Rolling mills of West Bengal, India: Present scenario and scope for improvement

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1. Introduction

In India, the micro, small and medium enterprises (MSMEs) have been recognized as an effective tool to expand employment opportunities, ensure equitable distribution of the National income and facilitate effective mobilization of private sector resources of capital and skills (Jahanshahi et. al, 2011). Today steel re-rolling is an important industry in the country. The rolling mills of West Bengal, India are very old and use primitive technologies. The objective of this study was to assess the existing conditions of these re-rolling mills and also to evaluate the occupational health problems of the workers engaged in these re-rolling mills.

2. Method

The study was conducted in 16 steel re-rolling mills of West Bengal, India. Workplace condition was assessed using an Ergonomics checklist, video recording and still photography. 100 workers were randomly selected from these mills. Standard Nordic musculoskeletal questionnaire (Kuorinka et. al, 1987) was performed among them to find the prevalence of musculoskeletal disorder (MSD). The repetitive nature of their work was evaluated using the Assessment of Repetitive Tasks of the upper limbs tool (ART) (HSE, 2010). The working postures were studied using the Ovako Working posture Assessment System (OWAS) (Karhu et. al, 1977). The physical and mental health status of the workers was assessed using the SF-12 questionnaire (Ware et. al, 1995).

3. Results

The workplace conditions are poor with bad housekeeping. The raw materials and the finished goods are not properly stored. Due to this, the probability of accidents is high. The questionnaire analysis revealed that 66% of the workers met some kinds of accidents in the past 12 months. The workers do not use standard personal protective equipments (PPEs) which also augments their vulnerability to accidents. The most frequently occurring (61%) injury was burn, followed by cuts (55%) in various body parts.

The mean age of the workers is 36.4 ± 7.7 years. On an average the workers have a working experience of 16.0 ± 7.3 years. The workers work for eight hours daily with one break. The ART score was found to be 54, which indicate that this is a highly repetitive job and further investigation is required urgently. 88% of the workers reported as having pain symptoms in at least one of the body part in past 12 months. Most of the respondents reported to suffer from pain in the lower back (58%), followed by forearm (54%), knee (48%), neck (42%) and shoulder (39%). The mean physical composite score and the mental composite score of the workers was found to be less than 50 (below average).

4. Discussion

This paper presented the current situation of the rolling mills of the industrial belt situated in West Bengal, India. The strengths of these rolling mills are low investment, easy availability of raw materials and acceptability of the finished goods. The health and safety aspects of the workers are poor. The prevalence of MSDs is high among the workers of these mills. There are scopes for ergonomic improvements. Addressing work organization factors may improve the productivity of the factories and thus improve the condition of the workers. The paper also states some of the ergonomic recommendation that can be applied to improve the safety and workplace condition of these rolling mills. Ergonomic modification of the workplace can aid in reducing the chances of developing musculoskeletal disorder. Proper PPEs can be provided to the workers to safeguard them against the workplace hazards. The workers need to be trained and made aware about the need of the PPEs and when and how to use it.
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References
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