

Ergonomic Risk Factors and Safety Issues in Metal Working Industries-A Case Study of LPG Cylinder Manufacturing Unit in Karnataka

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Abstract

The basic processes in metal working industry poses several risks and hazards to the workers. The major processes include metal cutting, forming, welding, stamping, heat treatment, painting and laser marking. These processes involve working in awkward postures, noisy environment and poor working conditions (as in small scale industries) and are major contributors to the work-related musculoskeletal disorders and raise safety concerns. The present study focuses on identifying the ergonomic risk factors and safety issues in a small-scale LPG cylinder manufacturing industry located in Karnataka State. Further it is proposed to investigate the awareness of workers to safety and use of personnel protective equipment (PPEs). The study comprises of about 35 workers from different sections like cutting, forming, welding, painting etc. were selected for the study. The workers/operators reported high musculoskeletal complaints, back, neck and shoulder discomfort and pain in knees and ankles as a result of awkward postures during work. The methodology includes observation and collection of demographic data, administering body part discomfort questionnaire, postural risk analysis by rapid upper limb assessment (RULA) and rapid entire body assessment (REBA), and measurement of environmental parameters like noise, illumination. The results show more than 60 percent reported discomfort in upper limbs and lower back. Results of posture risk analysis by RULA assessment method indicates about 58 percent in high-risk category requiring immediate change. The posture analysis by REBA shows about 43 percent in high risk and 13 percent in very high-risk categories. The use of safety devices like safety shoes, helmets, masks, eye shield and ear plugs were found to be negligible. Workers often complain about general

health and musculoskeletal discomfort. The study has highlighted that the safety measures and awareness can be further strengthened and workers should be motivated and encouraged to use safety gadgets, and low-cost ergonomic interventions may be required to reduce the risks due to awkward postures.

Keywords

Metal Working, Posture Analysis, RULA, REBA, Musculoskeletal disorders