Changes in Self-Efficacy and Perceptual-Cognitive Performance Following Mild Traumatic Brain Injury in Varsity Athletes

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INTRODUCTION

The diagnosis and monitoring of mild traumatic brain injury (mTBI) remain a challenge for healthcare professionals. Currently, there is a lack of consistent recommendations in the literature on mTBI-specific tests. Previous studies report that this injury may alter self-efficacy and perceptual-cognitive performance, which have been identified as potential avenues for mTBI identification and management.

The aim of this study was to examine the effect of sustaining an mTBI on varsity athletes' self-efficacy and perceptual-cognitive performance by comparing preseason values with acute post-injury and return-to-play assessments.

METHODS

Preseason baseline (PS)

159 university varsity athletes

NeuroTracker

Self-efficacy questionnaire

mTBI diagnosis

Post-mTBI phase

20 athletes

48-72 hour post-injury (Acute phase: AP)

3 follow-up visits

Return-to-Play (RTP)

RESULTS

Table 1: Participants' demographic information

Participants (n=)	Age (years)	Sports (n=)	Days between mTBI and AP	Days between mTBI and RTP
Women = 9	23 ± 1.41	Cheerleading = 3 Volleyball = 2 Soccer = 4	2.5 ± 1.87	16 ± 1.73
Men = 11	23.45 ± 2.16	Cheerleading = 1 Soccer = 3 Hockey = 7	3.78 ± 1.56	14.33 ± 3.21
Overall = 20	23.25 ± 1.83	Cheerleading = 4 Soccer = 7 Hockey = 7 Volleyball = 2	3.27 ± 1.75	15.17 ± 2.48

Table 2: Self-efficacy questionnaire scores and NeuroTracker performances comparisons between PS, AP and RTP

	Self-efficacy Questionnaire				Neurotracker	
	Athletic skills		Physical activity			
	$\bar{x} \pm SD$		$\bar{x} \pm SD$		$\bar{x} \pm SD$	
Preseason	887.06 ± 87.73		731.76 ± 67.38		1.19 ± 0.26	
Acute phase	662.63 ± 211.58		518.89 ± 166.13		1.13 ± 0.28	
RTP	788.89 ± 168.26		677.78 ± 75.30		1.41 ± 0.28	
	Z	***p***	**Z**	***p***	**Z**	***p***
AP vs PS	-3.10	**0.00***	-3.15	**0.00***	-1.25	0.21
RTP vs PS	-2.21	**0.03***	-2.53	**0.01***	-1.54	0.12
RTP vs AP	-2.52	**0.01***	-2.67	**0.01***	-2.52	**0.01***

Figure 1: Self-efficacy questionnaire scores comparisons between PS, AP and RTP

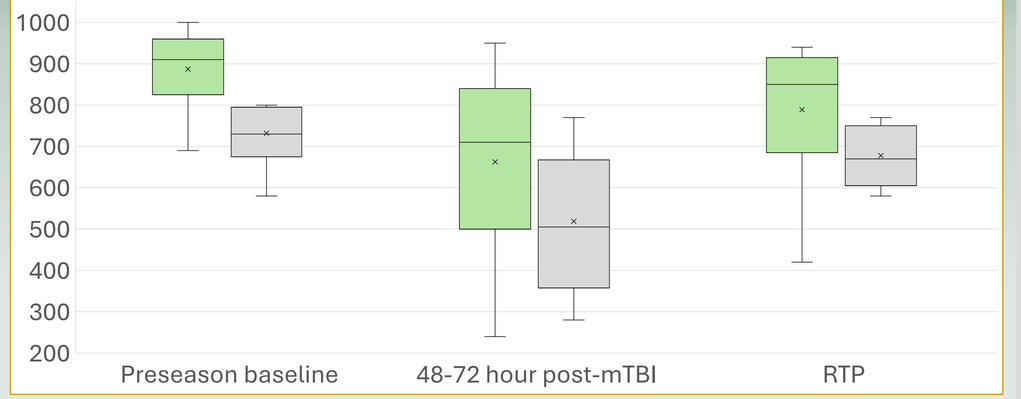
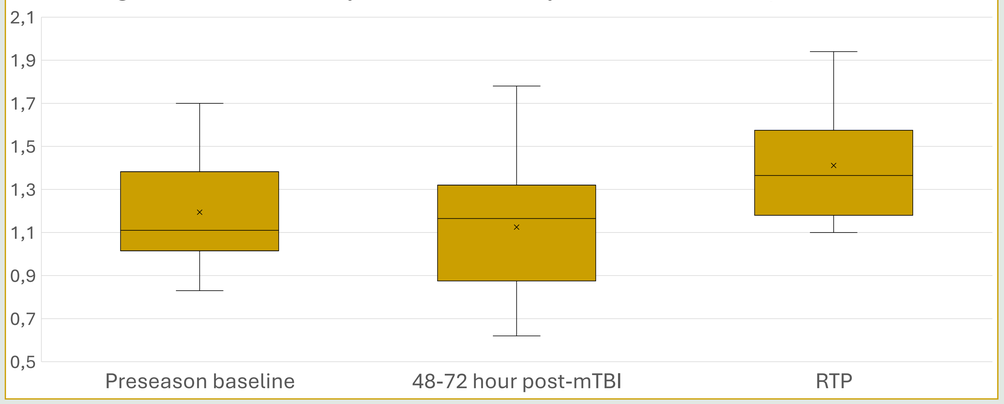


Figure 2: NeuroTracker performances comparisons between PS, AP and RTP



CONCLUSION

This study showed that **athletes' self-efficacy** related to athletic skills and physical activity **significantly decreased following an mTBI** during the **acute phase** and increased at RTP, but **did not return to PS levels**. Self-efficacy should therefore be included in the clinical assessment and management of mTBI, and further research is warranted to better understand and accurately capture these changes

Nevertheless, the results indicate that **NeuroTracker performance does not appear to be directly impacted by mTBI**. However, the **learning gains of this perceptual-cognitive task** seem to be altered by mTBI and **to normalize after repeated exposure** to the NeuroTracker.

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