

## Comparison of Driving Simulator and Visuo-Cognitive Test Performance between CDL and Non-CDL Drivers

Adam Wilson, B.S.<sup>1</sup>, Sadie Revell, B.S.<sup>1</sup>, Shelley B. Bhattacharya, D.O., MPH<sup>2</sup>, Liam Lynch, B.S.<sup>1</sup>, Samuel Durairaj, MPT<sup>3</sup>, Nidhi Patel, M.D.<sup>1</sup>, Hannes Devos, Ph.D., DRS<sup>3</sup>, Abiodun Akinwuntan, Ph.D., MPH, MBA<sup>3</sup>

<sup>1</sup>University of Kansas School of Medicine-Kansas City, Kansas City, KS

<sup>2</sup>University of Kansas School of Medicine, Kansas City, KS, Department of Family Medicine, Division of Geriatric Medicine

<sup>3</sup>University of Kansas School of Health Professions, Kansas City, KS, Department of Physical Therapy, Rehabilitation Science, and Athletic Training

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

*<https://doi.org/10.17161/kjmvoll7.22720>*

**Introduction.** This cross-sectional study investigated driving simulator and visuo-cognitive test performance in commercial driver license (CDL) participants and non-CDL participants to examine what differences exist between the two populations.

**Methods.** CDL participant performance data was acquired from a separate longitudinal study that examined factors predicting CDL simulator performance. Non-CDL participants were recruited through printed flyers, an online website, and word of mouth. The performance of 31 CDL participants (average age  $52.58 \pm 12.20$ , 28 men (90.3%)) and 25 non-CDL participants (average age  $48.36 \pm 21.90$ , 11 men (44.0%)) were analyzed. The assessed parameters included demographics, visuo-cognitive testing, and simulator performance.

**Results.** Demographic analysis via independent t-tests demonstrated that CDL drivers had significantly higher BMI and increased annual driving mileage, yet no significant difference in prescription medications. Analysis of cognitive variables via independent t-test showed statistically significant lower scores in MoCA ( $p = 0.001$ ) and Dot cancellation ( $p = 0.02$ ) when compared to non-CDL drivers. Analysis of driving performance demonstrated significantly higher brake reaction time ( $p = 0.042$ ), less off-road accidents ( $p < 0.001$ ), and less road edge excursions in the CDL population.

**Conclusions.** Overall, when compared to the general population, CDL drivers exhibited better driving performance, despite decreased cognitive test parameters. Based on the results, future research should investigate any causal links that could explain the statistically significant difference in reaction times between non-CDL and CDL drivers. Additional research should also examine potential undertreatment of comorbidities within the CDL population.

*The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the information presented herein. This document is disseminated in the interest of information exchange. The study is funded, partially or entirely, by a grant from the U.S. Department of Transportation's University Transportation Centers Program. However, the U.S. Government assumes no liability for the contents or use thereof.*

Copyright © 2024 Wilson, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial No Derivatives (by-nc-nd) License. (CC-BY-NC-ND 4.0: <https://creativecommons.org/licenses/by-nc-nd/4.0/>)