

Assessment of Whole-Body Vibration Exposure and Self-Reported Lower Back Pain among UiTM Bus Drivers

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Structured Abstract

Background: Vibration is commonly defined as an oscillating motion of a mechanical system or body and plays a role to humans as it affects comfort and their needs. Bus drivers are exposed to Whole-body vibration (WBV) due to contact with the vibrating surface for a long working period. Lower back pain (LBP) associated with WBV is an increasing problem that continues to get worse throughout the world.

Methods: This cross-sectional study was conducted among 42 UiTM bus drivers to assess the WBV exposure and its relationship with lower back pain.

Results: The mean of vibration daily exposure A (8) and Vibration Dose Value (VDV) obtained in this study were $0.422 \pm 0.024 \text{ m/s}^2$ and $5.537 \pm 0.579 \text{ m/s}^{1.75}$ respectively. The value of A (8) was ranging from 0.341 m/s^2 to 0.485 m/s^2 while the value of VDV was between $4.264 \text{ m/s}^{1.75}$ to $6.184 \text{ m/s}^{1.75}$. None of the vibration exposure values recorded exceeding Exposure Limit Value (ELV) recommended by Health Guidelines Caution Zone (HGCZ) and ISO 2631-1. However, there were drivers of bus J (N=4) and drivers of bus K (N=4) have exceeded Exposure Action Value (EAV) of A (8) recommended by ISO 2631-1. Based on the findings of Specialized Nordic Questionnaire for lower back pain, all respondents experienced lower back problems such as aches, pain, or discomfort. Additionally, 54.8% (N=23) of respondents reported that LBP had reduced their work activities and 52.4% (N=22) reported had reduced their leisure activities in the last 12 months. Moreover, 71.4% (N = 30) LBP prevents the bus drivers from doing normal work for 1-7 days.

Conclusion: Nevertheless, no clear correlation was observed between vibration exposure A (8) and VDV, with lower back pain problems. Control measures suggested by Guidelines on Occupational Vibration (2003) to keep the vibration exposure values below the limit subsequently mitigate the health effects associated with WBV include regular maintenance or servicing of buses systems.

Keywords: Whole-body vibration, daily vibration exposure A (8), bus drivers, vibration dose value (VDV), lower back pain (LBP)

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