

## Subjective Cognitive Workload is Higher During a Sustained Visual Search Task in Individuals with a Mild Traumatic Brain Injury Compared to Controls

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*Received Aug. 21, 2024; Accepted for publication Aug. 26, 2024; Published online Aug. 27, 2024*

<https://doi.org/10.17161/kjmv.voll7.22737>

**Introduction.** Persistent symptoms after a mild traumatic brain injury (mTBI) are associated with reduced activity and reports of mental fatigue. Our aim was to compare objective and subjective cognitive workload during a sustained visual task between people with persistent symptoms after a mTBI and controls.

**Methods.** The Dot Cancellation Task, a sustained visual search task, was completed and change in pupil diameter during the task was collected and converted to the Index of Cognitive Activity (ICA). Subjective cognitive workload was collected through the NASA-TLX Questionnaire. Patient reported outcomes included the Post-Concussion Symptom Scale (PCSS) and the Mental Fatigue Scale (MFS).

**Results.** Fifty-two subjects, 27 with mTBI ( $29.59 \pm 23.1$  weeks post injury; aged  $56.78 \pm 10.2$ ) and 25 controls (aged  $55.52 \pm 8.9$ ), participated in the study. Individuals with mTBI took  $536.6 \pm 9.93$  seconds to complete the Dot Cancellation Task, while controls took  $437.2 \pm 6.2$  seconds ( $p = 0.002$ ). The ICA was not different between groups for the right eye ( $p = 0.74$ ) or left eye ( $p = 0.71$ ). The average NASA-TLX score for mTBI participants was  $35.43 \pm 18.31$  while the average for controls was  $14.53 \pm 12.65$  ( $p < 0.001$ ). The NASA-TLX score correlated moderately with both the PCSS ( $\rho = 0.57$ ) and the MFS ( $\rho = 0.59$ ).

**Conclusions.** Individuals with persistent symptoms following a mTBI take longer to complete a sustained visual task, report higher cognitive workload, higher symptom burden, and higher mental fatigue compared to controls despite no difference in objective measures of cognitive workload. Interventions to reduce symptoms that persist after a mTBI are essential.

*Acknowledgements: Kansas University Training Program in Neurological and Rehabilitation Sciences (NIH T32 award) supported by NIH Award Number T32HD057850.*