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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 video-recorded) on the SATCo by 2 physical therapist (PT) raters at least 30 minutes apart.
- One PT rater also administered GMFM to all participants.
- After 2 weeks, the PT raters re-scored their video-recorded SATCo testing sessions.
- A third PT rater, who did not perform live testing sessions, also scored the SATCo videos.

**RESULTS - RELIABILITY**

<table>
<thead>
<tr>
<th>Table 1. Reliability of the SATCo Using ICC (2,1)</th>
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<tbody>
<tr>
<td><strong>Static ICC (2,1) [95%CI]</strong></td>
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<tr>
<td>Interrater Reliability (Rater 1 vs Rater 2)</td>
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<tr>
<td>Interrater Reliability (Rater 2 live vs Rater 2 video)</td>
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<tr>
<td>Interrater Reliability (Rater 2 video vs Rater 1 video)</td>
</tr>
<tr>
<td>Intrarater Reliability (Rater 1 live vs Rater 1 video)</td>
</tr>
<tr>
<td>Intrarater Reliability (Rater 2 live vs Rater 2 video)</td>
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</tbody>
</table>

**RESULTS – CONCURRENT VALIDITY**

<table>
<thead>
<tr>
<th>Table 2. Spearman’s Rho Correlations (r)</th>
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<tbody>
<tr>
<td><strong>SATCo Static Score</strong></td>
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<tr>
<td>GMFM Dimension B (sitting) Score</td>
</tr>
<tr>
<td>GMFM Total Score</td>
</tr>
</tbody>
</table>

*all values significant at p < 0.001

**REFERENCES**

Russell et al 2000
Butler et al 2010

**ACKNOWLEDGMENTS**

- This study would not have been possible without the dedication of Christie Fryatt, Kelli Cool, and Simran Gutierrez.
- The authors would like to thank the children and families who participated in this study, as well as Jessica Crosby, Abbey Oommen, and Adedolapo Adegboyega.
- This study fulfilled part of Megan Flores’ degree requirements for a PhD at TWU.
- This study was supported by a grant from the Academy of Pediatric Physical Therapy (Mentored Research Grant April 2018)

**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.