

## I INTRODUCTION

***Safety is a state of mind - Accidents are an absence of mind.***

***Know safety - No injury, No safety - Know injury.***

***- Prof. Abdul Shukor***

India is a growing country, the world's most vibrant and largest democracy and an aspiring superpower. Occupational safety and health (OSH) for India is a 'developmental tool' and an empowering movement. Majority of Indian population is engaged in unorganized sector and resides in rural area; though the urban population has been on rise. Health at work and healthy work environments are among the most valuable assets of individuals, communities and countries. Health and safety of the employees are important aspects of an organization's smooth and effective functioning. Occupational safety and health is an area concerned with protecting the safety, health and welfare of people engaged in work or employment. The goal of all occupational safety and health programmes is to foster a safe work environment. High quality of work goes hand in hand with high employment participation. This is because the working environment plays a crucial role in enhancing the potential of the workforce and is a leading competitiveness factor.

Occupational safety and health can be important for moral, legal, and financial reasons. As a secondary effect, it may also protect co-workers, family members, employers, customers, suppliers, nearby communities, and other members of the public who are impacted by the workplace environment. It may involve interactions among many subject areas, including occupational medicine, occupational (or industrial) hygiene, public health, safety engineering, chemistry, health, physics, ergonomics, toxicology, epidemiology, environmental health, industrial relations, public policy, industrial sociology, medical sociology, social law, labour law and occupational health psychology (Harrington and Gill, 1990).

Thus occupational health and the well-being of working people are crucial prerequisites for productivity and are of utmost importance for overall socio-economic and sustainable development. According to WHO (1948) 'health is a state of complete physical, mental and social well being and not merely the absence of diseases or infirmity'. Occupational health hazard is concerned with health hazard in relation to work environment.

Occupational safety and health hazards are common in many economic sectors and affect large numbers of workers. Occupational health is an important strategy not only to ensure the health of workers, but also to contribute positively to productivity, quality of

products, work motivation, job satisfaction and thereby to the overall quality of life of individuals and society (WHO, 1995).

A comparative study on male and female workers between 30-35 years of age was conducted regarding occupational hazards in garment manufacturing units located in Ghaziabad. The total sample size was 110 which comprised of 55 men and 55 women. The finding shows that maximum (54.5 per cent) of male and (45.4 per cent) of female workers faced problems due to amount and intensity of light, majority of (49.0 per cent) men and (36.3 per cent) women get injured with machine needles. It was found that the poorly designed workstations, unsuitable furniture, lack of ventilation, inappropriate lighting, excessive noise and lack of personal protective equipment are the main causes of occupational hazards states Chandra & Parvez (2011). The main hazards of the study conducted by Kumar et al (2014) were noise, dust, fire and electrical hazards.

The research and regulation of occupational safety and health are a relatively recent phenomenon. India has 16 Laws related to working hours, conditions of services and employment. The major legal provisions for the protection of health and safety are: the Factories Act (1948) and the Mines Act (1952) ([www.dgms.net](http://www.dgms.net)). The Central Labour Institute, National Institute of Occupational Health, National Safety Council of India, Regional Labour Institutes and Non Government Organizations (NGOs) such as Indian Association of Occupational Health, also organize periodic short training courses on occupational health for industrial physicians, safety professionals and industrial managers. After prolonged deliberations, the Government of India approved the National Policy on Safety, Health and Environment at workplaces in February 2009 ([www.dgfasli.nic.in](http://www.dgfasli.nic.in)).

Textile industry is one of the oldest industries on the face of this world. It is as old as human civilization and is growing every other day. Textile products are a basic human requirement next to food. The textile chain from seed cotton to cotton-based textile and clothing manufactures has special importance for developing countries. India is one of the largest producers of textiles and garments. The potential size of the Indian textile and apparel industry is expected to reach US\$ 221 billion by 2021 (Technopak's Textile and Apparel Compendium, 2012). Textile industry has made a major contribution to the national economy in terms of direct and indirect employment generation and net foreign exchange earnings. The sector contributes about 14 per cent to industrial production, 4 per cent to the gross domestic product (GDP), and 17 per cent to the country's export earnings. It provides direct employment to over 35 million people. The textiles sector is the second largest provider of

employment after agriculture. Thus, the growth and all round development of this industry has a direct bearing on the improvement of the economy of the nation ([www.ibef.org](http://www.ibef.org)).

The vast pool of skilled and unskilled workers, availability of labour at low costs, strong base for production of raw materials characterize the textile industry in India. The increase in domestic demand and ability of the units in the industry to process small or customized orders are some of the advantages for the textile industry in India. The textile sector is highly diverse and has hand-spun and hand woven segments at one end of the spectrum, and capital-intensive, sophisticated and modern mills at the other ([www.dnb.co.in](http://www.dnb.co.in)).

Workers in the garment industry work in clothes designing, cutting or sewing services, and clothes wholesaling (Chan et al., 2002). Health risks in the garment industry include repetitive strain; dust from cloth pieces and, in the case of some dyes, exposure to poisonous chemicals (Laungaramsri, 2005). Due to the nature of these jobs, the prevalence of work-related musculoskeletal disorders (MSDs) has been high (Sarder et al., 2006). Punnett and Wegman (2004) describe that the Musculoskeletal disorders include a wide range of inflammatory and degenerative conditions affecting the muscles, tendons, ligaments, joints, peripheral nerves, and supporting blood vessels. These include clinical syndromes such as tendon inflammations and related conditions (tenosynovitis, epicondylitis, bursitis), nerve compression disorders (carpal tunnel syndrome, sciatica), and osteoarthritis, as well as standardized conditions such as myalgia, low-back pain and other regional pain syndromes not attributable to known pathology. Body regions most commonly involved are the low-back, shoulder, forearm, and hand, although recently the lower extremity has received more attention. Sarder et al. (2006) opined that the nature and severity of the disorders has been considered to be the results of the job characteristics - constrained and sustained work postures, highly repetitive actions, and strong visual demands among garment workers. The consequences are obvious from the ergonomics points of view - physical and emotional suffering of the workers, high worker compensation costs, decreased productivity and overall inefficiency.

Ergonomics is considered with making the workplace as efficient, safe and comfortable as possible. Effective application of ergonomics in work system design must achieve a balance between worker characteristics and task demands. This can enhance worker productivity, provide worker safety as well as physical and mental well-being and job satisfaction. Many research studies have shown the positive effects of applying ergonomic principles in workplace design, machine and tool design, and environment and facilities

design. However, there is still a low level of acceptance and limited application of ergonomics in industry, especially in developing countries. The main concern of work system design is the improvement of machines and tools. Inadequate or no consideration is given to the design of the work system as a whole. Neglect of ergonomic principles brings inefficiency and pain to the workforce. An ergonomically deficient workplace can cause physical and emotional stress, low productivity and poor quality of work. A workstation should be laid out such that it minimizes the working area so that while carrying out the operations, the worker uses shorter motions and expends less energy. This will reduce fatigue. Hence, application of ergonomics in the design of repetitive tasks, including redesigning workstations and tasks, would not only improve workers safety and work quality, but it would also reduce cycle time and thus improve worker productivity significantly (Shikdar and Hadhrami, 2005 and Shikdar and Das, 1995).

### **Research Problem**

Major occupational risks are accidents, pneumoconiosis (especially silicosis), musculoskeletal injuries, chronic obstructive lung diseases, pesticide poisoning, byssinosis, asbestosis, noise induced hearing loss and workplace stress. Occupational hazards are often encountered in industry, agriculture, mining and other working environments. The major categories of environmental stress for the worker are chemical agents; physical agents and conditions; biological agents and conditions; and psychosocial factors. These may act either singly or in combination. Occupational accidents result from the joint action of both environmental and human factors (Jaiswal, 2007).

Few articles relevant to accidents and occupational illnesses have been discussed in the Review of Literature under the heading Studies conducted and sub heading Occupational health hazards. The Director General of the Factory Advisory Services and Labour Institutes (DGFASLI) reported 1,509 fatal and 33,093 non-fatal injuries in 2009, using records from registered factories which employed about 5 per cent of total workforce.

According to International Labour Organization (ILO), every year more than two million people die from occupational accidents or work-related diseases. More than 1000 workers die every day. By conservative estimates, there are 270 million occupational accidents and 160 million cases of occupational disease. Occupational injuries alone account for more than 10 million Disability-Adjusted Life Years (DALYs). People in developing countries bear more than 80 per cent of the global burden of occupational diseases and injury.

The ILO's estimate is really just the tip of iceberg, because the number of work-related diseases in developing countries is much higher in reality than the numbers that are reported ([www.iepkc.org](http://www.iepkc.org)). The occupational safety conditions vary enormously between countries, economic sectors and social groups. Deaths and injuries take a particularly heavy toll in developing nations, where large numbers of people are engaged in hazardous activities such as agriculture, textile, construction, logging, fishing and mining. Developing countries have more fatal accidents than industrialized nations.

In many rapidly developing countries like India, proper occupational hygiene and posture analysis methods are often neglected. Proper sitting arrangements and work environment are seldom provided. The workers, being economic migrants, accept adverse conditions as a part of the job and mostly work in bad posture. The small and medium scale textile enterprises are much greater in number in Indian economy and these are the places where work posture analysis is mostly neglected. Repetitive processes and material handling are the major problems in the manufacturing units. Thus, to improve the efficiency of the workers, their posture need to be assessed and corrective measures should be adopted to avoid the musculoskeletal disorders. Assessment of exposure levels to MSD risk factors can be an appropriate base for planning and implementing interventional ergonomics programmes in the workplace (Singh, 2010). Also as pointed out by Kelly et al. (1992), MSDs occurs among sewing machine operators due to poor design and maladjusted workstations in garment manufacturing units. Ergonomic interventions including redesign and proper adjustment of workstations, use of ergonomically designed seating, and training in low-risk methods and postures substantially reduce the complaints. Other innovations in equipment, job, and organization design, with potential to reduce ergonomic problems, should be considered.

Long hours of repetitive work often lead to injuries which then go undiagnosed. Many of the most pressing health issues for garment workers stem from the endless hours they spend working. Poor ergonomics combined with long hours and unrelenting pressure to meet production quotas lead to eye strain, fatigue and debilitating overuse injuries that often go untreated.

Other than poorly designed workstation and tools, constant inhalation of cotton dust causes various effects on respiratory system in garment industry. The relation between exposure to cotton dust and respiratory disorders is well illuminated; they include mainly the bysinosis, respiratory tract irritation and chronic obstructive pulmonary disease (COPD)

producing larger rate of decline in pulmonary functions (Suryakar et al., 2010). Studies carried out by Garshick et al. (1996) and Viegi and Di Pede, (2002), have reported that there is an increased risk of chronic bronchitis in textile and cotton workers.

Garment workers constitute a lion's share of the total labour force in India, which bring most of the country's foreign currency. But workers are exploited easily due to lack of technical knowledge and training, absence of health facilities and safety measures in workplace. Health and safety conditions in many garment factories are extremely inadequate (Nahar et al., 2010). The factors like water supply, sewage and waste disposal, nutrition and education, and the conditions prevailing in their place of work influence the health of the industrial workers. High quality of work goes hand in hand with high employment participation (Jaiswal, 2007). There is strong need to create OSH awareness among all stakeholders such as lawmakers, employers, employees, contractors and the general public. There is an urgent need to change the mindset of workers and employers through OSH education.

Safety and security for garment worker is a burning issue. The present study was undertaken to study the prevailing situation in garment industries and to educate them on the need for occupational safety and health with the following objectives to:

- Collect baseline information on the nature and type of activity performed by workers and the ergonomic condition of the workplace in selected garment industries
- know the association of knowledge, attitude and practice regarding occupational health problems among garment workers
- Assess the relationship between worker, work environment and machineries and tools used by the workers
- Identify the hazards and risks faced by the workers in the workplace
- Creating awareness on occupational safety and health hazards and its prevention
- Fabricate and implement ergonomically designed stitching chair, and
- Evaluate the effectiveness of intervention strategies in promoting occupational health and safety.

## **Hypotheses**

1. There is no relationship between knowledge, regarding the hazards and the attitude of the workers and the practices followed by them.
2. There is no relationship between the years of experience and development of COPD and respiratory symptoms in the experimental group.
3. There is no association between the incidence of COPD and risk factors in the control group.
4. Conventional checking table and conventional stitching chair used in the garment industry do not cause Musculoskeletal Disorders.
5. There is no change in the physiological function of the heart with regards to the usage of the conventional checking table and conventional stitching chair.

## **Scope of the study**

It mainly focuses on the following concepts:

- The study follows the theory stated by Dan Petersen (1988) management should establish a comprehensive safety policy and it should be clearly defined. Employees do not receive proper orientation and are not given sufficient safety training about the occupational health and safety. So to create awareness regarding safety measures among owners or management of the garment industries this study was initiated.
- Workers should know about their rights in procuring a worker friendly environment that provides them hazard free life, healthy life styles and safe atmosphere.
- Workers should be aware of their responsibilities and duties towards the utilization of the ergonomic facilities provided to them. This ensures a clean and safe work environment enabling occupational safety.
- Importance of standardized ergonomic furniture should be emphasized.