

An Ergonomic Evaluation and Analysis for Identification of Risks Factors that Contribute to Musculoskeletal Disorder and Other Related Illness Exposures in Sugarcane Harvesting

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Abstract

The study involved the associated effects of individual attributes and work characteristics in the health and productivity of a sample size of farmers working in sugarcane plantation in the province of Batangas, Philippines. The individual attributes and work characteristics were tested with the frequency and severity of stress symptoms to identify the risk factors that contribute to the occurrence of musculoskeletal disorder and other related illness to sugarcane farm workers. Subject used in the study were 169 sugarcane farm workers. All of them were male aged between 18-40 years old. Sugarcane harvesting process was considered in the study, which involves cutting and piling of stalks, lifting and loading of bundles of stalks in the truck and piling of loaded stalks in the truck. The individual attributes; work characteristics; and frequency and severity of stress symptoms were obtained from the constructed Checklist for Identifying Ergonomic Risk Factors in Sugarcane Production. Somer's D technique was used for correlation analysis between variables. Rapid Entire Body Assessment (REBA) and Rapid Upper Limb Assessment (RULA) were also utilized to determine risk factors associated to work related musculoskeletal disorder. The result of correlation analysis showed that individual attributes of age, height and weight; lifting distance and frequency; rest period frequency; activities such as loading and piling in the truck; and working postures were associated to musculoskeletal disorder symptoms. It was found that farm workers' rest period frequency was correlated with their output. REBA and RULA analysis indicated that sugarcane farm workers especially in harvesting process are exposed to a likely high risk of musculoskeletal disorder pertaining to posture, load, movement activity, and movement distance. Recommendations in order to minimize farm workers' exposure on postulated risk factors of work-related musculoskeletal disorder and other related illness include the development of an easily applicable in field and suitable guideline for the proper execution of manual works on farming specifically on sugarcane harvesting process was suggested. Provision of farming machineries and equipment for sugarcane production could also be considered on some critical tasks. The performance of parallel clinical studies on the effects on health of farm workers' exposure to probable work-related musculoskeletal disorder risk factors that will justify more for ergonomic intervention in agricultural sector was also recommended. It was also suggested that the sugarcane full production process and other critical farming activities be likewise assessed to strongly identify landmarks for involvement of ergonomic approaches and standards in agricultural work setting.