

Identification of Ergonomic Risk Factors and Safety Concerns in Metal Fabrication Industries

S.M.Hasanuddin

Student, Methodist College of Engineering and Technology
Hyderabad, India

s.hasanuddin20@gmail.com

Qutubuddin S.M.

Associate Professor

P.D.A. College of Engineering, Kalaburagi, India

syedqutub16@gmail.com

Ayesha Fatima

Student, Stanley College of Engineering and Technology for Women
Hyderabad, India

ayeshafatimaNMEIS@gmail.com

Abstract

The basic process in metal fabrication industry is welding which poses several risks and hazards to the workers. Welding process is the common method of metal joining and contributes to work related problems. The present study aims to identify the ergonomic risk factors and safety issues in welding units located in Karnataka State. Further it is proposed to investigate the awareness of workers to ergonomic risks, occupational safety and use of personnel protective gear (PPEs). The study comprises of about 60 workers from 10 different industries. The study is divided into three types of industries; general fabrication (06 units), furniture making (02 units) and heavy fabrication work like tractor trailers, pressure tanks (02 units). The welding methods include horizontal welding, vertical welding and overhead welding. Welding operators report high musculoskeletal complaints, back, neck and shoulder discomfort and pain in knees and ankles. 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. Results indicate more than 70% workers reported discomfort in upper limbs and low back. Eye strain was the most common discomfort. Postural risk analysis by RULA shows 57% postures in high risk, mostly in overhead welding. REBA analysis shows 51% postures in high risk and 13% postures in very high risk, mostly in horizontal welding. It is found the use of safety devices and personnel protective gear is very low except the eye shield or goggles which reported 93% usage. Other safety devices like masks, gloves and apron have less than 12% usage. The use of ear plugs/muffs is about 16%. Apart from these observations, the workers often complain about general health like vision problems, accidents and injuries to body and job stress. The study has highlighted that the safety measures and awareness can be further strengthened and low-cost ergonomic interventions may be required to reduce the risks due to awkward postures.

Keywords

Welding, Occupational Health & Safety, RULA, REBA, Musculoskeletal disorders