



# International Journal of Home Science

ISSN: 2395-7476  
 IJHS 2016; 2(3): 38-40  
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 www.homesciencejournal.com  
 Received: 11-07-2016  
 Accepted: 12-08-2016

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## Safety and health issues in workers in clothing and textile industries

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### Abstract

Textile industry in India contributes a lot to the growth of Indian economy and plays an important role in providing the employment to the rural and urban population in India but it fails to foster education and health as key component of human development. There are different hazards faced by the workers in textile industry such as exposure to cotton dust, exposure to chemicals, noise and ergonomics issues etc. There are also some factors, which are responsible to create the hazards in the working environment I.e. job strained, improper use of personal protective equipment stress, unhealthy working environment and poor working conditions etc. Most of the workers are illiterate and do not know that what protective measures should be adopted for their jobs. To prevent the health issues of workers in industries it is essential that the workers be aware of the various occupational hazards in the industry. It is also necessary that the management should take the necessary steps to protect workers from potential hazardous situation.

**Keywords:** Textile, health, workers, hazards, industry, safety

### Introduction

Textile sector in India plays an important role in the country's economy; providing employment to a significant population in rural and urban area. The processes involved in the production of clothing and other finished textile products have changed little since the inception of the industry. Although the organization of the production process has changed, and continues to change, and some technological advances have upgraded machinery, many of the safety and health hazards in the industry remain the same. The textile industry consists of a number of units engaged in spinning, weaving, dyeing, printing, finishing and a number of other processes that are required to convert fibre into a finished fabric or garment. There are several safety and health issues associated with the textile industry. This article aimed at developing a framework for understanding risks to textile workers resulting from lack of health and safety standards in industries.

**Table 1:** summarizes the spectrum of occupational diseases which may be seen in the clothing and finished textile industry.

Condition	Exposure
Musculoskeletal disorders	
Carpal tunnel syndrome, forearm tendinitis, De Quervains tendinitis, epicondylitis, bicipital tendinitis, rotator cuff tears and tendinitis, trapezius spasm, cervical radiculopathy, low-back syndrome, sciatica, disc herniation, osteoarthritis of the knees	Force Repetition Lifting Non-neutral postures Prolonged sitting
Asthma	Formaldehyde Other fabric treatments Heated plastics Dust
Cancer	
Bladder cancer	Dyes
Lung, nasopharyngeal cancer	Formaldehyde
Hearing loss	Noise
Skin	
Contact and irritative dermatitis	Formaldehyde, textile dyes
Lead poisoning	Lead

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Musculoskeletal disorders. Garment production involves the performance of monotonous, highly repetitive and high-speed tasks, often requiring non-neutral and awkward joint postures. These exposures place garment workers at risk of developing WRMDs (work related musculoskeletal disorders) of the neck, upper extremities, back and lower extremities (Andersen and Gaardboe 1993; Schibye *et al.* 1995). It is not uncommon for garment workers to develop multiple WRMDs, often with both soft-tissue disorders, such as tendinitis, and concomitant nerve entrapment syndromes, such as carpal tunnel syndrome (Punnett *et al.* 1985; Schibye *et al.* 1995).

Sewing machine operators and hand sewers (sample-makers and finishers) perform work which requires repetitive hand and wrist movements, typically performed with non-neutral postures of the fingers, wrist, elbows, shoulders and neck. Therefore, they are at risk for developing carpal tunnel syndrome, ganglion cysts, forearm tendinitis, epicondylitis, shoulder disorders including bicipital and rotator cuff tendinitis, rotator cuff tears and neck disorders. Additionally, sewing machine operation typically requires prolonged sitting (often in seats without backrests and in workstations that necessitate leaning forward from the waist), intermittent lifting and repetitive use of foot pedals. Thus, sewing machine operators may develop WRMDs of the low back and lower extremities.

Cutters, whose work requires lifting and carrying of fabric rolls as well as operation of hand-held or computer-operated cutting machines, are also at risk for development of musculoskeletal disorders of the neck, shoulder, elbow, forearm/wrist and low back. Pressers are at risk for developing tendinitis and related disorders of the shoulder, elbow and forearm, and may also be at risk for developing related nerve entrapment disorders.

**Exposure to cotton dust:** The workers engaged in the processing and spinning of cotton are exposed to significant amounts of cotton dust. They are also exposed to particles of pesticides and soil. Exposure to cotton dust and other particles leads to respiratory disorders among the textile workers. The fatal disease of byssinosis commonly known as brown lung, is caused among people working in the textile industry on account of excessive exposure to cotton dust. The symptoms of this disease include tightening of the chest, coughing, wheezing and shortness of breath.

In the year 1938 in USA, it was estimated that about 35000 people had already been affected by the disease, while 100000 other people were at risk of contracting it. Hence the Occupational Safety and Health Administration i.e. OSHA made it compulsory for employers in the textile industry to protect their workers from over exposure to cotton dust and its evil effects. The OSHA determined certain guidelines which are applicable to all private employers in the US textile industry.

OSHA has laid down a Cotton Dust Standard with a view to reducing the exposure of the workers to cotton dust and protecting them from the risk of byssinosis. It has set up Permissible Exposure Limits (PELs) for cotton dust for different operations in the textile industry. This standard has helped bring down the rate of occurrence of byssinosis significantly. Different states might adopt different standards for occupational safety and health; however, in those states where there are no standards fixed by the State, the Federal standards are accepted. The OSHA Cotton Dust Standard was amended in the year 2000, which exempted a method of washing cotton from the rule.

A study conducted by R. Steinberg, J. Hannak and K. Balakrishnan regarding textile units in India revealed that pulmonary function in textile workers decreased significantly with exposure to cotton dust over a long period of time. Another study conducted on textile units in Mumbai, India indicated an 11-33% incidence of chronic bronchitis in textile workers. Another study revealed an increase in the rate of occurrence with an increase in exposure to cotton dust.

Studies have revealed that acute respiratory diseases are more common among the children working in carpet weaving units in Jaipur as compared to other children in the same city. The prevalence of respiratory diseases among child textile workers was 26.4%, while it was 15.2% among other children. Experts believe that this is on account of high exposure to cotton dust.

**Exposure to chemicals:** Workers in the textile industry are also exposed to a number of chemicals, especially those engaged in the activities of dyeing, printing and finishing. Chemicals based on benzidine, optical brighteners, solvents and fixatives, crease-resistance agents releasing formaldehyde, flame retardants that include organophosphorus and organobromine compounds and antimicrobial agents are used in textile operations.

Studies have revealed links between exposure to formaldehyde and nasal and lung cancer as well as to brain cancer and leukemia, which can be fatal. In the long run, exposure to formaldehyde could lead to respiratory difficulty and eczema. Contact of the chemicals with skin as well as inhalation of the chemicals can lead to several serious health effects.

A study conducted in USA revealed a correlation between the presence of cancer of the buccal cavity and pharynx and occupation in the textile industry. Another study revealed that textile workers were at high risk for developing cancer of the stomach while another study indicated a low degree of correlation between oesophageal cancer and working in the textile industry. Moreover, a high degree of colorectal cancer, thyroid cancer, testicular cancer and nasal cancer was observed among textile workers. As per a study conducted on 1300 people working in 'tie and dye' units in Jodhpur and neighbouring areas, 100 workers were observed to have occupation-related dermatitis. This constituted 7.69% of the total sample. Red RC base and naphthol were observed to be the most common culprits in this regard.

**Exposure to noise:** High levels of noise have been observed in most of the units engaged in the textile industry, particularly those in developing countries. In the long run, exposure to high noise levels has been known to damage the eardrum and cause hearing loss. Other problems like fatigue, absenteeism, annoyance, anxiety, reduction in efficiency, changes in pulse rate and blood pressure as well as sleep disorders have also been noted on account of continuous exposure to noise. Lack of efficient maintenance of machinery is one of the major reasons behind the noise pollution in a majority of the units. Though it causes serious health effects, exposure to noise is often ignored by textile units because its effects are not immediately visible and there is an absence of pain.

A study of 77 employees in textile mills in Nagpur was conducted. This study revealed that 76.6% of the employees were at risk for developing noise-induced hearing loss. The study of Indian textile units by R. Steinberg, J. Hannak and K. Balakrishnan indicated that 21.3% of the workers studied suffered from noise-induced hearing loss.

**Ergonomic issues:** Ergonomic issues are observed in a majority of the units engaged in textile-related activities in India. Most of these units have a working environment that is unsafe and unhealthy for the workers. Workers in these units face a number of problems such as unsuitable furniture, improper ventilation and lighting, and lack of efficient safety measures in case of emergencies. The workers in such units are at risk for developing various occupational diseases. Musculoskeletal disorders like carpal tunnel syndrome, forearm tendinitis, bicipital tendinitis, lower back pain, epicondylitis, neck pain, shoulder pain, and osteoarthritis of the knees are some of the occupational diseases that have been observed among the workers on account of poor ergonomic conditions. These issues are more common in developing nations as compared to developed ones.

As per a study by Parimalam, Kamalamma N. and Ganguli AK in the year 2006, there is a considerable difference in the heights of the stools and the tables used for various operations such as cutting and ironing. This led to the workers having to sit in an uncomfortable position for entire work days. The stools were not padded in most of the units, leading to increased discomfort on the part of the workers. Moreover, the stools did not have a backrest, as a result of which the workers did not get adequate support to the back. In most of the units, the level of lighting was low and improper placement of lighting fixtures led to low lighting at the point of work, leading to eye strain. On account of the continuous use of irons in some units, the humidity level is very high, contributing to the workers discomfort.

Apart from this, lack of efficient measures for the safety of the workers was also observed. Lack of essential items such as first aid kits, fire extinguishers, and alarms was noted in most of the units. This puts the workers under great risk in times of an emergency. Protective equipments like metallic gloves were not provided to the workers in several units for protection against potential accidents and injuries.

### Public Health and Environmental Issues

The apparel and other finished textile products industry is, generally an industry which yields relatively little environmental contamination via discharges into air, soil or water. However, off-gassing of formaldehyde can persist at the retail level in this industry, creating the potential for development of formaldehyde-related allergic, irritative and respiratory symptomatology among both sales people and customers. Additionally, some of the special processes utilized in the garment industry, such as rubberizing and production of lead-based adornments, can pose more serious threats of environmental contamination.

In recent years, growing concerns about the potential adverse health effects associated with exposure to formaldehyde and other fabric treatments has lead to development of a "green" industry. Apparel and other finished textile products are typically sewn from natural rather than synthetic fibre-based materials. Additionally, these natural products are generally not treated with crease-resistant and other finishing agents.

The crowded, often squalid, conditions in the garment industry create ideal conditions for transmission of infectious diseases. In particular, tuberculosis has been a recurrent public health issue among workers in the garment industry.

### Conclusion

Safety and health measures play an important role in any industry. It is essential that the workers be aware of the various occupational hazards in the industry. At the same time, it is

necessary that the management take the necessary steps to protect workers from potential hazardous situations.

The following suggestions can be made to improve the safety and health conditions in textile units:

- The seats of the workers and the tables should be well aligned in height so that there is no musculoskeletal strain.
- There should be proper lighting at the place of work so that eye strain can be avoided.
- Machinery should be well maintained in order to reduce the level of noise. If necessary, certain parts of machines can be replaced.
- In case the noise level cannot be controlled, workers should be provided with earplugs so that exposure to noise can be reduced.
- Workers can be rotated within jobs so that they are not faced with continuous noise exposure for a long period of time.
- There should be proper ventilation at the place of work.
- In order to reduce the exposure to dust, workers should be provided with masks.
- Trained medical personnel and first aid facilities as well as safety equipments such as fire extinguishers and fire alarms should be available at the place of work.
- In units where there is heavy exposure to dangerous chemicals, workers should be provided with safety gloves.
- Proper dust control equipment should be set up and maintained to reduce the workers exposure to cotton dust.
- Medical examinations should be conducted by the employers for the workers from time to time. If significant occupational health problems are observed, appropriate measures should be taken by the management.

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