

UNIVERSITI TEKNOLOGI MARA

**ACCOMMODATION AND VERGENCE
FACILITY OF DRIVERS AND NON-DRIVERS
BASED ON REFRACTIVE ERROR**

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AUTHOR'S DECLARATION

I declare that the work in this study is considerably own, and for any part of this work which is not mine, I have indicated it by fully acknowledgement in accordance with the standard referring practices of discipline.

I, hereby, acknowledge that I have supplied with the Academic Rules and Regulations for Under Graduate, University Technology Mara (UiTM) regulating the conduct of my study.

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ABSTRACT

Background: Driving performance of an individual could be affected by many other factors of visual functions such as visual acuity, visual field, contrast sensitivity and visual attention. The clarity of an image was an important aspect during driving. Driving required the eyes to repeatedly change focus between near (instrument panel) and distance viewing (roadway). This ability of alternately shifting focus of accommodation and vergence demand was represented as accommodation and vergence facility. A delay during changing focus might contribute to road accidents as the images were blurry. However, accommodation and vergence facility might also be caused by refractive errors. **Aim:** The objectives of this study were to identify the accommodation and vergence facility of drivers and non-drivers based on refractive errors and to compare the accommodation and vergence facility between drivers and non-drivers. Besides, this study also aimed to identify the habitual driving setting of drivers based on refractive error. **Method:** In this study, the flipper lens of $\pm 2.00D$ lens was used to measure accommodation facility and flipper prism of 12Δ base out and 3Δ base in was used to measure vergence facility. The habitual driving setting was measured from the distance of drivers to dashboard and rear mirror. **Result:** The results of Kruskal-Wallis test showed that no significant difference between emmetropic and myopic non-drivers on MAF, $p= 0.796$, BAF, $p = 0.470$, and VF, $p= 0.379$. There also no different between myopic and emmetropic drivers on MAF, $p= 0.290$, BAF, $p= 0.302$, and VF, $p = 0.816$. Emmetropia showed no significant difference between drivers and non-drivers on MAF, $p= 0.524$, BAF, $p= 0.706$, and VF, $p = 0.839$. Myopia also showed no significant difference between non-drivers and drivers on MAF, $p= 0.182$, BAF, $p= 0.159$, and VF, $p = 0.230$. Emmetropia and myopia showed no difference of distance of drivers from dashboard, $U= 63.50$, $z= -1.059$, $p= 0.290$ and rear mirror, $U= 65.00$, $z= -0.983$, $p= 0.326$. **Conclusion:** Accommodation and vergence facility did not differ between drivers and non-drivers based on refractive error in this study. However, this was based on the data without any driving task involved. Further study should be looking at accommodation and vergence system during or after driving task.

Keywords: Accommodation facility, Vergence facility, Refractive error, Drivers

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