Psychometric Properties of Segmental Assessment of Trunk Control in Infants and Toddlers with Down Syndrome

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PSYCHOMETRIC PROPERTIES OF SEGMENTAL ASSESSMENT OF TRUNK CONTROL IN INFANTS AND TODDLERS WITH DOWN SYNDROME

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PURPOSE

The purpose of this study was to investigate infants and toddlers with Down Syndrome (DS) to determine:

1. interrater, intrarater, and live versus video reliability of the Segmental Assessment of Trunk Control (SATCo)
2. concurrent validity of the SATCo with the Gross Motor Function Measure (GMFM), and
3. whether a model of staggered entry with age and SATCo score predicts GMFM score.

PARTICIPANTS

- 18 children with DS between 6 to 23 months participated
- Mean age = 13.67 months, SD = 5.31

METHODS

- SATCo assesses 7 discrete levels of trunk control in children with neuromotor disabilities.
- At each level, the child is tested on static, active, and reactive trunk control for a possible total score of 20.
- The GMFM measures gross motor function in children with cerebral palsy and DS (under 6 years old).
- Child is scored across 5 dimensions of functional movement.
- Each participant was tested and scored the SATCo videos.
- The authors would like to thank the children and families who participated in this study.
- Three PT raters who had no prior experience with the SATCo were able to administer and score this outcome measure in infants and toddlers with DS.
- A third PT rater, who did not perform live testing sessions, also scored the SATCo videos.

RESULTS - RELIABILITY

Table 1. Reliability of the SATCo Using ICC (2,1)

<table>
<thead>
<tr>
<th>Level</th>
<th>Static ICC (2,1) (95%CI)</th>
<th>Active ICC (2,1) (95%CI)</th>
<th>Reactive ICC (2,1) (95%CI)</th>
<th>Total Score ICC (2,1) (95%CI)</th>
<th>SATCo Level ICC (2,1) (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rater 1 video</td>
<td>0.647 [0.570,0.725]</td>
<td>0.544 [0.418,0.681]</td>
<td>0.666 [0.386,0.870]</td>
<td>0.635 [0.254,0.858]</td>
<td>0.615 [0.241,0.836]</td>
</tr>
<tr>
<td>Rater 2 video</td>
<td>0.812 [0.647,0.943]</td>
<td>0.747 [0.641,0.857]</td>
<td>0.784 [0.651,0.913]</td>
<td>0.806 [0.554,0.923]</td>
<td>0.688 [0.336,0.870]</td>
</tr>
<tr>
<td>Rater 3 video</td>
<td>0.819 [0.662,0.945]</td>
<td>0.798 [0.732,0.866]</td>
<td>0.806 [0.668,0.945]</td>
<td>0.806 [0.554,0.923]</td>
<td>0.606 [0.294,0.858]</td>
</tr>
</tbody>
</table>

RESULTS – CONCURRENT VALIDITY

Table 2. Spearman’s Rho Correlations (r)

<table>
<thead>
<tr>
<th>SATCo</th>
<th>GMFM</th>
<th>SATCo</th>
<th>SATCo</th>
<th>SATCo</th>
<th>SATCo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static Score</td>
<td>0.781</td>
<td>0.803</td>
<td>0.834</td>
<td>0.821</td>
<td>0.834</td>
</tr>
<tr>
<td>Active Score</td>
<td>0.846</td>
<td>0.913</td>
<td>0.941</td>
<td>0.919</td>
<td>0.887</td>
</tr>
<tr>
<td>Reactive Score</td>
<td>0.846</td>
<td>0.913</td>
<td>0.941</td>
<td>0.919</td>
<td>0.887</td>
</tr>
<tr>
<td>Total Score</td>
<td>0.788</td>
<td>0.832</td>
<td>0.821</td>
<td>0.829</td>
<td>0.821</td>
</tr>
</tbody>
</table>

GMFM = Gross Motor Function Measure (Russell et al 2000)
SATCo = Segmental Assessment of Trunk Control (Butler et al 2010)

RESULTS – CONSTRUCT VALIDITY

- Age accounted for 63% of the variation in GMFM total score and SATCo total score accounted for an additional 17%.
- There was a significant regression equation (F(2,15) = 30.45, p < 0.001).
- Block entry of the single predictors of age (R = 0.82, R² = 0.67, F(1,16) = 31.89, p < 0.001) and SATCo total score (R = 0.86, R² = 0.74, F(1,16) = 46.599, p < 0.001) had a significant predictive effect on dimension B (sitting) of the GMFM.

CONCLUSIONS

- Three PT raters who had no prior experience with the SATCo were able to administer and score this outcome measure in infants and toddlers with DS.
- Trunk control appears to play a central role in the gross motor function of infants and toddlers with DS. The SATCo was found to have good psychometric properties in infants and toddlers with DS.

CLINICAL RELEVANCE

- This study contributes to the literature on the psychometric properties of the SATCo and supports its use to measure trunk control in infants and toddlers with DS.

ACKNOWLEDGMENTS

- This study would not have been possible without the dedication of Christie Fryatt, Kelli Croll, and Simran Gutierrez.
- The authors would like to thank the children and families who participated in this study, as well as Jessica Crosby, Abey Oommen, and Adedolapo Adegbeye.
- This study fulfilled part of Megan Flores’ degree requirements for a PhD at TWU.
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References: