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Neuropsychological Test Performance in Individuals with Persistent Post-Concussion Symptoms: A Data-Driven Method to Conceptualize OT Cognitive Rehabilitation Toward Return-to-Work

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Introduction

Cognitive deficits, secondary to concussion, can impact return to work; people may be held from work due to symptoms. Common difficulties include trouble learning new tasks, or needing more time to perform job tasks. In 10-20% of cases, symptoms can persist for months, and are more likely to persist one year post-injury. Studies have examined cognitive performance after concussion with mixed results, warranting further research in cognitive deficits and cognitive rehabilitation. The OT scope of practice is inclusive of rehabilitation at the physical, cognitive, and affective domains; however, concussion cognitive rehabilitation services are under-represented in literature.

The purpose of this project is to identify cognitive deficits persisting after concussion to provide treatment recommendations to facilitate return to work. A secondary aim is to make a case for broadening the occupational therapy role on the concussion team.

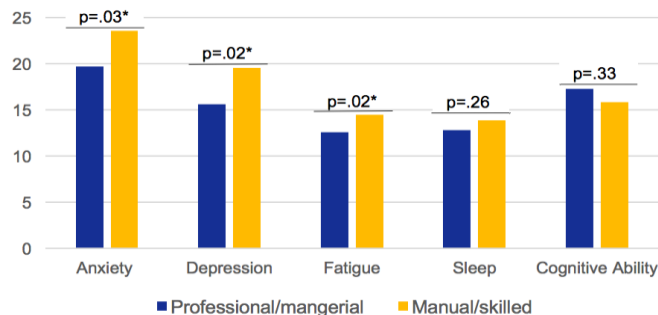
Methods

A retrospective analysis was conducted using a complete battery of neuropsychological assessment results, including measures of executive function, attention, language, memory, and processing speed. Data was collected, de-identified data was exported, and statistically analyzed. Descriptive statistics included means, standard deviations, and 95% confidence intervals. Independent variables were gender, age, loss of consciousness or post-traumatic amnesia, injury setting, work status, and job type.

Results

Variables	Measures	Significance	Cognition Process
Gender	HVLT, Total learning	p=.03	Verbal learning
	HVLT, Delay	p=.003	Verbal learning
	BVMT, Total learning	p=.03	Visual memory
	BVMT, Delay	p=.03	Visual memory
	DKEFS, Category switching	p<.001	Verbal fluency
	DKEFS, Category fluency & category switching	p=.001	Verbal fluency
Age	WAIS, Digits forward	r=.318, p=.006	Complex attention
	DKEFS, Stroop word	r=.272, p=.021	Executive function
	DKEFS, Stroop cognitive switching	r=.314, p=.008	Executive function
	RBANS, Picture naming	r=.302, p=.049	Language
LOC/PTA	PROMIS, Anxiety	p=.02	Self-report
Injury Setting	DKEFS, Category switching	p=.01	Verbal fluency
	DKEFS, Category fluency & category switching	p=.04	Verbal fluency
Work Status	DKEFS, Inhibition vs color naming	p=.004	Executive function
	DKEFS, Stroop I/S vs R/N	p=.013	Executive function
Job Type	DKEFS, Stroop color	p=.04	Executive function

Patient-Reported Outcomes Measurement System



Conclusion

Results of this study suggest that cognitive and affective symptoms may hinder the return to work process after concussion. The findings demonstrate different manifestations of symptoms and deficits based on demographics, mechanism of injury, injury setting, work status, and job type. The differences amongst patients makes occupational therapists uniquely qualified providers of cognitive rehabilitation for RTW based on knowledge of activity analysis and core constructs of occupation which allow for individualized treatment development, specific to job type and workplace demands.

Implications for OT Practice

Occupational therapists can use neuropsychological test results to guide cognitive rehabilitation treatment development to facilitate return to work. Main cognitive domains of focus are verbal learning, verbal fluency, and executive function. OT's can provide remediation and compensatory treatments, as well as suggest workplace environmental modifications to reduce barriers to participation.

Occupational therapists should be cautious of work status and job type, accounting for needed rest breaks. Manual/skilled workers may be more anxious; OTs can guide patients through relaxation strategies, including deep breathing exercises or guided imagery.

See provided reference list.