Work Place Ergonomics- A Review

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Abstract

Ergonomics is the study of the interaction between people and machines and the factors that affect the interaction. Its purpose is to improve the performance of systems by improving human machine interaction. This can be done by 'designing-in' a better interface or by 'designing-out' factors in the work environment, in the task or in the organization of work that degrade human–machine performance. Systems can be improved by • Designing the user-interface to make it more compatible with the task and the user. This makes it easier to use and more resistant to errors that people are known to make. • Changing the work environment to make it safer and more appropriate for the task. • Changing the task to make it more compatible with user characteristics. • Changing the way work is organized to accommodate people's psychological and social needs. This article presents on overview on current knowledge on work place ergonomics.

Keywords- *Ergonomics, Work Place, Job Stress, Work Site Analysis.*

Introduction

The word ergonomics comes from two Greek words: ergon means work and nomos meaning laws. Ergonomics covers all aspect of a job; from the physical stresses it places on joints, muscle, nerves, tendons, bones and the like, to environmental factors which can affect hearing vision, and general comfort and health. If work is performed in awkward posture or with excessive effort, fatigue and discomfort may result. Job are made up of tasks. Tasks are the things employees must do to accomplish their jobs. Some jobs may contain only a single task, but many jobs are made up of multiple tasks [(1)]

Contributing factors- the contributing factors both employers and employees should be aware of include: work environment, awkward postures, visual effort, repetitive motions, forceful exertion, pressure points and vibration.[(2)]

Ergonomics job analysis methods- there are many types of ergonomics job analysis methods. This method consists of various techniques for taking for taking a systematic look at jobs and work tasks. They help decide which jobs and specific tasks may contribute to problems. Some methods are relatively simple, and other requires detailed analysis and sophisticated equipment. Checklists are generally a simpler, less comprehensive type of ergonomics job analysis method. More comprehensive method breaks job down into specific movements (eg- reach, grasp, and place) or use other complicated techniques. Ergonomics job-analysis methods also vary according to what types of work activities they address. Some focus on workstation design. Other are more specific to certain types of work (eg- manual material handeling) or focus on the work environment (eg- lightning, cold exposure)[(3,4,5)]

Work site analysis- hazard prevention and control, Engineering control, Work practice control, Personal protective equipment, Administrative control.

Training and education- general training, Job specific training, Training for supervisor, Training for manager, Training for engineers and maintenance personal.

Site analysis- gathering information from available sources (injury report, employee, worker medications to Workstation),Conducting screening survey, Performing ergonomic job hazard analysis, Conducting periodic survey and follow up.

a) **Information Sources**- perform record analysis and tracking to identify ergonomic hazards, medical safety, and employee surveys

b) **Incidence Rates-**

- IR= new cases/yr (200,000hr) hours worked/ year
- Note: per facility
- Why 200,000hrs? Average worker puts in 2000 hours (work) per year- the IR consider the hours of 100 workers in its determination.[6-7]

Hazard prevention and control-

Purpose- make the job fit the person and to not make the person fit the jpb.

Activities- work station design, design of work methods, tool design and handles, understand you workplace population.

Work station design- a) designed for the individuals who actually use them. b)Not sufficient to design it for the average person. C) Should be designed large enough to allow for a full range of required movements.

Ergonomic Improvements- ergonomic improvements are changes that can be made to improve the fit between the job and the capabilities of the employee performing it. They are commonly grouped into 3 categories- a) engineering improvements b) administrative improvement c) personal protective equipment.

a) **Engineering Improvements-** it includes rearranging, modifying, redesigning or replacing tools, equipment, work station, packing, parts or products. These improvements can be very effective because they may reduce or eliminate contributing factors.

b) **Administrative Improvement-** it include changing work practice or the way work is organized administrative improvements usually require continual management and employee feedback to ensure that the new practices and policies are effective.

c) **Personal Protective Equipment-** it includes gloves, knee and elbow pads, footwear and other items that employees wear.

Training- an important part of effective ergonomics program is training and education. Training for affected employees should consist of both general and job specific training:

a) **General Training-** employee who is potentially exposed to ergonomic hazards should be given formal instruction on the hazards associated with their jobs and with their equipment. This includes information on varieties of CTD what risk factors causes or contribute to them, how to recognize and report symptoms and how to prevent these disorders.

b) **Job Specific Training-** new employee and reassigned employees should receive an initial orientation and hands on training prior to starting their duties. Each new hire should receive a demonstration to the proper use of and procedures for all tools and equipment.

c) **Training For Supervisors-** supervisors are responsible for ensuring that employees follow safe work practices and receive appropriate training to enable them to do so.

d) **Training For Managers'-** managers' should be aware of their safety and health responsibilities and should receive sufficient training pertaining to ergonomic issue at each work station and at the organizational level as a whole so that they can effectively carry out their responsibilities.

e) **Training For Engineers And Maintenance Personal-** plant engineers and maintenance personnel should be trained in the prevention and correction of ergonomic hazards through job and work station design and proper maintenance, both in general and as applied to the specific conditions of the facility.[8]

Job stress- it can be defined as the harmful physical and emotional response that occurs when the requirements of the job do not match the capabilities, resources, or needs of the worker. Job stress can lead to poor health and even injury. It results when there is a imbalance between the demand of the job with the workers capability, need and resources. The causes of job stress are nature of work (hectic and continuous long working hours without rest and breaks). Environment (sound and air pollution may also lead to stress). Management style(lack of participation by workers in decision making, poor communication in the organization, lack of family- friendly policies. Social relationship (lack of support from the co-worker and senior administrative

workers. job expectation (improper balance between the job demand and job expectations). Job satisfaction (workers feel that there is no job security, slow growth and promotion in his career)

Steps towards prevention- low moral, health and job complains, and employee turnover often provides the first sign of job stress. Lack of obvious or widespread signs is not a good reason to dismiss concerns about job stress or minimized the importance of a preventive programme.

Step 1- identifying the problem: the best method to explore the scope and source of a suspected stress problem in an organization depends partly on the size of the organization and the available resources. Group discussion among managers, labor representatives, and employee can provide rich source of information. Such discussions may be all that is needed to track down and remedy stress problems in a small company, in a larger organization, such discussion can be used to help design formal surveys for gathering input about stressful job condition from larger number of employees.

Step 2- design and implement intervention- once the sources of stress at work have been identified and the scope of the problem is understood, the stage is set for design and implementation of an intervention strategies.

Step 3- evaluate the interventions- evaluation is an essential step in the intervention process. Evaluation is necessary to determine whether the intervention is producing desired effects and weather changes in direction are needed. The job stress prevention process does not end with evaluation. Rather, job stress prevention should be seen as continuous process that uses evaluation data to refine or redirect the intervention strategy.[9]

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