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The effects of wrist splints on shoulder muscle fatigue levels achieved during retail scanning tasks

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Musculoskeletal disorders (MSDs) of upper extremities are a common problem amongst cashiers' in the retail workforce. In this study, the impact of wearing wrist splints upon the exertion and fatigue levels experienced in cashiers' shoulder muscles during a retail scanning task was determined. Twenty participants (10 males and 10 females) were recruited for data collection. Surface electromyography was used to measure shoulder muscle activation under three different splint conditions; wearing no splint, a restrictive splint and a non-restrictive splint on four shoulder muscles. Four shoulder muscles were investigated; the upper trapezius, anterior deltoid, posterior deltoid, and the lateral deltoid. Participants were asked to perform a scanning task using a one gallon jug of water with their dominant hand under the three different test conditions. The median frequency was calculated as a muscle fatigue indicator for the first and last data window of 3 seconds for all muscles under the three different splint conditions. Results determined female participants were more fatigued than male participants. There were significant differences in muscle activation/fatigue levels across the different muscles. Gender had no effect across all the four muscles activation level. The fatigue levels were not significantly different across all the different splint conditions. This study suggests that while there are differences in shoulder muscle activation/fatigue levels attained in scanning tasks, the use of wrist splints did not affect, positively or negatively, the level of shoulder muscle activity.

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