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# ERGONOMIC EVALUATION OF A HIGH-PERFORMANCE GAMING INPUT DEVICE AND A COMPARISON WITH TRADITIONAL DEVICES

Jacob Van Dyke \*, Occupational Safety and Health, Montana Tech, Butte

**Objective:** The goal of this study is to address the need for research on the ergonomic effects of computer gaming by providing an objective, ergonomic evaluation of a gaming input device using a simulated gaming task that compares ergonomic and performance measures with traditional computer input devices. The computer input devices included one traditional, a rollerball, and a gaming input device.

**Methods:** 20 participants wore sEMG sensors placed on the abductor pollicis brevis of the right hand. The subjects' maximum voluntary contraction (MVC) was recorded at the beginning of the study. Performance was measured by recording the number of correct sequences that subjects completed during their trial, while force was measured using sEMG. A Welch's one-way ANOVA (Analysis of Variance) was used to analyze statistical significance of the data; a Games-Howell Pairwise Comparison test was used for the post hoc analysis.

**Results:** The difference in mean force exerted by the abductor pollicis brevis for the input devices was significant ( $p < 0.001$ ). The number of correct sequences completed by each subject, was also significant ( $p < 0.001$ ). Two post-hoc comparisons were statistically significant for each data set. The %MVC for the gaming input device was significantly different from both the rollerball input device ( $p = 0.021$ ) and the traditional input device ( $p < 0.001$ ). The number of correct sequences for the traditional input device was significantly different from both the gaming input device ( $p < 0.001$ ) and the rollerball input device ( $p < 0.001$ ).

**Conclusion:** The results of this study suggest that there is a possibility that gaming input devices increase force exertion while performing gaming tasks which may increase the risk of developing MSD's of the hand and thumb, without an apparent increase in performance within the constraints of this study. Further research is needed to determine if similar results exist during a gaming task performed by actual gamers.