Measuring Physical Function in Children with Cerebral Palsy Using the PEDI-CAT: A Validation Analysis

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Background and Purpose

Computer adaptive testing platforms for healthcare application offer an alternative to traditional, fixed-length, paper & pencil instruments. The PEDI-CAT utilizes a computer adaptive platform with an increased item bank of 276 items divided into domains of (1) Daily Activities; (2) Mobility; (3) Social/Cognitive, and (4) Responsibility. The objectives of this study were to test the concurrent validity of the PEDI-CAT (versus the CPCHILD and PEDI accordingly) in a diverse population of children with CP.

Study Design

Prospective Cross-Sectional Convenience Sample (Level II)

Participants & Setting

One hundred and two English and Spanish speaking children/parents with CP were recruited from our tertiary level, multidiscipline children’s clinic between August 2013 and January 2014. Children were excluded if their diagnosis was uncertain or if they had undergone recent surgery (<6months) or botulinum toxin A administration (<3months).

Methods

Age, gender, Gross Motor Function Classification Level (GMFCS), and race were recorded for all participant families. Items from the 4 PEDI-CAT domains (Daily Activities, Mobility, Social Cognitive and Responsibility) were administered to parents via an iPAD. In addition, parents were asked to complete the fixed paper version of the PEDI along with the PedsQL (GMFCS I-III) and CPCHILD (GMFCS IV & V) with the aid of a trained research assistant. Validity was measured using Pearson’s (concurrent validity) and Spearman (convergent validity) correlation coefficients. We hypothesized that high concurrent validity existed between the PEDI-CAT and PEDI and strong convergent validity existed between the PEDI-CAT and PedsQL/CPCHILD.

Results

There were 23 GMFCS I (23%), 19 GMFCS II (19%), 17 GMFCS III (17%), 21 GMFCS IV (21%) and 21 GMFCS V (21%) children included in this study. Mean age was 11.9 years (SD =+3.7).

The PEDI-CAT demonstrated excellent agreement with the PEDI across all domains (p<0.001)
- Mobility ICC = 0.91
- Daily Activities ICC = 0.95
- Social/Cognitive ICC= 0.84

In ambulant children, the Daily Activities (PEDI-CAT) domain exhibited strong correlation with the Daily Activities domain (PedsQL) (r=0.85, p<0.001) and Eating Activities domain (PedsQL)(r=0.76, p<0.001) and with School Activities domain (PedsQL)(r=0.62, p<0.001).

In non-ambulant children, moderate correlations were seen between the Daily Activities, Social/Cognitive and Responsibility domains (PEDI-CAT) and the Health (CPCHILD) domain (r=0.60, 0.60, 0.53 respectively, p<0.001) and between Social Function (PEDI-CAT) domain and Communication (CPCHILD) domain (r=0.64, p<0.001).

Discussion

In summary, this validation analysis has demonstrated that the PEDI-CAT is a reliable and accurate outcome tool, which is available electronically and can be administered across a diverse population of children with Cerebral Palsy. Moving forward we will now begin to study the responsiveness of this instrument over time, relative to natural history and surgical interventions.