

Assessment of Whole-Body Vibration (WBV) Exposure and Neck Pain Disability Index among UiTM Bus Driver

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Structured Abstract

Background: Vibration refers to every regular movement a body produces in relation to a fixed point. Bus drivers are exposed to vibration from the movement of the vehicles on the road, which also vibrates the driver's body and the bus seat. The level of WBV that drivers are exposed to in their daily lives is impacted by several factors, such as the bus's design, its speed, the condition of the road, and the driver's position. As a result of their exposure to vibration, bus drivers are consequently at risk for Musculoskeletal Disorders (MSDs) related to low back pain, neck pain, sciatica, and disorders like decreased motor function.

Methods: This study provides insights on the exposure of whole-body vibration among bus drivers from the measurement using the Six-Channel Human Vibration Meter and Analyzer SV 106 D and seat accelerometer SV 38V, as well as the prevalence rate of self-reported neck pain symptoms linked to this exposure among UiTM bus drivers.

Results: Daily exposure level A (8) for both trips, route J (N=6) and route K (N=6) was found to range between $0.341 \pm 0.107 \text{ m/s}^2$ to $0.485 \pm 0.008 \text{ m/s}^2$, while vibration dose value (VDV) was between $4.264 \pm 0.115 \text{ m/s}^{1.75}$ to $6.184 \pm 0.106 \text{ m/s}^{1.75}$ for both trips, respectively. Vibration exposure, A (8) and VDV for both routes were recorded below the Exposure Limit Value (ELV) of international standard ISO 2631-1:1997 and Health Guidelines Caution Zone (HGCZ). From the Neck Pain Disability Index Questionnaire, 75.5% (N=34) of drivers were reported to have a minimal disability, 20.0% (N=9) of drivers were classified as having a moderate disability and 5.0% (N=2) of them had a severe disability. Nevertheless, no clear correlation was observed between vibration exposure A (8) and VDV, with neck pain disability index.

Conclusion: Overall, control measures can be implemented to avoid unnecessary exposure to vibration in the future among bus drivers such as regular maintenance services and installation of air seat suspension technology to the driver seat.

Keywords: Whole-body vibration, daily vibration exposure A (8), dose vibration value (VDV), neck pain disability index (NDI), musculoskeletal disorders (MSDs).

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