

OCCUPATIONAL HEALTH AND SAFETY IN TEXTILE INDUSTRIES

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Abstract - A key role in the textile process is occupational health and safety. In the textile industry, occupational health and safety is evolving to promote the health and safety for workers in India. The textile industry poses the highest risk compared to the other engineering industries. People are unaware of health and safety as workers are uneducated, promoting occupational health and safety in the textile industry and so little attention to management. To prevent the health problems of workers in the textile industry, it is important for workers to be aware of the various occupational hazards in the industry. Management must take the necessary steps to protect the workers from the hazardous conditions.

Key Words: Occupational health, Hazards, Health risks, Working conditions, Control measures

1. INTRODUCTION

A textile industry in India plays an important role in the economy of the country and provides employment in both urban and rural area. These processes involved in the apparel manufacturing and other finished textile products such as apparel have changed little inception. Despite the change in organization processes and some other technological advances in the machines, the health and safety risks in the industry remain the same. The textile industry has many units involved in the process of spinning, dyeing, printing, finishing and so on. These are needed to convert fiber into a finished garment [1]. There is lots of health and safety problems are associated with the textile industry.

2. OCCUPATIONAL HEALTH

People health is related to the occupation. Occupational health and safety is a complete part of the common notion of health that is a part of socioeconomic development. Occupation health affects everyone directly or indirectly. Depending on their occupation the industrial workers may be affected to the below types of hazard [2, 3].

2.1. PHYSICAL HAZARDS

Heat, cold, noise, vibration, temperature, humidity, radiation (non-ionization), improper ventilation, fire. [2]

2.2. CHEMICAL HAZARDS

Dust, dyes, vapors, sparks, gases, solvents, antimicrobial agents, flame retardants metals and their alloys [4].

2.3. BIOLOGICAL HAZARDS

Hazards due to contact with living organisms or their by product (e.g. molds, bacteria, HIV, grain dust). Anthrax, which causes tetanus, bacteria and various blood borne disease.

2.4. MECHANICAL HAZARDS

Slipping out of a wet work environment, workers are hit by objects, such as moving machine parts and tripping hazards.

2.5. ERGONOMIC HAZARDS

Improper manual material handling method, poorly designed work practices and tasks, long sitting, unsafe work places, continuous work.

2.6. PSYCHOLOGICAL HAZARDS

Various aspects of work organization (system) such as increased workload, night shift, and no employee motivation, work cycle, over time.

2.7. ELECTRICAL HAZARDS

Improper earthing and isolation, usage of the old wire, high voltage and contact with live electrical equipments [5].

3. OCCUPATIONAL HEALTH IN TEXTILE INDUSTRIES

After farming, the textile is the 2nd largest industry, in terms of number of workers are employed in the industry. In textile industry is classified into 3 sectors: spinning, weaving and finishing. In textile industry there is lot of safety and health problems involved. Three factors are used to promote the safety such as probability of occurrence of the injury or illness, severity of the cases, preventive and corrective measures [7,8]. Unsafe act (operates the machines without guards, runs at unsafe speed), Unsafe conditions (high noise, improper

ventilation, improper illumination), Improper material handling these are caused by the accidents.

3.1. OCCUPATIONAL HEALTH HAZARDS IN VARIOUS TEXTILE UNITS

3.1.1 PRODUCTION AND GINNING UNIT

Health hazards: Hand/fingers injury, back/spine, eye, leg, foot/toes, and arm/shoulder, leg and head injuries. Fire is caused by electrical equipments, manmade behavior and spark from the machine is one of the major hazards in the ginning process [2].

3.1.2 YARN MANUFACTURING UNIT

Health hazards

Machinery accidents: All types of textile machinery can cause accidents due to machinery. Accident occurs transmission machine parts such as belts, pulleys, gears, shafts and other revolving parts.

Exposure to cotton dust: High amounts of cotton dust are exposed in spinning process. They also exposed to pesticides and soil. Workers exposed to cotton dust and other particles can cause respiratory problems. It will result in fatal disease of byssinosis, it known as brown lung. The symptom of this disease includes chest tightness, coughing and shortness of breath[9].

Noise hazard: Noise is an unwanted signal. Excessive noise levels are damage the eardrum when exposed to every loud and sudden noise and the pair cells in the inner ear are chronically damaged. Prolonged to exposure to noise of certain frequencies are leads to hearing loss. Fatigue, absenteeism, annoyance, anxiety, pulse rate changes, blood pressure, and blood vessels are other problems.

Heat Stress: The spinning industry sometimes requires high levels of temperature and artificial humidity of the air. Heat stroke or heat exhaustion are both signs of heat stress. Symptoms includes headache, dizziness and in severe cases, it will happen nausea and vomiting.

3.1.3 SYNTHETIC FIBER PRODUCTION UNIT

Health hazards: A large amount of toxic and flammable materials are used to make synthetic fiber. So, it will result in toxic and health hazard. Bladder cancer occurs due to azo dyes used in this unit and it can cause allergic reactions and skin reactions[10,11].

3.1.4 WEAVING UNIT

Health hazards

Falls: Oil, grease, water spots and machine parts of objects on the floor that cause workers are falls. Remove the spills immediately. Good housekeeping is essential to prevent falling hazards.

Machinery hazards: It must be guarding of all power transmitting devices and other nip point and point of operation. High speed equipments can cause repetitive motion trauma it is a type of health hazard in textile industry. High speed equipments are should be fenced and effectively guarded.

Ergonomic hazard due to improper activities: Occupational diseases Musculo-skeletal disorders (MSD) like carpel tunnel syndrome (CTS), cumulative trauma disorder (fig.1) (CTD), ligament strain, neck and shoulder pain etc[10].

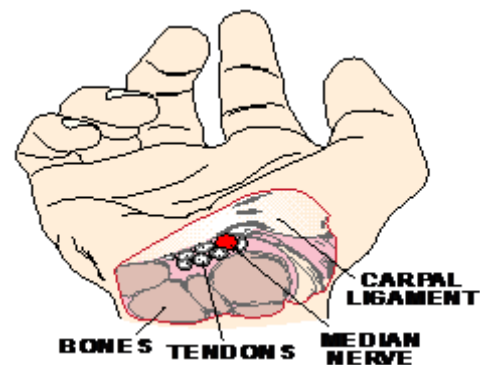


Fig 1- Carpel Tunnel Syndrome

Occupational disorders that involve muscles, tendons, joints, blood vessels and nerves. These types of occupational disease are due to improper lifting the objects and handling heavy cloth rolls.

Fire hazards: Weaving process involves the large amount of dust, lint and flying fibers. If the fibers are the ordinary combustible materials these will identify the fire hazards. Provide dust collection system to control the fibers and other dusts [1].

3.1.5 DYEING, PRINTING AND FINISHING UNIT

Dyeing unit

Dyeing process involves mixture of chemicals between dyes and fabric fibers.

Hazards in dyeing process

Fire hazards: Most of the dye work is easily flammable solvents used in the processes. Therefore, proper storage must be provided.

Chemical hazards: Hypochlorite solution is used for bleaching and bleaching agent is gaseous chlorine which releases the chlorine and can cause skin and eye irritation and lung inflammation. Burn injury and scalds are result in use of alkalis and acids and lots of dyestuffs are skin irritants it can cause dermatitis [3].

Printing unit

Thickened with starch the dye or pigments or made into emulsion. This emulsion or paste take up by the printing the material in engraved cylinders [11].

Printing hazards

Fire hazard: The thicken system contains up to 50% and are highly inflammable materials.

Sludge problems: Formaldehyde is a sensitive and irritant therefore it causes irritation to the eye and skin and difficult to breath [12].

Finishing unit

Finishing is the last manufacturing process before the fabrication. Without the use of chemicals to change the structure of a fabric in mechanical finishing process.

Health hazards: Noise, temperature, moving parts of the nip points. Usage of the formaldehyde for finishing the fabric it can causes the blood cancer, brain cancer and respiratory problems.

4. PREVENTIVE MEASURES IN TEXTILE INDUSTRIES

4.1. PHYSICAL HAZARDS

Hazard: Noise (Noise induced hearing loss - NIHL). It will result in tinnitus.

Control measures: Proper maintenance of the equipment (lubrication) to control noise, increase the distance between source and receiver, enclosures – isolating the worker, rotation of personnel to reduce exposure time, changing job schedules [14].

Hazard: Fire causes the loss of life and damage to the equipment. Welding operation and electrical short circuit causes the fire.

Control measures: Proper housekeeping, only authorized person do the work, provide circuit breakers.

4.2. CHEMICAL HAZARDS

Hazard: Dust causes the respiratory problem (byssinosis-lung disease).

Control measures: Provide dust collector system, wearing proper PPE [1].

4.3. ERGONOMICAL HAZARDS

Hazard: Lifting heavy object without proper lifting principle and it cause Musculo-Skeletal Disorder, Repetitive Motion Injury [13].

Control measures: Always keeps your back straight when lifting equipments, proper work design end tool design, use lifting vehicles (forklift, Trolleys etc.)

4.4. PSYCHOLOGICAL HAZARDS

Hazard: Stress to the worker (repetitive jobs, night shift and over time)

Preventive measures: Achievable target will be determined, provide a rest cycle [15].

4.5. ELECTRICAL HAZARDS

Hazard: Electrical shock will occur due to improper earthing and old wires.

Control measures: Eliminating the improper earthing and avoid loose connections, all wires are should be in good condition and avoid temporary connections.

5. RESULTS AND DISCUSSION

Textile industry is one of the hazardous industries because all hazards are involved in this industry. Control of risk or hazard involves the training the workers, controls the risk, motivate the workers, identify the probable cause and reduce these risks and provide all recommendations and should take preventive and corrective actions.

6. CONCLUSION

Due to lack of education and inadequate training, workers are unaware of health and safety. Therefore, encouraging the workers to be aware of occupational health and safety the use safety measures and then only achieving the health and safety workplace environment. To create the health and safety standards in textile industries through hierarchy of controls is elimination, replacement, engineering controls and administrative controls and personal protective equipments.

REFERENCES

- [1] Sudha Babel and Meenaxi Tiwari, "Occupational health hazards in textile industry", Asian journal of home science, Vol. 9, pp. 267-271, 2014.
- [2] Neelam singh, "Safety and health issues in workers in clothing and textile industries", International journal of home science, Vol. 3, pp. 38-40, 2016.
- [3] Megha Bansal, Rajesh Kumar Yadhav, "Occupational health hazards and awareness of occupational safety among workers of textile dyeing industries in Jaipur", International journal of Environment, Science and Technology, Vol. 2, pp. 30-38, 2016.
- [4] Sudha Babel, Rupali Rajvanshi and Sangeeta Sharma, "Occupational hazards faced by spinning mill workers", Asian journal of home science, Vol. 9, pp. 572-575, 2014.
- [5] Jagatheesan P, Satheeshkumar P, Prabu R, Sirajudeen I and Anbalagan M, "Occupational health and safety in manmade spinning industry", International journal of innovation research in science, engineering and technology, Vol. 6, pp. 154-158 2014.
- [6] Kane C D, "Environmental and health hazards in spinning industry and their control", Indian journal of fiber and textile research, Vol. 26, pp. 39-43 2001.
- [7] Golam Kibria M D, "Identifying and eliminating industrial hazards in RMG industries", International journal of scientific research engineering and technology, Vol. 3, pp. 159-166, 2014.
- [8] Akarslan F and Demiralay H, "Effects of textile materials harmful to human health", International journal of computational and experimental science and engineering, Vol. 128, pp. 407-408, 2015.
- [9] Mehdi GHASEMKHANI, Masaharu KUMASHIRO and Mansour REZAEI, "Prevalence of Respiratory symptoms among workers in Industries", Industrial Health, Vol. 3, pp. 218-224, 2006.
- [10] Rashmi Jain and Radha Kashyap, "Exploring the working conditions in apparel export industries of Jaipur", International journal of science and research, Vol. 4, pp. 444-449, 2015.
- [11] Damanjot Singh Lail, Paramjeet Singh Bilga and Munish kumar, "Qualitative study of occupational health hazards in dyeing industries", International journal engineering technology, management and applied sciences, Vol. 4, pp. 138-142, 2015.
- [12] Anitha Rajathi V M and Pavithra P, "Health and safety hazards caused by textile industry", International journal of advance research and innovative ideas in education, Vol. 3, pp. 1288-1292, 2017.
- [13] Padmini D S and Venmathi A, "Unsafe work environment in garment industries", Journal of environment research and development, Vol. 7, pp. 569-575, 2012.
- [14] Jimky Leilanie Lu, "Occupational hazards and illnesses of Filipino women workers in export processing zone", International journal of occupational safety and ergonomics, Vol. 14, pp. 333-342, 2008.
- [15] Kassu Jilcha and Daniel Kitaw, "A literature review on global occupational safety and health practice and accidents severity", International journal for quality research, Vol. 2, pp. 279-310, 2016.