

ABSTRACT

Materials handling was used in many jobs. The rate of risk factors in materials handling were not reduced but increased all the time. Pushing tasks were very important in the materials handling field. This thesis may be of great use to those interested in materials handling.

The purpose of this study to investigate in to the factors of pushing force and how they are related. Studying EMG signals and the factors for designing the experiment; to understand the effect of pushing force related to compressive force. The study of compressive force on L5/S1 disc in order to compare with the maximum permissible limit of NIOSH (1981).

The method used in the designing of this experiment involved the use of four factors: high levels (shoulder, elbow and hip), coefficient of friction (>0.6 and <0.3), posture of pushing task (setting posture and free posture) and handle type (horizontal and vertical). The ten male subjects were more than 20 years of age with mean weight of 62.34 kg., mean body high of 169.88 cm., mean age of 21.2 years and used a biomechanical approach to calculate the compressive the force on L5/S1 disc.

The results of this study showed that pushing force at a high level have a high compressive force which is greater than at a low level. The EMG signal showed a high signal at high level which then decreased at low level. The ratio of F_p / F_c has a high value at low level and a low value at high level. The maximum compressive force on L5/S1 disc was 4838.60 N and the minimum was 1590.50 N. The optimum pushing task condition in this study was the coefficient of friction > 0.6 , free posture, vertical handle type, $F_p / F_c = 0.2177$, $F_p = 677.8$ N and minimum $F_c = 1590.5$ N

The conclusion of it was found that the maximum compressive force on L5/S1 disc was higher than the AL, but lower than the MPL. There were many factors involved in the high efficiency pushing task.