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GRIP STRENGTHS AND SEGMENTAL VIBRATION A REVIEW

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Abstract

The relationship between grip, push and contact forces applied to a tool handle is related with handle diameter, vibration magnitude. The study of these inputs and output variables are very important to study the effects of segmental vibration. The results suggest that the hand–handle contact force is strongly dependent upon not only the grip and push forces but also the handle diameter. The results further suggest that a linear relation can characterize the dependence of the contact force on the handle diameter. It is also found that the friction force can stabilize the grip action and marginally increase the grip strength. Study clarifies relationships between vibration exposure characteristics and their effects on grip and push force-recall performance. Exposure to higher vibration magnitudes results in the activation of greater numbers of mechanoreceptors. The industrial subjects demonstrated the pattern of perceived effort exertion for pinch and grip activities similar to those of non-industrial subjects. Knowledge of vibration effects and the effects of hand–handle coupling characteristics may foster the development of weighting factors for improving force recall application. Duty cycle was affected significantly by force, wrist angle, exertion period, interaction. Rest-to-work ratio was significantly affected by the force, wrist angle, exertion time, and force by exertion period interaction. Shoulder and elbow angles had significant effect upon the grip strength. Similarly, it was seen that grip strength at elbow at 135 degrees flexion was significantly different from those with elbow at 90 and 180 degrees. The greatest strength was achieved at the smallest grip width and the weakest at the largest width.

Keywords: Grip strength, Grip force, Pinch grip, segmental vibration, vibration exposure