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ASSESSMENT OF RISK DUE TO WHOLE-BODY VIBRATION IN OPENCAST COAL MINES: A CASE STUDY

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Abstract

Last few decades have brought, together with technological development in mining industries, faster machines with greater power-to-weight ratios and consequently increased occupational hazard. This has led to an increased number of people affected by it, which in turn has resulted in the development of more advanced investigations, assessment methods and criteria for exposure to occupational hazard. One of such occupational hazard is whole-body vibration. Over the years whole-body vibration has mainly been associated with transport. It can be transport of people, goods or materials, when vibration of the vehicle is transmitted through the floor and seats to the body of a person inside

The objective of this study was to study the risk involved due to whole-body vibration. The present study was carried out to determine the whole-body vibration exposure in one of the open cast mines on the operators of heavy earth movers which included Backhoe, Dump truck, Dozer, Blasthole Drill.

This study was performed on 4 Backhoe operators, 3 dump truck drivers, 1 Dozer operator and 1 Blasthole Drill operator. After analyzing the data obtained from Larson and Davis make Human Vibration Meter (Model HVM 100) using Health guidance caution zone (ISO 2631-1), a dozer and a dumper operator fall under the zone "caution of health risk indicated" while two dumper operators fall under the zone "health risks are more likely". Rest all backhoe and blasthole drill operators fall under the zone "no health risks involved".

Keywords: occupational hazard, whole-body vibration, open cast mines, drill operators

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**ERGONOMIC ASSESSMENT: RISK EXPOSURE AMONG
CONSTRUCTION WORKERS**Joshi Pratibha and Sharma Promila

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Construction is one of the largest industries in India, employing 7.6 million workers, or about 5% of the Indian work force. Construction workers face some of the most dangerous working conditions in the country on a daily basis.

Ergonomic problem is common hazard and is one of the most common causes of injury at work. The accurate measurement of workers' exposure to the risk assessment of WMSDs has been of vital importance. Musculoskeletal system primarily concerns with dimensions, compositions & mass properties of body segments, and work related musculoskeletal disorder caused due to over exertion, adoption of asymmetric & awkward postures and unsupported positions used in task completion. Many MSDs are due to operations performed for a long period, can cause a lifetime of pain and disability.

Therefore present investigation was planned to provide an objective measure of the MSD risk caused by construction work and to evaluate a job's level of risk for developing a musculoskeletal disorder in 120 construction workers with the application of REBA (Rapid Entire Body Assessment) postural assessment technique. It was found from observation that approximately 6 % of workers were in the category of AL_0 indicating 'negligible' risk level means no action is necessary indicating acceptable posture, 12.7% were in AL_1 (low risk, further action may be needed) and 63% of students in AL_2 (medium risk, action necessary).

However, 11 & 7.3 percent was found to be in AL_3 (high risk, action necessary soon), AL_4 (very high risk, action necessary now) respectively.

Keywords: Awkward posture, Construction worker, MSDs, REBA, Risk Level.

PREVALENCE OF WORK-RELATED DISCOMFORT AMONG TAILORS

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Abstract

Literature suggests that tailoring is an industry which poses an individual at risk of work related discomforts. Research pertaining to this group of people from India is rare and existing studies were confined to individual aspects of musculoskeletal discomfort encountered by the tailors. Hence the purpose of this study was to estimate the prevalence rates of work related discomforts in this population.

A cross-sectional study, using a questionnaire based survey was carried out on 236 tailors in Manipal and Udupi. Questions included data on demographics, work related factors, type of work, choice of machine, duration of work and physical manifestations, in various parts of the body.

Prevalence rates were calculated. Percentage of people with eye pain and headache accounted for 13.56% and low backache and thigh and pain in calf were 13.98%. Trends in the data suggest that people working for equal to 8 hours and who had been in work for longer duration were more prone to work related discomforts. Headache was also found to be more common in people who were employed by others and engaged in 8 hrs of work. Manual machine usage showed higher levels of discomfort.

The most common discomforts identified were eye pain, headache and low back and thigh pain. Usage of manual machine and formal employment show trends of increasing risks for work related discomforts.

Keywords: Sewing machine users, tailoring, work-related discomforts, repetitive stress injuries

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OCCUPATIONAL RISK ASSESSMENT OF THE WORKERS ENGAGED IN ORGANIZED POULTRY FARM THROUGH OSHA SCALE

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Abstract

With wide spread mechanization and automation in every field, there has been a significant increase in reporting of musculoskeletal disorders and other work related disorders due to ergonomic hazards. "OSHA defines ergonomics as the science of fitting the job to the worker, and when there is a mismatch between the physical requirements of the job and physical capacity of the workers, work related musculoskeletal disorders can result.

To find out the risk involved of poultry workers in task performances in various activities already standard OSHA scale was used. A total 60poultry workers were taken to identify the risk involved in slip, trips, falls, struck by, struck against, caught in, lock out/tag out procedures, ergonomic hazards (repetitive motion and lifting), health hazards and noise. It was found through OSHA scale that the risk was involved mainly due to wet surfaces, slippery foot wears, holes in the floor, spilled material etc. Besides this risk was also found while performing repetitive upper extremity motions, extended reaches, overhead work, elbow/forearm twisting, trunk twisting etc.

It was found that these accidents are mainly due to lack of awareness and technical knowledge to use the machines. The analysis emphasizes that work practices exists to regulate the risk but the necessity is to apply them in presence of trained officials. Besides this short training programme should be organized to educate employees an health and safety aspect.

Key words: Musculoskeletal disorder, Poultry workers, Occupational risk t, Ergonomic hazards

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AN ERGONOMIC APPROACH FOR MODIFYING THE POTTER'S WORKSTATION

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Abstract

In the present investigation efforts have been made to modify the work station of a potter from the ergonomic viewpoints. The study has been conducted on 30 potters selected from different villages of the Paschim Medinipur district of West Bengal state. The musculoskeletal disorder of the potter was evaluated by questionnaire method. The resting and working heart rate of the subject was determined by 30 and 10 beats time recording method respectively and oxygen consumption was determined by indirect method. The center of gravity and the spinal curvature of the subjects were determined by standard methods. The anthropometric dimensions of the subjects were taken in standardized static conditions.

The potter's workstation was modified by providing a suitable seat compatible to the body dimension of the users and by changing the distance of the center of potter's wheel from seat, height of the wheel, and distance of raw materials according to the anthropometric dimension of the users. For the evaluation of the modified design of the work station different biomechanical parameters, physiological parameters (pulse rate and O₂ consumption), segmental pain and productivity were studied. From the subjective assessment it has been noted that the different segmental discomfort was reduced remarkably in modified workstation than that of existing one.

Results also indicated that from the modified workstation the potters got better mechanical advantages than that of existing one and productivity showed a slight improvement. It has been concluded that the ergonomic intervention may provide better comfort to the potters.

Keywords: Potter's work station, ergonomic intervention, MSD

ERGONOMICALLY DESIGNED OFFICE CHAIR: USER'S PERSPECTIVE

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Abstract

Different features of the ergonomically designed office chair were the focus of the study and 'user trial' was felt to be the most appropriate. The objectives were to ascertain user's perspective on the functionality of the ergonomically designed office chair, verify the safety and stability of the chair and establish the Comfort/discomfort experienced by the users.

Three offices in Mumbai using the same model/design of ergonomic office chair were identified. One hundred respondents who had used the chair for at least six months and attempted to adjust it once, were selected through purposive sampling technique without consideration to gender and position held. Data were collected through an interview schedule and a comprehensive checklist based on the checklist by Worksafe Australia was used to obtain user's perspective on the functionality, safety and stability of the ergonomic chair. Comfort and discomfort were evaluated. Likert type of scaling technique was used on a five point scale for evaluations. Comparison of two user groups based on experience was evaluated statistically (Z test) to establish significant differences.

The study revealed that no adjustment instructions were provided on the chair nor was any demonstration given regarding its use. Most of the features of the chair like seat, backrest, arm rest functioned to some extent as desired, adjustability functions were cumbersome and not smooth.

The chairs were found to be safe and stable in terms of assembly, finishing, and base support and comfortable. The overall task of adjusting any of the adjustable features provided in the chair was complicated and very uncomfortable. Experience in adjusting and using the chair for a longer period did not make any significant difference in adjusting and using the chair in a better way.

Key Words: Ergonomic chair, adjustability, functionality, comfort/discomfort