

Effect of monocular degraded vision on manual dexterity performance using the grooved pegboard test

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ABSTRACT

Introduction: Manual dexterity plays a role in how individuals interact with and learn about their surroundings. Challenges in manual dexterity may interfere with the precise movements for everyday tasks. This study investigates the effect of monocular-induced degraded vision on manual dexterity performance using the Grooved Pegboard Test (GPT) in young adults. **Materials and Method:** Normally sighted individuals with best corrected visual acuity, and no binocular vision anomalies, diagnosed neurological disorders, or physical impairment were recruited in this study. The frosted lens is used to simulate the visual effect of monocular visual degradation. The procedure involves the execution of the GPT with degraded dominant eye, the execution of the GPT with degraded non-dominant eye and the execution of the GPT with no visual degradation. **Results:** 31 normally sighted young adults with mean age 22.70 (1.33) participated in this study. The mean score for GPT with degraded dominant eye was 97.96 (7.50), degraded non-dominant eye was 91.42 (5.54), and no visual degradation was 86.05 (5.56). There was significantly reduced manual dexterity performance with the degraded dominant eye compared to the degraded non-dominant eye ($t(30) = -6.82, p = 0.000$), degraded dominant eye compared to no visual degradation ($t(30) = -11.29, p = 0.000$), and degraded non-dominant eye compared to no visual degradation ($t(30) = -9.20, p = 0.000$) with paired-t test. **Conclusion:** There was a significant reduction in performance under conditions of visual degradation, with a more pronounced decline when the dominant eye was impaired. These findings provide insight for future research developing visual rehabilitation strategies to support individuals with compromised vision.