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Occupational Health Hazards And Control Measures In Textile Industry

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ABSTRACT

The textile industry is a significant sector globally, employing millions of workers. However, it is also associated with a range of occupational hazards that can have severe consequences for worker's health and well-being. This review aims to summarize the current state of knowledge on occupational hazards in the textile industry, including exposure to cotton dust, chemicals, noise, and physical trauma. The review highlights the risks of respiratory diseases, skin problems, hearing loss, and musculoskeletal disorders associated with textile work. Furthermore, it discusses the socio-economic and psychological impacts of occupational hazards on textile workers. This review article scrutinizes the occupational health and safety (OHS) paradigm in the textile industry. Not with standing its status as a significant global employer, the textile sector is plagued by a multitude of occupational perils and vulnerabilities. The article furnishes an exhaustive synopsis of the hazardous exposures commonly faced by textile workers, including sonic disruptions, atmospheric pollutants, and noxious chemical inhalation, as well as musculoskeletal and psychosocial strain. Moreover, the article probes tactical interventions that organizations can deploy to enhance workplace OHS, including hazard recognition, risk evaluation, and mitigation strategies, while also analyzing the relevant statutory and regulatory frameworks devised to safeguard workers' well-being and security. The review concludes by emphasizing the need for effective occupational health and safety measures, including hazard identification, risk assessment, and control measures, to protect the health and well-being of textile workers.

Keywords: Occupational Hazards, Textile Industry, Workers, Remedial Measures

1. INTRODUCTION

The textile industry encompasses various materials crafted from fibres, yarns, and fabrics. Historically, revolutionary innovations spearheaded the industry's origins, enabling mass production of textiles and clothing. The Indian textile industry stands as a cornerstone of the nation's economy, playing a pivotal role in both employment generation and export earnings. Its rich heritage, coupled with technological advancements, has positioned India as a global textile hub (Kausher, 2024).

Occupational health and safety plays an important part in the textile process. To improve the health and safety of Indian workers, occupational health and safety is developing in the textile sector. When compared to other technical sectors, the textile industry presents the greatest risk. Because of the lack of education among workers, the textile industry's promotion of occupational health and safety, and the management's lack of focus, people are ignorant of health and safety. It's critical that employees understand the many occupational hazards in the textile sector in order to prevent health issues.

2. OCCUPATIONAL HAZARDS

The safety, welfare, and well-being of employees while they are at work are the main concerns of occupational health and safety (OHS). Facilities are required by law to provide a safe working environment for their employees. OHS requires that any health issues that workers may have at work or as a result of their employment be prevented and addressed.

Workers' occupational safety and health (OSH) conditions in the apparel manufacturing industry are steadily getting worse and more complicated. The biggest risks in this sector are usually indirect risks, which result from repetitive tasks and have a lasting effect, as opposed to direct hazards. Physical, ergonomic, psychological, biological, and chemical risks are the five categories into which the International Labor Organization divides OSH hazards. The OHS risks connected to the textile sector are listed below. (Gamage et al., 2023)

2.1 PHYSICAL HAZARDS

Physical hazards involved in various textile sectors like Ginning Unit, spinning, weaving, Garmenting and printing are,

A. Noise Hazard: In certain yarn manufacturing methods, noise might be an issue. Higher rotational and traveling speeds in machine parts cause noise emissions to increase nonlinearly. Noise has caused by Simple gear, Continuous gear train, Chain drive, Bevel drive, Worm and worm wheel, Variable drive. Which have the consequences of hearing loss (AnithaRajathi, n.d.).

Remedial measures: For solve this hazard are the machine and silencer must remain isolated, ring frame's inverted drive control noise, lubricating control noise, proper maintenance, rotation of personnel to reduce exposure time and changing job schedules.

As equipment is replaced or repaired, appropriate noise-reduction steps should be taken. In case the noise level cannot be controlled, workers should be provided with earplugs so that exposure to noise can be reduced.

B. Dust Hazard: The spinning process exposes large amounts of cotton dust. In cotton industry there are numerous diseases occurred due to dust. One of the occupational diseases happening in the mill was asthmatic and the other diseases are primary skin cancer, Bronchitis and Deafness byssinosis (brown lung), Bronchitis and Emphysema. Byssinosis is due to inhalation of cotton fibre dust over long periods of time. The symptoms include a persistent cough that worsens over time, leading to emphysema and chronic bronchitis. Both acute and chronic bronchitis are possible. Usually lasting only a few days, acute bronchitis is followed by full recovery. The sickness is also influenced by dust and fames. Emphysema is typically linked to a lengthy history of bronchitis; it damages the air sacs, causing them to swell excessively and eventually burst. As a result, lung efficiency declines. Majority of the employees says that there are accidents in the mill and they say there is no medical facilities provided in the mill (Denesh et al., 2024).

Remedial measures: Dust collector system(Kumar, n.d.)

C. Light: Lighting Hazard have caused by high beam and low beam of light. Which have the effects of eye strain, glaring and irritation of eye.

Remedial measures: Implementing proper color temperature in lighting fixtures and utilize task-specific lighting (Kumar, n.d.)

D. Heat: The spinning industry occasionally needs air that is extremely hot and artificially humid. The majority of our nation's industries frequently face heat-related hazards. The primary issue facing the cotton textile business is heat stagnation. Heat can result in weariness, heat cramps, heat strokes, burns, and an increased risk of accidents. In extreme circumstances, nausea and vomiting may result. The majority of textile workers lack heat control equipment in their workspaces

Remedial measures: Install local exhaust ventilation (LEV) systems. Provide employees with adequate personal protective equipment (PPE) which include items like gloves, aprons, face shields, and respirators(Kumar, n.d.)

E. Fire: Certain combustible dyestuffs and flammable solvents employed in the processes are the fire hazards present in a dye factory. In printing, the thickening systems contain up to 40% solvents and are highly flammable. Workplace dangers that involve flames, raise the possibility of an uncontrolled fire, or intensify a fire if one does start are known as fire hazards. If the fibres are flammable, the considerable amounts of lint, dust, and flying fibres produced by weaving could provide a fire threat.

Remedial Measures: Store the dye stuffs in safe place and maintain properly.(Kumar, n.d.)

F. Cold: Immersion foot & chilblains erythrocyanosis are significant risks linked to cold.

G. Lifting Heavy weight: One of the main textile manufacturing techniques is weaving. The risk to worker safety posed by weaving is only mild. Seventy-six percent of workers are required to stand for eight to

twelve hours a day, which puts them at risk for various types of joint and muscle pain. Some occupational diseases that have been linked to heavy weight lifting and moving heavy cloth rolls among textile workers include musculoskeletal disorders such as carpal tunnel syndrome, forearm tendinitis, bicapital tendinitis, lower back pain, epicondylitis, neck pain, shoulder pain, and osteoarthritis of the knees

H. Air emissions: During drying and curing, the solvents in this print system will be flashed off from the oven.

I. Vibration: Induce injuries of the joints of the hands, elbows and shoulders.

J. Improper ventilation: The workplace should have adequate ventilation.

K. Electrical Hazard: Accidents caused by electricity can be divided into three parts:

i) Current flowing through the human body

Can cause electric shock with a harmful effect on the internal organs and their proper function, most vulnerable are cardiac activities. Weak current mostly causes functional disorders, while heavy current causes human tissue burns, especially if the current goes in and out of the body

ii) Contact with hot and harm substances

iii) Secondary Hazards

Remedial Measures: It must be installed and designed to operate safely. Regular inspections are unquestionably necessary. It shall be fixed carefully and for safe further operation. Avoid avoiding the protective gadget at all costs. Electrical equipment should be of certified flameproof construction (Electrical Hazards in the Textile and Garment Industry Practical Solutions for Avoiding Danger, n.d.)

2.2 ERGONOMIC HAZARDS

The majority of these facilities in developing nations have unsafe and unhealthy working conditions for their employees. Ergonomic conditions which include Badly designed machinery, Repetitive nature of works, Awkward postures, Lifting problems, Prolonged working hours and Inadequate circulation spaces. Continuous labour and inappropriate workstations are among the causes of repetitive strain injuries (wrist, neck, shoulder, knee, leg, hands, and angle). To address this issue, workers should follow suitable working procedures and prioritize ergonomics. (Gamage et al., 2023)

Remedial Measures: To prevent musculoskeletal strain, the heights of the tables and the workers' seats should be properly aligned.

2.3 PSYCHOLOGICAL HAZARDS

These risks could result from insecurity, emotional strain, frustration, or a lack of job fulfilment. bad interpersonal interactions. It might result from the employees' incapacity to to coexist peacefully with his surroundings at work and at home. These elements could jeopardize the employees' mental and physical well-being. These days, psychological risks are becoming more significant than chemical or physical ones. It has long been known that people who are exposed to dust, noise, and

other adverse environments for extended periods of time experience varying degrees of health deterioration. (Sobha, 2006)

Remedial Measures: Personal protective devices are playing a vast role in the occupational health and safety society. Personal protective equipment protects the workers from many diseases at the workplace. Workers feel relaxation and safety by using the protective dress during the manufacturing process (Shaikh et al., 2018)

2.4 MECHANICAL HAZARDS

About 10% of industrial accidents are attributed to mechanical reasons, which can include projecting machinery, moving pieces of machinery, fire, explosion, and electricity.

Remedial Measures: It is important to earth (ground) machines to avoid the accumulation of static charge, which could cause disastrous sparks.

2.5 CHEMICAL HAZARDS

The textile industry uses a wide range of chemical compounds, including as dyes, solvents, optical brighteners, agents that resist creases, flame retardants, heavy metals, insecticides, and antimicrobials. They are employed in spinning, weaving, slashing/sizing, printing, bleaching, finishing, washing, and dry cleaning. Textile fibres, reactive dyes, synthetic fibres, and formaldehyde are a few examples of respiratory and skin sensitizers that are found in the textile business. One industry with a higher risk of cancer has been identified as the textile business. Women are more likely to get bladder, laryngeal, and nasal cancers, according to several studies (Tregenza, 2006).

The key area of concern at the bleaching and dyeing unit was the improper storage and handling of chemicals posing a risk of spillage and direct exposure to harmful chemicals and fumes and, thus, it presented a high risk of development of tumors and skin related problems within the workforce (Saleem Ahmad et al., n.d.).

Remedial Measures: Adequate LEV should be used to keep exposures to potentially harmful chemicals and solvents below the applicable maximum permissible limits.

2.6 BIOLOGICAL HAZARDS

Workers may be exposed to biological agents like anthrax, clostridium tetani, the cause of tetanus, and Coxiella burnetti, which causes Q fever, during certain tasks like carding and willowing. Allergies and respiratory conditions can arise from biological agent exposure. (Sobha, 2006).

CONCLUSION

In every industry, safety and health precautions are crucial. Employee awareness of the several occupational hazards in the sector is crucial. At the same time, management must take the required actions to shield employees from potentially dangerous circumstances.

RECOMMENTATION

This study makes several crucial recommendations for the textile sector. Machine maintenance ought to be required in order to lower noise levels at work. Every employee is treated equally. Every industrial organization must have a safety officer. Without a safety officer on duty, no industry can function. The government is responsible for staying up to date on any modifications to the records. From the organization's perspective, every employee should be treated equally. On the production line, industries should supply a suitable and practical protective garment. To identify the risks and remove them from the workplace, routine organizational inspections should be set up. The government should take a stance on this matter since it is crucial for regulatory agencies to identify potentially dangerous companies in order to protect workers' health. All employees should be required to wear personal protection equipment and undergo a pre-employment medical assessment.

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