Assessment of occupational risk factors among stone art workers.

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1. Introduction

Health is state of complete physical, mental and social well being. Good health and safety performance of an organization ensures an accident free industrial environment. Occupational health is considered as a vital contributor and believed to be one of crucial element to the success of industries. Stone Art workers have many health problems related to work environment and postures. Therefore special attention should be paid on designing the workplace for improving health and efficiency of the workers. Hence, the study was undertaken with the following objectives: (1) To assess occupational health risk factors of workers engaged in stone art work. a) Assess health status of workers. b) Analyze posture used by the workers. c) Musculoskeletal disorders experienced. d) Pulmonary ventilation capacity of workers. (2) To study environment parameters at workplace of the stone art workers.

2. Methodology

The study comprised of a sample of 30 male workers engaged in stone art industries from at least last five years. An interview schedule was used to elicit work profile, health status and working environment of workers in different sections of the stone art units viz; Designing, Tracing, Jewellery making, Calibration, Engraving, Fixing and Polishing. The work profile included information pertaining time spent, frequency of performing various activities, fatigue, load handled, duration, type of rest period and repetitive task performed by workers. Health status was assessed using BMI and VO_2_\text{max}. Body Map technique assessed musculo-skeletal problems. ART (Assessment of Repetitive Task) was used to assess occupational risk factors of the stone art workers. ART measured frequency and repetition of movements, force, awkward posture of neck, back, arm, wrist and hands, as well as some additional features like breaks, durations and workplace etc. To measure the pulmonary fitness capacity of workers PEFR (Peak Expiratory Flow Rate) meter was used for the workers in different section of the stone art units.

3. Results and Discussion

Results of the study revealed that 50% of the respondents fell in low weight normal or chronic energy deficient category of BMI, while 50% of the respondents suffered from respiratory diseases and hypertension. Majority of respondents (90%) experienced neck, shoulder, wrist and knee pain as a result of working in awkward postures of squatting and bending and frequent repetitive task for long hours. The ART score for risk factors as shown in Fig 1, fell in the category of ‘High’ exposure level (more than 22 score) which designate ‘further investigation required urgently’, for (100%) workers in Engraving section and for (50%) in Jewellery making section while for rest of the sections the risk score were in the category of ‘Medium’ exposure level (12-21 score) i.e. (100%) workers in calibration, (100%) in Fixing and Filling, (100%) in Designing and Tracing, and (50%) in Jewellery making, which designate ‘Further investigation required’. For majority of workers lung capacity was less than 50% of the standard PEFR values. Results on environmental parameters revealed that the summer temperatures were exorbitant (41-42°C) and workers reported that it become very different to work in summers the average light intensity in three Stone Art Units under study was considerably low as compared to standard values it was revealed out of three units, the two units were exceeding the sound level to 85 dB and one unit was reaching the sound level up to 94.77 dB which was alarming and very harmful for the workers.
It was found that the stone art workers suffer from many health problems and musculoskeletal disorders, like pain in joints, reduced leg and back strength, low pulmonary ventilation capacity, low BMI etc. Moreover, postural assessment through ART tool indicated that immediate changes are required in their postures and workplace. The employers and workers need to be sensitized for improving workstation layout on ergonomic parameters for improving posture at work so as to achieve enhanced health, efficiency and productivity of stone art workers. Considering this, a set of suitable guidelines for improving the workplace design and posture were suggested by the researchers. The safety guidelines are useful for both employer and workers to establish job- fitness compatibility.

The results of present study were useful to sensitize skilled workers of stone art industries and similar other units towards postural discomfort at work and resulting health problems. It will serve as a path line for stone art workers to improve their working posture. The guidelines evolved for the workers can guide them to enhance the productivity and improve overall efficiency in work. The results will be useful for employers of such workers to understand the relationship of proper workplace and environmental conditions for maximizing production and worker efficiency. The safety guidelines will be of help for both employer and workers to establish job- fitness compatibility. Also, the study will give clues to other researchers for further investigation in this field of study.
Fig 1 Percentage of respondents by exposure score to Risk Factors in different sections of Stone Art Units using ART.

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References