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Abstract
This study aimed to evaluate the risk of low back injury of lifting in manual materials handling tasks. This study examined human maximum whole body isometric lifting strength in two lifting heights and five lifting postures, and their effects on the force generated at the L5/S1 disc. This study collected human maximum whole body isometric lifting strengths and body joint angles when lifting for different lifting heights and lifting postures. Then, this study applied low back evaluation program for manual materials lifting to calculate the compression and shear forces generated at the L5/S1 disc when performing maximum whole body isometric lifting strengths. The risk evaluation of low back injury for exerting maximum whole body isometric lifting strengths was based on the compression and shear forces generated at the L5/S1 disc.
The overall results demonstrated that the effects of lifting height, posture, and their interactions on the force generated at the L5/S1 disc were significant. We could reduce the risk of low back injury caused by overexertion in low lifting height through human factors intervention. We also could arrange a more efficient lifting height and safer lifting posture. This study recommended that a greater maximum isometric lifting strength could be exerted in a more extended legs posture, while the posture of full flexed legs would be safer.
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