Ergonomics and MSDs

1Deepa P, 2Cissy Shaji, 3Samir Nimkar

1Lecturer, 2HOD, 3Lecturer
1,2,3Department of Chemical Engineering, Bharati Vidyapeeth Institute of Technology, Navi Mumbai, Maharashtra, India

Abstract: Ergonomics is the study of worker in their working environment. Designing of everything which a person comes in contact in his working environment for eg-machines, tools, controls, equipment, process, layout, housekeeping etc. to increase efficiency of both man and the machine is the precise ergonomics approach. Less accidents, improved health and efficiency are the results of efficient ergonomics approach. Musculoskeletal disorder (MSDs) also known as repetitive motion injury which affect the muscles, nerves, tendons, ligaments, joints, cartilage, bones and spinal discs are the consequences of ergonomic injuries. Truly speaking individual risk factors or ergonomic risk factors contributes to MSDs. Studies reveals that they are the single largest category of workplace injuries.

Key words: Ergonomics, MSD

1. Ergonomics
1.1 Introduction
Ergonomics is the science of fitting a workplace to the user’s needs and requirement. It aims to increase efficiency and productvity and reduces accidents and discomfort. It also takes into account the need for different types of movements throughout the day instead of repetitive actions [1]. Ergonomics is about designing the working environment for the betterment of the people.

1.2 Importance
Ergonomics helps people to be more comfortable at work, reducing stress and fatigue or injury caused by incorrect positioning and repetitive tasks. Normally people do the work in an unhealthy way either due to ignorance or due to casual way of taking the things. When tasks are performed in this manner for a long time, it will cause headaches, neck pain, back discomfort, bursitis and tendon problems. When a work area is set up ergonomically, it reduces the likelihood of the above problems. Along with this, if proper training and health awareness is imparted to the workers; the working environment will improve which results in reduced injuries, physical and mental stress. Injuries and illnesses at work can be costly to both employees and the organization in terms of time and money. In addition, the organization will be losing the valuable service of an experienced employee. So now employers are giving more importance to ergonomics or to create worker friendly environment [2].

1.3 Goal
The goal of ergonomics is to prevent soft tissue injuries and musculoskeletal disorders (MSDs) caused by sudden or repetitive exposure to force, vibration, motion, and awkward posture. NIOSH ergonomists and industrial hygienists recommend creating an ergonomically sound work environment by designing tasks, work spaces, controls, displays, tools, lighting, and equipment to fit employee’s physical capabilities and limitations [3].

2. Musculoskeletal Disorders (MSDs)
Musculoskeletal disorders comprise severe and diverse conditions affecting bones, joints, muscles and connective tissues due to incorrect positioning and repetitive tasks. These disorders results in pain, discomfort and loss of function. Workers are exposed to the following risk factors at work, such as lifting heavy items, bending, reaching overhead, pushing and pulling heavy loads, working in awkward body postures and performing the same or similar tasks repetitively. These risk factors increase a worker's risk for injury or MSD. Work-related MSDs are among the most common reported causes of lost or restricted work time.

Examples of Musculoskeletal Disorders (MSDs) - Carpal tunnel syndrome, Tendinitis, Rotator cuff injuries (affects the shoulder), Epicondylitis (affects the elbow), Trigger finger, Muscle strains and low back injuries

2.1 High Risk Occupations for MSDs
Registered nurses, nursing assistants and psychiatric aides, fire-fighters and prevention workers, labourers and freight, stock and material movers, janitors and cleaners, heavy and tractor-trailer truck drivers, refuse and recyclable material collectors, maids and housekeeping cleaners, light truck or delivery services drivers, telecommunications line installers and repairers, bus drivers, production workers, police and sheriff patrol officers, heating, air conditioning, and refrigeration mechanics and installers, plumbers, pipefitters and steamfitters, maintenance and repair workers in general[4].

2.2 Prevention of Musculoskeletal Disorders at the workplace
Work-related MSDs can be prevented by ergonomics. Fitting a job to a person ie ergonomics helps lessen muscle strain, increases productivity and reduces the number and severity of work-related MSDs.
A safe and healthful workplace for the workers is the responsibility of the employers. MSDs at work place can be substantially reduced by applying ergonomic principles.

2.2.1 Elements of an ergonomic process
Following are the elements of an effective ergonomic process
Management Support - A strong and dedicated commitment by management is critical to the overall success of an ergonomic process. Management should define clear goals and objectives for the ergonomic process, discuss them with their workers,
assign responsibilities to designated staff members, communicate clearly with the workforce, increase awareness, and conduct training programs at regular intervals.

Involvement of Workers – Essence of a successful ergonomic process includes direct involvement of workers in worksite assessments, solution development and implementation. Workers can identify and provide important and useful information about hazards in their workplaces, assist in the ergonomic process by voicing their concerns and suggestions for reducing exposure to risk factors and by evaluating the changes made as a result of an ergonomic assessment.

Training - Training is the most important element in the ergonomic process which ensures that workers are aware of ergonomics and its benefits, become informed about ergonomics related concerns in the workplace, and understand the importance of reporting early symptoms of MSDs.

Identify problems- Another important step in the ergonomic process is the identification and assessment of ergonomic problems in the workplace before they result in MSDs.

Encourage early reporting of MSD Symptoms – This helps to prevent or reduce the progression of symptoms, the development of serious injuries, and subsequent lost-time claims.

Solutions to control hazards – MSDs at workplace can be reduced, controlled or eliminated by implementing the most appropriate and possible solutions

Evaluate Progress - To periodically assess the effectiveness of the ergonomic process and to ensure its continuous improvement and long-term success, established evaluation and corrective action procedures are required [5]

Conclusion
Tasks at workplace should be designed to limit the exposure to ergonomic risk factors. Engineering controls are the most desirable. Administrative or work practice controls may be appropriate in cases where engineering controls cannot be implemented or when different procedures are needed after implementation of the new engineering controls. When dealing with ergonomic hazards, personal protection solutions have only limited effectiveness.

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