A Study of Combined Manual Materials Handling Tasks under Footwear and Lifting and Lowering Height Conditions

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Abstract

A study on combined manual materials handling tasks performed on floors under three footwear and four lifting and lowering height conditions. Twelve male subjects participated in the study. The maximum acceptable weight of handling, including lifting, carrying for 3 m, lowering, and walking 3 m back at 2 per minute was determined. The subject then performed the same tasks for 10 minutes. The VO2, heart rate, and rating of perceived exertion for whole body strain were measured. The results showed that the effects of footwear on the maximum acceptable weights of handling (MAWH), heart rate, and VO2 were not significant. The effects of lifting and lowering height on all dependent variables except rating of perceived exertion were statistically significant (p0.027). Lifting from the floor and lowering on the floor condition was the most stressful condition than all other lifting and lowering condition. The subjects had the lowest MAWH on this condition. In addition, lifting from the floor and lowering on the floor condition resulted in the highest physiological responses including both VO2 and heart rate. The effects of lifting and lowering height on RPE was, however, not significant. The implication of this study was that lifting and lowering height should be regarded as one of the major job factors in designing MMH tasks as it affected physiological responses of the subjects. This is consistent with the findings in the literature.

Keyword：manual materials handling, physiological response, subjective rating.