

# Service improvement project: Analysis of routine clinical data in paediatric neuropsychological rehabilitation

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## BACKGROUND AND HYPOTHESES

Our community-based service uses measures recommended for research by McCauley et al. (2012). We selected measures to represent levels of a PNDS (Physical, Neuropsychological, Developmental, Systems) framework as described originally by Byard, Fine & Reed, (2011).

These represent key areas of function for the child in a systemic context.

We hypothesise that there will be improvement between assessment and review on a range of measures representing levels of the model.

## PARTICIPANTS

Data collected through routine clinical practice from 159 children with brain injury and their families. Age range 0-18 years, age at injury 0-18 years, traumatic and non-traumatic brain injury, mild to severe.

## METHOD

Individualised neuropsychological rehabilitation delivered to child and family. Outcome questionnaires (PedsQL, BRIEF, SDQ, CASP) routinely collected by associates at assessment (T1) and review (T2). Nonparametric data entered onto a MS Access database. Differences between assessment and review scores analysed with Wilcoxon signed ranks tests using SPSS.

## QUESTIONNAIRE COMPLETION RATES

**Table 1.**

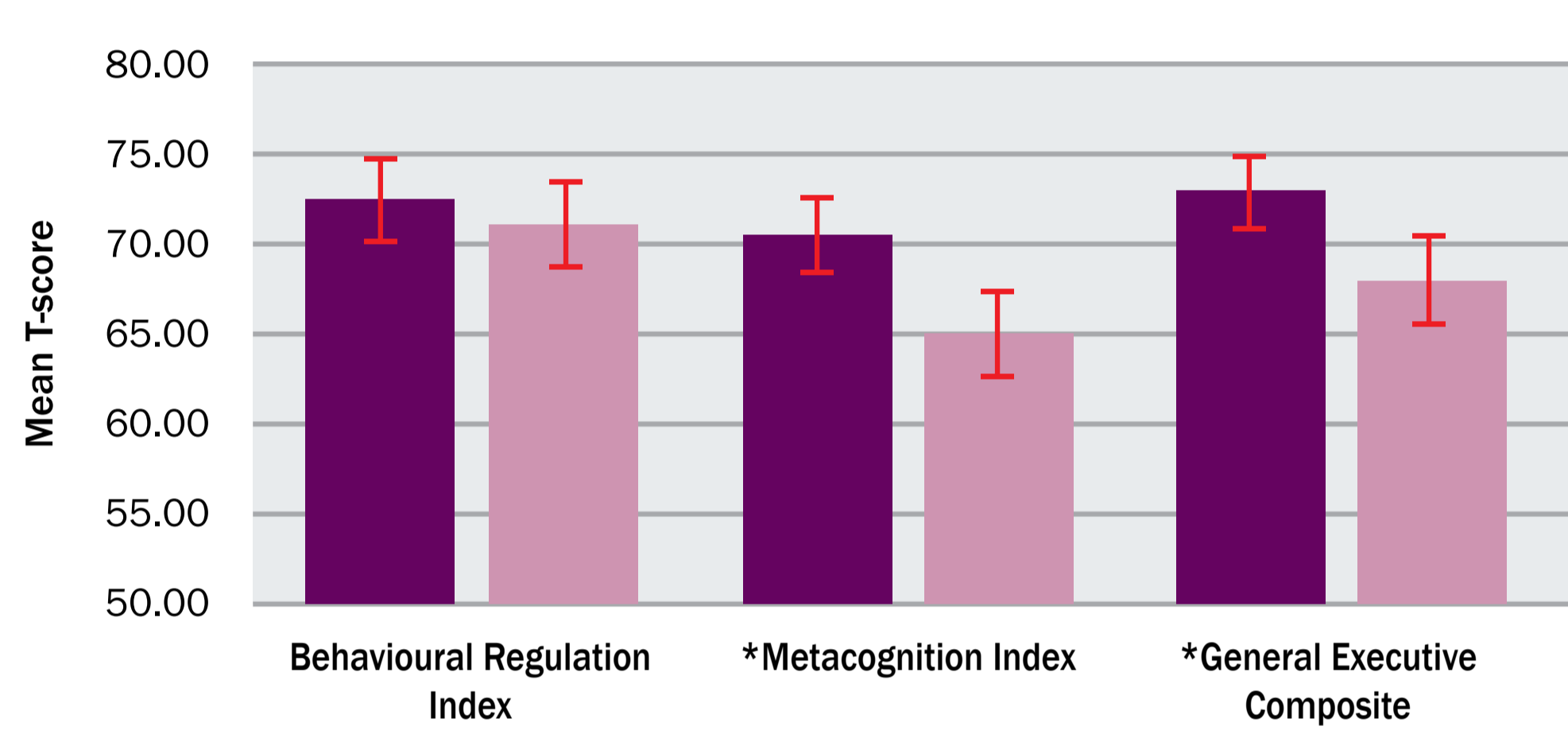
Outcome measure completion at baseline and review.

|                              | N collected at T1 and T2 |
|------------------------------|--------------------------|
| PEDS-QL core parent report   | 29                       |
| PEDS-QL core self-report     | 27                       |
| BRIEF parent report          | 21                       |
| SDQ parent report            | 34                       |
| SDQ self-report              | 14                       |
| CASP                         | 21                       |
| PEDS-QL family impact module | 28                       |

### Change on the Neuropsychological Level

BRIEF parent rated General Executive Composite (n=21; z=-2.877; p=0.004) & Metacognitive Index (n=21; z=-2.841; p=0.004) Behavioural Regulation Index not significant (n=21; z=-0.706; p=0.480)

#### BEHAVIOUR RATING INVENTORY OF EXECUTIVE FUNCTION



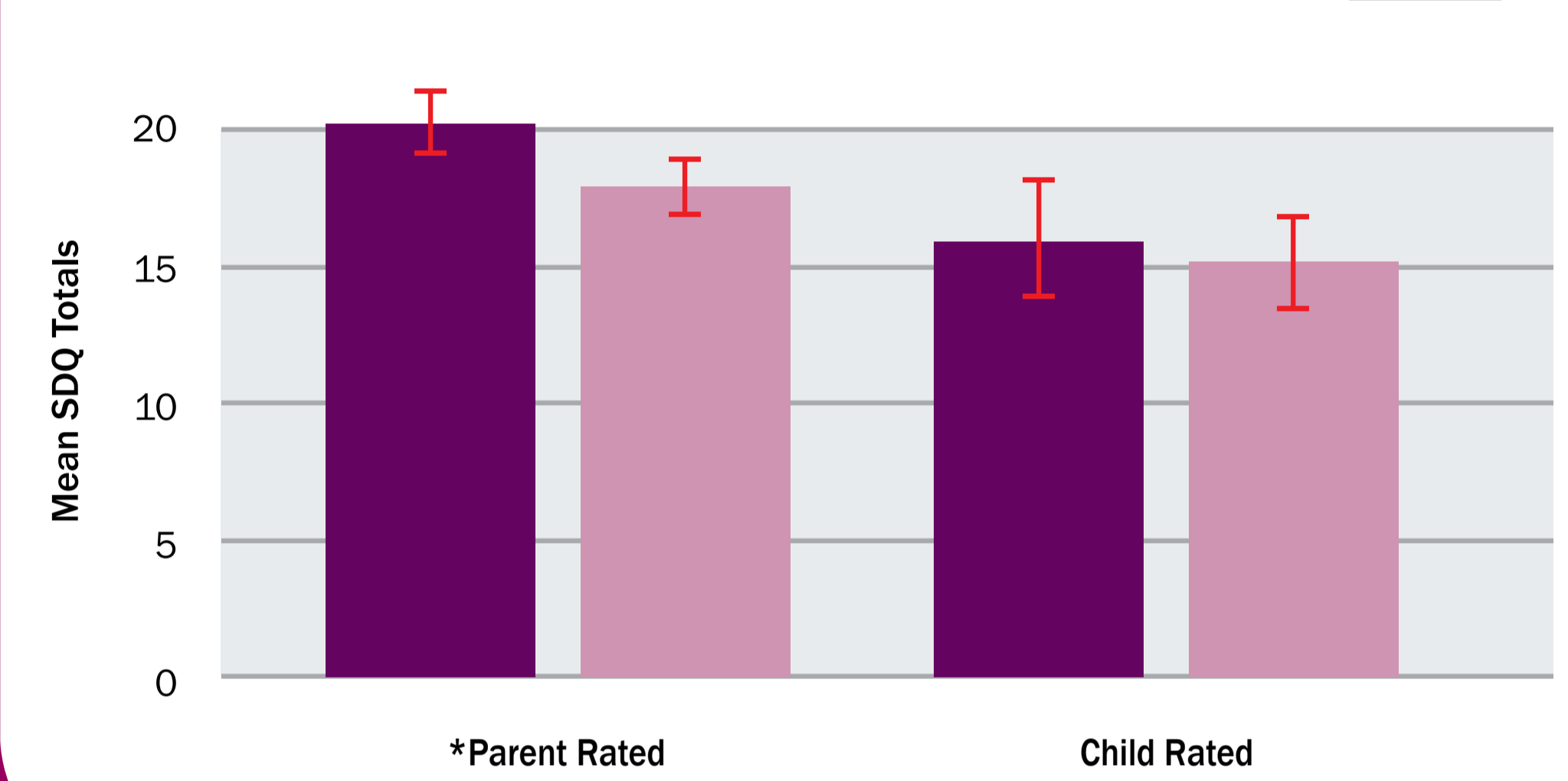
### CHANGES IN REPORTED FUNCTIONING OVER TIME

All questionnaires showed an increase in average scores in a positive direction. Statistical significance is indicated \* on graphs, all tests 2-tailed:

### Change on the Psychological Level

Total SDQ parent rated (n=34; z=-2.376; p=0.017) but child rated not significant (n=14; z=-0.864; p=0.387)

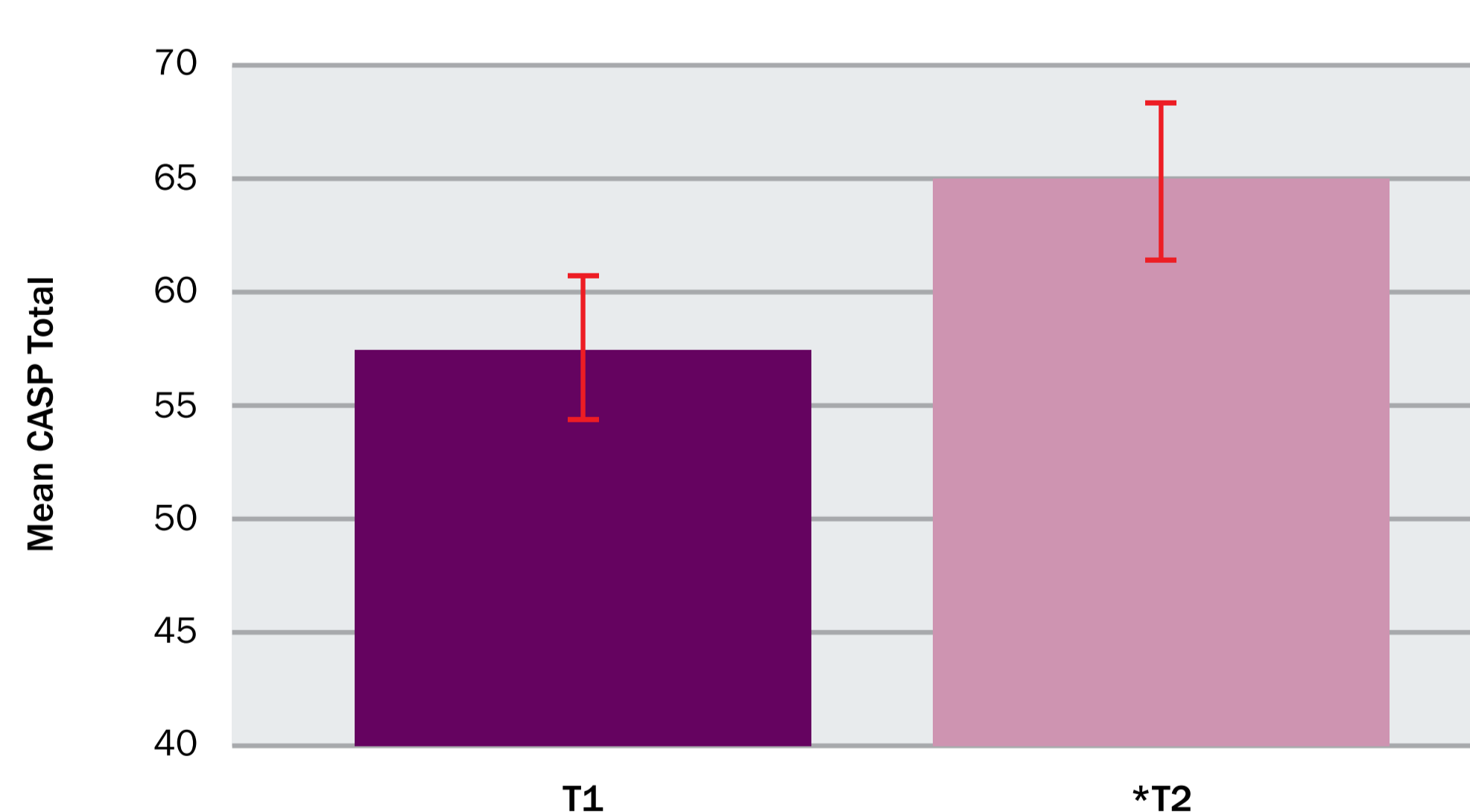
#### STRENGTHS & DIFFICULTIES QUESTIONNAIRE TOTAL



### Change on the Developmental Level

CASP Scale of Participation (n=21; z=-2.103; p=0.035)

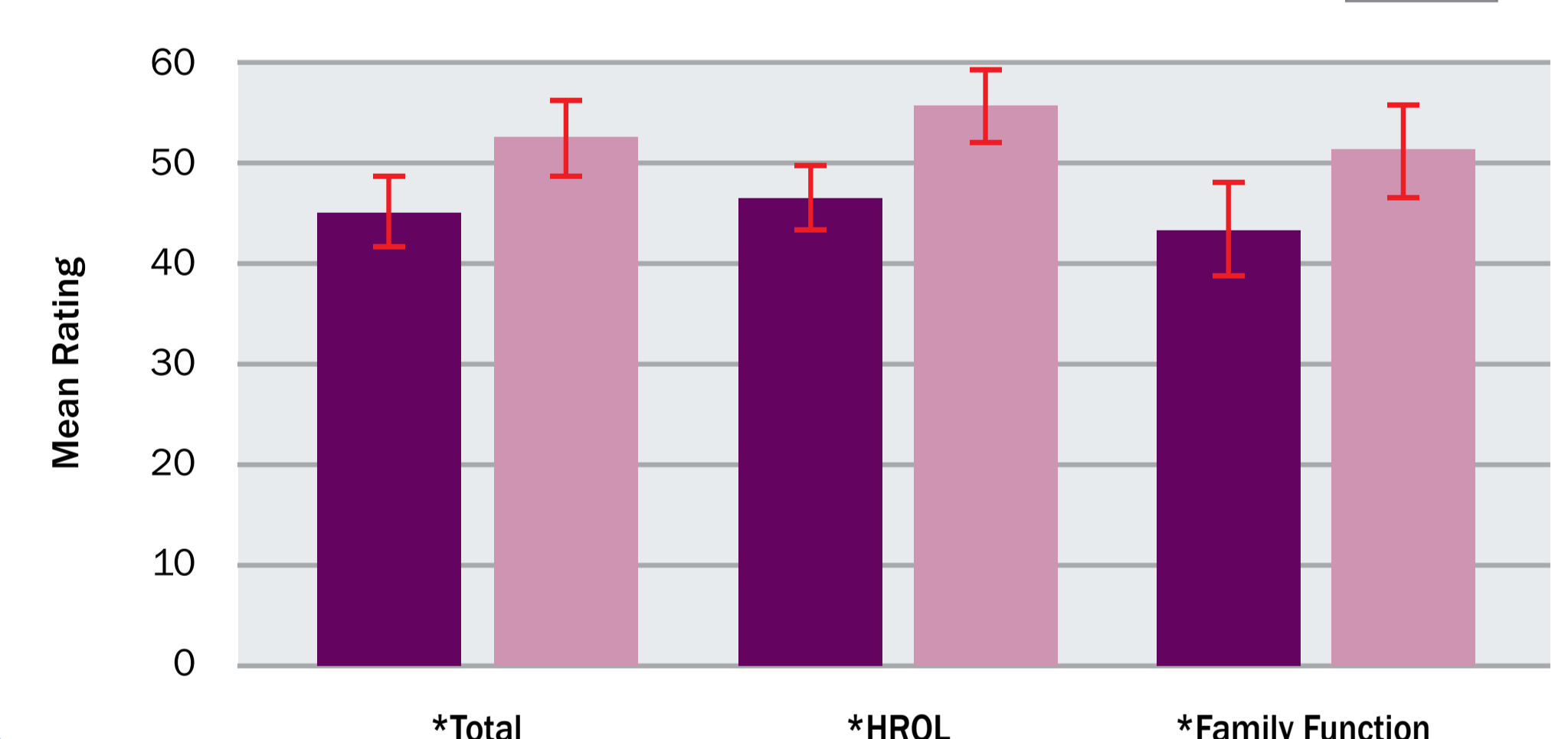
#### CHILD & ADOLESCENT SCALE OF PARTICIPATION



### Change on the Family System Level

PedsQL Family Impact Measure Total (n=28; z=-2.609; p=0.009); HRQL (n=28; z=-2.323; p=0.020); Family Functioning (n=28; z=-2.376; p=0.018)

#### PedsQL FAMILY IMPACT MEASURE



## DISCUSSION

There were gaps in the database, particularly at review. Not all assessments led to intervention.

Outcomes on neuro-psychological, developmental and systemic levels of the PNDS model are encouraging. There was no significant change on measures of physical function.

It is not possible to establish a relationship between intervention and outcome with only questionnaire data. A future database should include standardized and individually tailored measures and represent the child and family's activity and participation.

## RECOMMENDATIONS

- Ensure all clients have baseline data; increase review measure collection
- Increase use of CASP - increased participation is a key developmental aim
- Include goals and intervention data as part of the outcome suite
- Further studies asking: What is being collected? How well? Reasons for gaps? Relationship between outcomes and intervention?

- Outcome measures in paediatric neurorehabilitation should represent physical, neuropsychological, developmental and systemic levels of function
- Ensure focus of measurement is on activity and participation, the main aims of rehab
- Aim for a UKROC style suite used by the clinical community in paediatric neurological rehabilitation.

## References:

- Byard, K., Fine, H. & Reed, J. (2011). Taking a developmental and systemic perspective on neuropsychological rehabilitation with children with brain injury and their families. *Clinical Child Psychology and Psychiatry*, 16 (2), p165-184.
- McCauley, S. R., Wilde, E. A., Anderson, V. A., Bedell, G., Beers, S. R., Campbell, T. F., et al. (2012). Recommendations for the use of common outcome measures in pediatric traumatic brain injury research. *Journal of Neurotrauma*, 2: 678-705.