Developing a new vertical multiplier to modify the revised NIOSH lifting equation

ABSTRACT

Amongst occupational disorders, musculoskeletal disorders and, most importantly low back pain is the most frequent ones. The most popular and widely used risk assessment method among ergonomists for estimating LBP exposure risk is the Revised NIOSH Lifting Equation. In order to improve RNLE, many studies have been carried out yet, and their limitations have been described. One of these cases is the inconsistency of vertical multiplier with anthropometric conditions of various workers' societies. Methods: In the present study, by designing a laboratory work, VM has been carefully considered. Thirty-one volunteer students consisting of 19 males and 12 females, participated in two tests, using a dynamometer; and results were analyzed by Minitab software. Results: The results have shown a significant relationship between isometric muscular strength in two tests, but there was no correlation between body mass index and isometric muscle strength. Based on results, VM, permissible, and the optimum range of manual lifting location height were analyzed and adapted to volunteers' condition. Conclusion: It seems that with changes that have been made, the RNLE results can be more proportionate for Iranian workers.

Keyword: Ergonomics; Manual handling; Risk assessment; Vertical multiplier; Muscle strength