Letter to the Editor

Commentary on "A Study of Visual Function Quality Along with Static and Dynamic Visual Acuity in Commercial Bus Drivers of Chandigarh, Mohali, and Panchkula"

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Sachitanand Singh[1], Ashith Tripathi[2], Iqra Jammal Khan[3]
[1-3]Department of Optometry, UIAHS, Chandigarh University, Mohali, Punjab, India

Dear Editor,

I read with great interest the article by Sharma et al, investigating static and dynamic visual acuity (SVA and DVA) among professional bus drivers in the Tricity region of India.[1] The study adds valuable insight into occupational vision health, yet some gaps and methodological limitations merit discussion.

First, while the cross-sectional design provides a snapshot of visual skills, it does not establish causal relationships between visual functions and driving performance. A longitudinal or interventional design could more effectively assess whether deficits in DVA or contrast sensitivity directly contribute to increased accident risk, as highlighted in previous systematic reviews linking vision impairment with crash likelihood.[2]

Second, the exclusion of night-time drivers and those with subnormal vision (>±3.00 D or BCVA <6/6) potentially limits generalizability. Given that disability glare and poor night vision are critical contributors to commercial driving safety (Boadi-Kusi et al, 2021), future studies should integrate night-driving assessments and include drivers with varying refractive statuses.[3] This would yield a more representative picture of occupational visual challenges.

Third, although the Visual Activities Questionnaire (VAQ) was employed, the reliance on self-reported outcomes may have introduced response bias. Objective measures such as driving simulator tests or hazard perception tasks, shown to correlate strongly with real-world driving safety, could strengthen the ecological validity of the findings.[4]

The results of this study demonstrated significant differences between SVA and DVA, with DVA evaluation requiring less time, and moderate correlations between visual acuity, stereopsis, and contrast sensitivity. However, the lack of association with colour vision raises questions, as other evidence shows color discrimination deficits may impair recognition of traffic signals.[5] This discrepancy highlights the need for standardized dynamic testing protocols across studies.

In terms of future directions, methodological improvements could include:

- Expanding the sample to older drivers (>45 years) to capture age-related decline.
- Incorporating night-driving and glare testing for ecological validity.
- Employing longitudinal monitoring of accident records to validate the predictive value of visual function tests.
- Using advanced DVA assessments integrated with motion perception paradigms to simulate real-world driving conditions.[6]

In conclusion, while Sharma et al, contribute to the growing field of occupational vision research, expanding methodological approaches and diversifying participant inclusion would enhance the robustness and applicability of their findings.

Correspondence: Ashith Tripathi
Department of Optometry, UIAHS, Chandigarh University, Mohali, Punjab, India
Email: ashithtripathi1200@gmail.com

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Authors Designation and Contribution

Sachitanand Singh; Assistant Professor: *Concepts, Design, Literature Search, Data Acquisition, Data Analysis, Manuscript Preparation, Manuscript Review.*

Ashith Tripathi; Assistant Professor: *Design, Literature Search, Statistical Analysis, Manuscript Editing, Manuscript Review.*

Iqra Jammal Khan; Assistant Professor: *Design, Literature Search, Manuscript Preparation, Manuscript Review.*

Reply to The Letter to The Editor By The Author

Thank you for the thoughtful remark on our recent study. We appreciate these constructive suggestions, which highlight important methodological and conceptual considerations in occupational vision research. Below, we address each point raised:

1. **Study Design:** We acknowledge some limitations of our cross-sectional design in visual deficits and driving outcomes. While a longitudinal or interventional design would indeed provide stronger evidence of causation, our aim was to establish baseline associations between the quality of visual skill and visual quality (Static & Dynamic) among the professional drivers. We agree that future studies should incorporate longitudinal tracking of accident records to better assess predictive validity, as suggested.
2. **Exclusion Criteria and Generalizability:** The exclusion of night-time drivers and those with significant refractive error (>±3.00 D) or subnormal visual acuity was intended to control for extreme vision impairment and focus on functionally eligible drivers under standard licensing criteria in India. However, we recognize that this limits the generalizability to drivers operating under low-light conditions or those with moderate uncorrected refractive errors. Future work should indeed include night-driving assessments and a broader range of refractive profiles, as recommended.
3. **Visual Activities Questionnaire (VAQ):** The use of the Visual Activities Questionnaire (VAQ) was intended to capture subjective visual functioning in daily tasks. We agree that objective measures such as driving simulators or hazard perception tasks would enhance ecological validity. In resource-limited settings, however, such tools are not always accessible. We support the integration of performance-based assessments where feasible and encourage their adoption in future occupational vision studies.
4. **Color Vision and Dynamic vision:** The lack of association between color vision and driving-related visual outcomes may reflect the relatively low prevalence of color vision deficits among licensed commercial drivers, who were screened in this research. Nonetheless, we agree that standardized dynamic visual evaluation, including motion perception and real-world simulation are needed to better evaluate functional vision in driving contexts.

Future Directions: We fully endorse the proposed future directions, including:

- Expanding the sample to include older drivers to examine age-related visual decline.
- Incorporating glare sensitivity and night-vision testing.
- Longitudinal follow-up for accident correlation.
- Advanced dynamic visual acuity paradigms with motion integration.

We are thankful for the insightfulness given and agree that methodological expansion and more inclusive sampling will strengthen the relevance and

impact on the future aspects and look forward to contributing further to this important area of public health and road safety.

Navneet Sharma

Chandigarh Group of Colleges, Jhanjeri, Mohali, Punjab, India.

Email: optom.navneetsharma@gmail.com