



# Research Week 2022

## Do Subjective and Objective Measures of Function Change Similarly in People with Persistent Mild Traumatic Brain Injury Symptoms?

Kody R. Campbell, Prokopios Antonellis, and Laurie A. King

campbeko@ohsu.edu

Balance Disorders Laboratory, Department of Neurology, Oregon Health and Science University

### Keywords

mild traumatic brain injury, subjective assessments, objective assessments, concussion, rehabilitation

### Abstract

**Background:** Approximately 10-25% of people diagnosed with a mild traumatic brain injury (mTBI) develop persistent symptoms. Some studies have used subjective assessments to understand changes to mTBI-related impairments weeks after the initial injury. Objective measures of post-mTBI impairments are free from subjective rating bias and can reveal subtle deficits that are tough to detect. **Purpose:** Here, we present changes in both subjective and objective assessments of post-mTBI function in people with subacute mTBI (2-12 weeks post-injury) while waiting for rehabilitation. **Methods:** All included participants had sustained a recent mTBI, were still experiencing symptoms, and had completed a baseline and 6-week follow-up test (n=50). Participants recovered naturally with no intervention from baseline and follow-up tests. At both assessments, participants completed subjective and objective assessments of post-mTBI function. Subjective assessments included questionnaires for mTBI symptoms, headache severity, sleep quality, quality of life, self-perceived percentage of recovery from (0%-100%), and perceived symptom severity provocation during the vestibular/ocular motor screening (VOMS) tool. Objective measures included a computerized neurocognitive assessment and measures of straight-line gait, turning gait, and balance performance calculated from wearable sensors. We calculated effects sizes (ES) on the difference between follow-up and baseline assessments. **Results:** Changes in subject assessments ranged from large improvements (overall mTBI symptoms; ES=0.87) to minimal improvements (quality of life; ES=0.38). There were minimal improvements in objective balance (ES= 0.27), little-to-no changes in neurocognitive function (ES=-0.03), and little-to-no changes in straight-line and turning gait measures (ES's<0.09). **Conclusions:** People recovering naturally from mTBI with no intervention demonstrated minimal to large improvements on subjective assessments but this did not reflect objectively measured function in balance and gait. This work may provide information on changes observed in subjective and objective measures of function during rehabilitation that are beyond the expected change from natural recovery with no intervention.