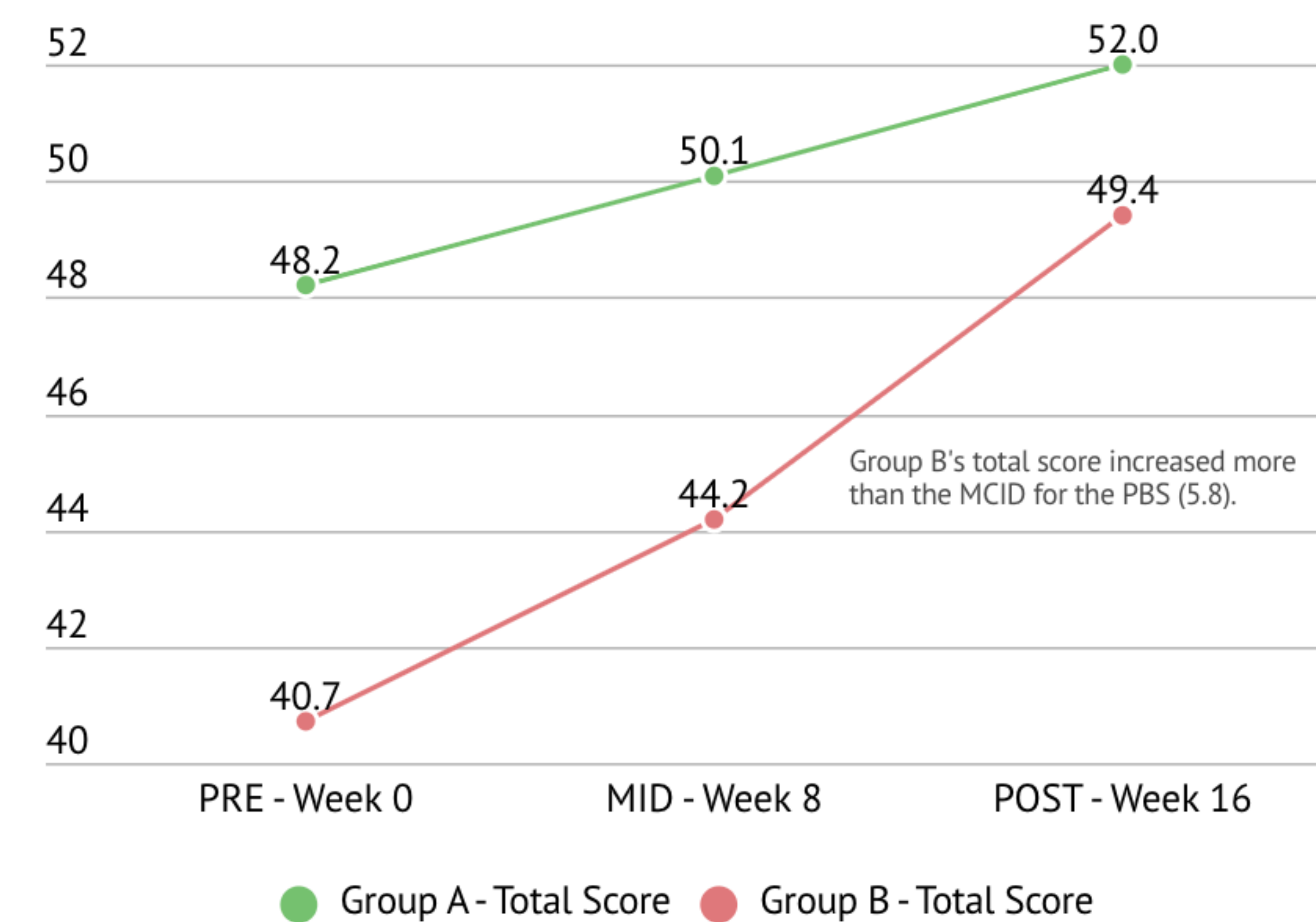
BBT group: one 45-minute BBT session/wk; encouraged to practice at home x 8 weeks. Participants continued to ride their BB at home for 8 more weeks.

Wait-list control group: no intervention.

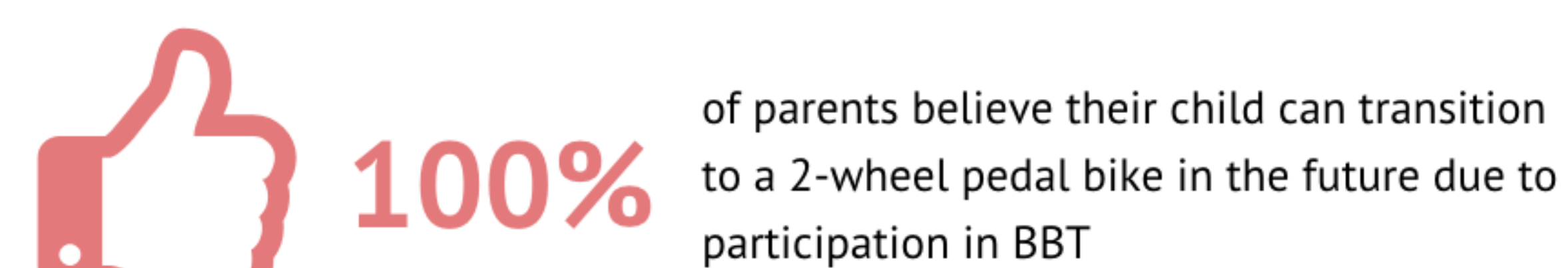
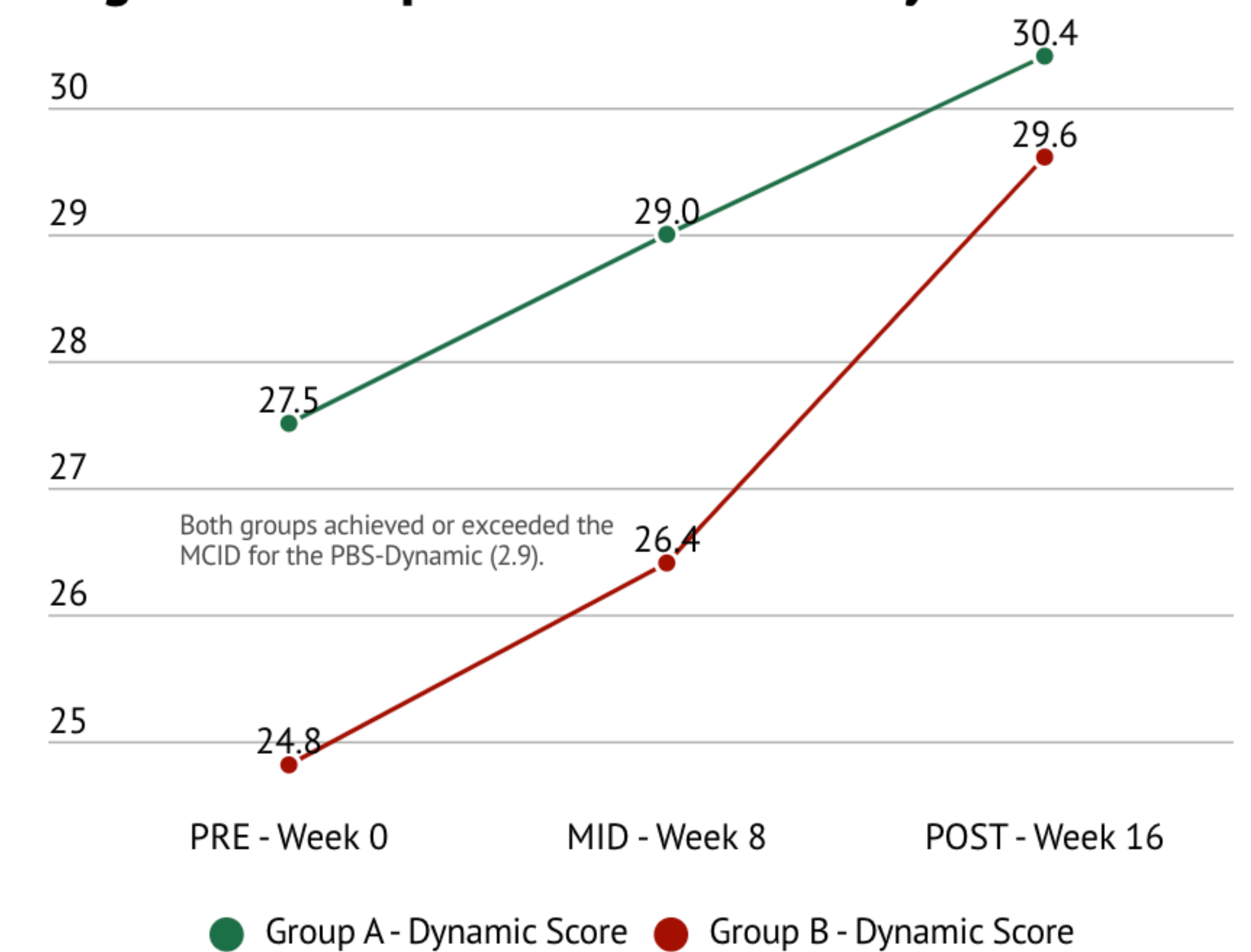
A blinded experienced pediatric PT conducted the PBS at all time points for all groups. Parents/guardians completed a survey about attitudes and their child's balance.

Results

Significant Improvement in PBS Total Scores



Significant Improvement in PBS Dynamic Scores



Conclusions

Compared to the mean baseline PBS scores, children who participated in BBT demonstrated significantly higher total PBS scores. One group's improvement surpassed the tool's minimal clinical important difference (MCID)*.

Pre- and post- mean scores on the dynamic components of the PBS also reveal significant gains with both groups either meeting or exceeding the MCID*.

Pre- and post- parental surveys indicate an increase in parent/guardian perceptions of their child's balance capabilities across the BBT groups.

Clinical Relevance

Therapists, parents and recreation professionals may be able to use BBT as a way to improve balance in children with ID/DD. This may also lead to the promotion of 1) physical activity, 2) socialization and inclusion, and 3) opportunities for training and competition.

Selected References

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