Cognitive Functioning Following Acute Concussion in the General Population: The Toronto Concussion Study

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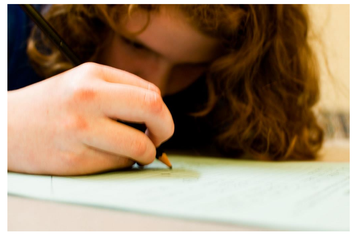
Introduction

- >150,000 residents of Ontario are diagnosed with a concussion yearly[1]
- Symptoms of concussion may include cognitive dysfunction, including fogginess, difficulty concentrating and remembering.[2]



Objectives

To explore the relationship between **subjective cognitive complaints** following acute concussion and **objective neurocognitive measures** using a norms-based approach.

Methods

- Patients at the Hull-Ellis Concussion Clinic (17 - 85 years of age) were invited to engage in a research which includes assessment of cognitive functioning
- All participants completed the SCAT5 Post-Concussion Symptom Scale and objective cognitive measures from the NIH Toolkit within 7, and 14-days of injury
- Objective cognitive measures included:
  - Trails A & B (weeks 1 and 2)
  - Symbol Search and Coding (weeks 1 and 2)
  - Rey-Auditory Verbal Learning (and recall) Task (RAVLT) (week 2)
  - Digit Span (Forwards & Backwards) (week 2)
- Cognitive scores placing at or below the accepted normative cut-point of the 3rd percentile on any measure were classified as 'impaired'

Results

363 adults completed the measures at 'week 1' (females=218, males=145).

265 adults completed the measures at 'week 2' (females=157, males=108).

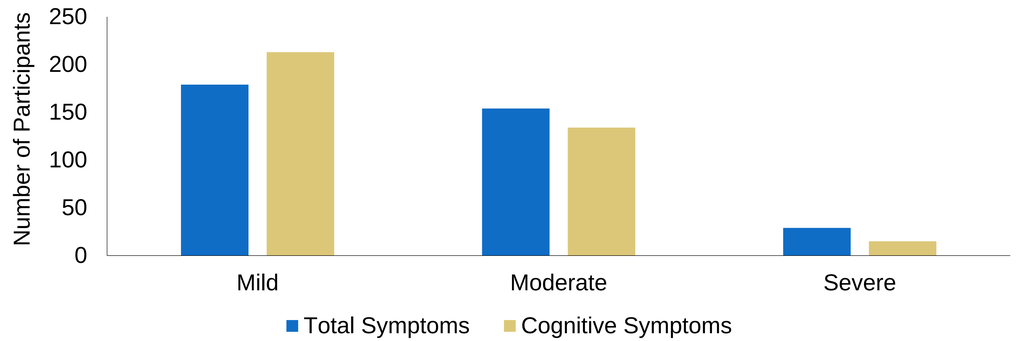


Figure 1: Overall SCAT symptom severity score verses cognitive-specific SCAT items at Week 1.

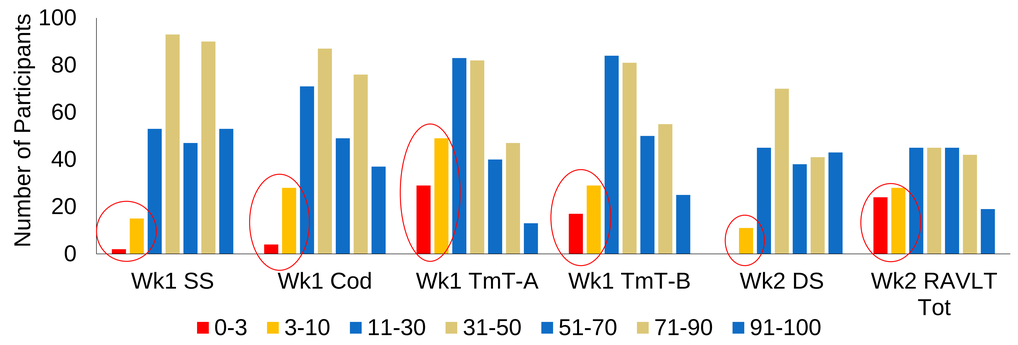


Figure 2: Using the 3rd and 10th percentile as the cut-off to reflect cognitive impairment.

Interestingly, most participants who endorsed 'severe' subjective cognitive disturbance on the SCAT performed better than expected on the various objective measures.

References

1. Langer, L, et al., *JHTR*, **35**(1), E60-E66, 2020. DOI: 10.1097/HTR.0000000000000503
2. Stillman, AM, et al., *J Neurotrauma*, **37**(2), 305-311, 2019. doi.org/10.1089/neu.2018.5925

Although 82% of participants reported having **mild to moderate total symptoms at Week 1**, most reported having **only 'mild' cognitive-specific symptoms**.

Objective cognitive test scores using a norms-based approach were **insensitive** to determine cognitive 'impairment' related to concussion.

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