European Economic Letters
ISSN 2323-5233
Vol 10, Issue 1 (2020)
http://eelet.org.uk

Workers Health and Safety in the Textile Industries in Delhi

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ABSTRACT: India's textile industry is essential to the country's economy, employing a large number of people in both rural and urban locations. The purpose of this article is to look at the health or safety of textile employees in Delhi City. A sample of the 180 employees from Delhi's designated textile businesses was tested for their overall physique, muscular tone, lung health, and vision. The study's goal is to provide a framework for analyzing the hazards that textile employees face as a result of a lack of health or safety requirements in the workplace. Results indicated that the majority of the employees were afflicted by respiratory difficulties, increased muscular tone, visual problems, and musculoskeletal disorders. It's also been shown that job security and regular work has a good influence on a laborer's long-term physical health. However, steps in compliance with the Indian Factories Act, which comprises directives but also procedures for industrial facilities, work environments, and work health & safety norms, must be adopted and implemented immediately. This research will be useful in the future for understanding employees' concerns in the textile sector while they are at work.

Keywords: Environment, Employees, Health, Noise Exposure, Safety, Textile Industry.

1. INTRODUCTION

1.1. Industrial health & safety:

Employee welfare is an interdisciplinary discipline concerned with the health, safety, and quite well of people who work or have been employed. Healthcare focuses on the mental and physical well-being of all workers, contractors, and visitors at work, but also their protections from harm in the event of damage or sickness. The term "safety" refers to a situation in which the danger of damage or injury has been eliminated or reduced to the levels that may be endured. In addition, there are two types of environmental safety. The first is the workplace's internal atmosphere, which is linked to the overall state of the workplace. Finally, there are situations outside of the job that may be hazardous [1]–[3].

Many of the possible problems brought into the sector are the result of bigger, faster, but more difficult to run technologies. Furthermore, the components or operational methods become more intricate, thereby creating health concerns at work. As just a result of automation as well as the desire for higher productivity, workers would have to deal with enhanced workplace stress, which had a severe influence on their health. The purpose of using technological advances or flexible manufacturing processes is to shorten process times or increase productive work time, thereby increasing work speed or intensity. This increases stress & pressure, but also psychological or ergonomic problems. Workplace accidents or illnesses are frequently covered in the media, but accurate data is still unknown, as per the International Labour Organization (According to estimates from 2003, about 2 million individuals die each year as a result of the work related injury and illness throughout the world, costing the global economy an approximated $1,260,000 million. As of the most recent European figures, almost 4 million people have been injured while working or lost more than three days of work [4]–[6].

The severity of industrial workers' physical injuries ranges from minor to severe. These occurrences, on the other hand, mostly afflicted the hands and fingers. According to the damages, the fingers of the upper limbs were the most commonly involved in accidents. Upon both left and right hands, accidents mostly injured the index, thumb, especially middle fingers. The majority of lower extremity injuries happened on the toe, foot, and then leg. Noise pollution has been linked to many harmful psychological and physiological health effects. For people with mild noise-induced hearing loss, working in locations where daily doses of noise exposure surpass 89 dB is very harmful. When noise levels are decreased, workers are much less likely to get killed as a consequence of their inability to hear auditory warning cues. This would not only enhance overall working condition, but it would also reduce the risk of noise induced hearing damage [7]–[9].

Seasonal implications on employee health at work Seasons play an important role as well. In various questionnaire research, lesser humidity has been connected to an increase in the incidence of dry air, as well as sensory discomfort of the airways or eyes. In the following research, higher relative humidity was found to induce less pain. The correlations

are stronger at room temperatures over 21°C, or they are more prevalent during the hot seasons. Several studies have also found that a temperature rise that might result in drop in humidity levels enhances the incidence of eye irritations symptoms. Desiccation of the employees' eyes may also occur as a result of the higher temperature. Nevertheless, a lot of investigations have failed to find clear links between symptoms and thermal climate. Several variables might influence the outcome, and the cause of the disagreement is unknown [10]–[13].

Because it employs a large population of persons in both rural and urban areas, India's textile industry is critical to the country's economy. It not only generates about 27percent of the country's foreign exchange, but it also serves as a repository for the country's cultural heritage. This business is estimated to have produced over 12 million new employment by 2012, with yearly revenue of roughly US$ 115 billion [14]. With just an estimated us$ 224 million in various textile projects, India's state of Delhi is the country's largest contributor to the textile industry. The present study focuses on Liberia's textile industry. Industry employees' health is a problem, according to a study performed in India [15].

1.2. The Textile Industry's Significance of Workplace Safety:

Textiles are used to cover our sofas, floors, windows, and beds, among other things. In addition, the textile industry in the United States, like practically all other businesses, is subject to stringent occupational health and safety regulations. In the textile sector, employee exposure to such chemicals must be kept to a minimum. Several chemical dyes often used in fabric dyeing, for example, have been linked to the development of cancer. However, some steps may be taken to lessen the risk, such as workplace observation or incident reporting. The use of personal protective equipment (PPE), clothing, and eyewear, for example, or the collection of air samples at regular intervals to evaluate exposure to certain chemicals, are also possible solutions. Encourage employees to utilize an easy-to-use EHS software platform to report difficulties so that appropriate remedies may be given more quickly. Changes to company processes may be undertaken as a consequence of the examination and analysis of events, reducing the chance of similar accidents happening again and thereby boosting everyone's safety.

1.3. Industrial Hygiene is being observed or tracked:

Procedures for safety and health might go beyond recommended practices like ventilation or chemical exposure limits. They may also include guidelines for continuous monitoring and evaluation, such as those that apply when cotton dust is present in the workplace. Industrial hygiene software may assist in the creation and maintenance of an exposure assessment or monitoring schedule, as well as the recording and reporting of data as required. Procedures or processes that need to be revised to guarantee safety may be flagged by risk assessments embedded into EHS systems.

1.3.1. Effectively Manage Training

Familiarize your staff with local, state, or federal rules, and also industry standards, for limiting or managing exposure, damage, including responsibility in the textile sector. Furthermore, developing an EHS training routine guarantees that regulations and laws are learned, comprehended, and followed. Make sure there are processes in place for work-related accidents and safety breaches, including those that result in active or immediate injury and those that just rule violations. Training should be recorded in your EHS application after it has been produced and delivered. Document them as well as further training is carried out. Drills and practices should be included in your EHS systems and processes. Establish a chain of command and make sure everyone in it knows their position and duties when it comes to dealing with workplace health and safety concerns. Include any regulatory reporting obligations in your training; know who you should report to, when, and how. Use EHS software to record this information for improved workflow operations. It may also be used to track staff training and provide new programs to individuals on the front lines. This will assist you in meeting regulatory and internal obligations, as well as simplifying your reporting and auditing. Let us show you how EHS software helps textile industry safety if you aren't currently utilizing it as a strong and adaptable tool. We can supply safety personnel with both the data they need to maintain compliance with government and industry requirements, from the most basic reporting tasks to the most complicated recording of training and exercises.

Health Effects of Dyes and Chemicals There is no evidence that the dyestuffs used in textile dyeing or finishing are harmful to humans at the levels of exposure that factory jobs are subjected to. Long-term or unintended overexposure, but on the other hand, maybe harmful to one's health, thus all colors or chemicals should be treated with care. Respiratory issues caused by dye particles inhaled are the most prevalent danger of reactive dyes. They may sometimes influence a person's immune system, or in extreme situations, this might result in a strong reaction when the individual inhales the dye again. Itching, sneezing, watery eyes, or asthma symptoms like breathing problems are all indicators of respiratory sensitization [16]–[19].

1.4. Safety Concerns in the Textile Industry:

The textile business is fraught with hazards including safety problems, most of which revolve around textile mills or manufacturing. Textile mills face the following threats:

- Fires: These are caused by chemicals or combustible fabrics, particularly cotton.
- Explosions: While textile equipment has gone a long way, it, like every piece of technology, may break down, have such a short, or burst a circuit.
- Employee deafness: Textile mills are often huge rooms with all of the textile machines running at the same time. The noisy devices are harmful to the ear, particularly if they are used often.
- Chemical exposure: Textiles are chemically dipped and dyed multiple times throughout the finishing, cleaning, or softening procedures. This implies that staff is continually exposed to these hazardous compounds.

Machine-related injuries: While the majority of milling equipment is now automated, this is not the situation in all mills or nations. Many machines are still controlled by qualified individuals who risk getting their hands & arms caught in the mechanism, causing serious damage. Cotton dust is produced during the preparation of cotton owing to synthetic fiber disintegration in the air. Cotton, chemical pesticides used on the cotton, and soil are all present in this dust. If employees are not adequately disguised, they all go into the air and eventually into their lungs. Employees may get major lung problems as a result of this. Textile mills include several hazards, including extremely volatile chemicals, combustible materials (some of which have been dipped inside the chemicals), and electrical or gas-powered devices. Even though the mill is well-maintained, people might be injured or killed if anything goes wrong.

In this paper, the researcher examines the worker's health or safety in the textile industries. And also discuss the significance of workplace safety, industrial hygiene, and also author surveys workers facing problems during work in the textile industry.

2. LITERATURE REVIEW

Ng Khean Rahim et al [20] Discussed the role of the safety climate in the successful implementation of safety management systems which states Construction businesses' productivity, financial performance, and public perception are all significantly impacted by workplace accidents, which also have a high human cost. Construction businesses create safety management and include it into their plans, policies, and practices to reduce occupational accidents and injuries. Construction companies must offer safety incentives and link them to all facets of their safety management systems, include independent contractors in safety meetings and training, and give responsibility and authority to everyone involved in the implementation of construction projects in order to successfully implement safety management systems and improve safety performance.

icole S.N. Sze et al. [21] explained implementation of safety management systems in hong kong construction industry which is a safety practitioner's perspective which consists SMS deployment is required in certain sectors, such as building construction. Therefore, it is crucial to assess the SMS's success in raising construction safety standards and pinpoint the variables affecting its adoption in Hong Kong. Method: Structured interviews were utilised to determine the critical success factors (CSFs), advantages, and challenges of applying the SMS in the construction sector. A study of the present state-of-the-practice assisted in identifying these aspects.

Safety and health concerns among employees in the garment and textile sectors were investigated by F. Gashaw and C. Cook. Although the Indian textile industry contributes significantly to the growth of the Indian economy and plays a vital role in giving employment to the country's rural and urban populations, it fails to promote education or health as essential components of human development. There are many dangers encountered by the employees in the textile sector such as exposure to chemicals, exposure to cotton dust, noise and ergonomics difficulties, etc. Certain elements contribute to the occurrence of workplace hazards, such as job stress, inappropriate use of personal protective equipment, stress, an unhealthy working environment, and bad working conditions, to name a few. The majority of employees are uneducated and have no idea about safety precautions they should take at work. Employees need to be informed of the many occupational dangers to avoid health problems in the workplace. Management must also take the appropriate precautions to safeguard employees from potentially harmful situations [22].

Researchers used a variety of methodologies to identify health-related issues that textile workers face and provide recommendations in a recent publication, but no one mentioned how to solve these issues. The study's main goal is to use a survey to determine the real health problems that textile workers face and to offer solutions.

3. METHODOLOGY

3.1. Design:

To create a framework for comprehending the dangers that textile workers face as a result of the industry's absence of health or safety regulations.

3.2. Sample:

Using various methodologies, a sampling of 180 employees from Delhi's recognized textile companies were examined for their overall physique, lung function, muscular tone, or vision. The study's goal was to provide a framework for analyzing the hazards that textile employees face as a result of a lack of the health or safety requirements in workplace.

3.3. Data collection:

Throughout the field study, a checklist was utilized to conduct semi structured interview with unit owner or workers in six textiles cluster. The various stages of each textile's production, such as the raw materials utilized, their environmental impact, as well as assessment of previous CETP devices (recently established centralized collection or treatment plants), Employees' clinical state, as well as their working conditions, were all looked into. The research examined at both small and medium sized companies. In the first step, six textile factories were chosen from a maximum of 29 textile facilities in the city using a random sample approach from each of the six textiles. This equates to around 21% of the total population. From November 2010 to November 2011, a survey was conducted. Workers were chosen from these textile mills inside the second stage. A full list of permanent employees between the ages of 20 and 55 with at least three years of professional experience was proportionally picked from all six textile factories to select responders [23].

A total of 180 textile employees (who agreed to be interviewed) took part in the study and were evaluated on a variety of factors. The monitoring devices and parameters used to assess the health of employees are listed below:

3.3.1. Weight or Height:

Depending on a person's weight or height, mass index is indeed a heuristic estimate for a person's body fats. The BMI is determined by eating habits, housing or working environments, and the kind and length of physical labor.

3.3.2. Hand Grips Meter:

This test determines the maximum isometric strength of a hand or forearm muscle. This test is often used to assess overall strength. Strength is affected by a variety of factors, include daily food intake, working time, and job habits.

3.3.3. Peak Flow Meter:

A peak flows meters is a compact, inexpensive hands held instrument that measures the amounts of air that exits the lungs inside a single "quick burst." Adults should have a peak expiratory flow of 350 l/min, while 200 l/minutes indicate chronics bronchitis or, as a result, important lung damages.

3.3.4. Eye test:

A Snellen chart is a visual acuity assessment tool used by eye professionals and others. There are numerous lines of large letters on the chart. The first line features extremely large characters and symbols, only with letters or symbols becoming smaller in subsequent rows. It implies that a person has strong eyesight if the tiniest row can be read properly.

3.4. Data analysis:

The purpose of this baseline research aimed to investigate the unseen links between working inside the textile industry but also employee health. This study is based on pilot research, which needs more in-depth observations of the larger samples and testing at specific pilot’s sites. The following are some major conclusions from the pilot study:

- Employees in all studied textile sectors improved their overall body health as they worked for longer periods, demonstrating that regular labor is advantageous to employees in the long term.
- Only one-tenth of the employees in the survey appear to have normal lung functions, indicating that they were all exposed to substantial levels of air pollution. Around 60percent of employees have Asthmatic tendencies, whereas 25percent had Chronic Bronchitis symptoms. The rate of chronic distress appears to grow with the number of years working.
- The muscular tone of weavers who engage in repeated rigorous activity declines as the amount of decades they have employed in the studied textile sectors increases.
- Most employees' vision deteriorates with time in all places, and just a comparison of employees' eyesight reveals that it deteriorates more quickly for all those engaged in occupations that require extreme and continual attention to the details.
- Employees' complaints include body pains, sores, wounds, burns, or calluses, as well as lung or eye problems, hearing, fatigue and insomnia, and stomach issues. Muscle and body discomfort have been reported by 73 percent of employees.
- Employee's habits of smoking, drinking alcohol, chewing tobacco, or using intoxicating products, on the other hand, exacerbate some of the issues.

Table 1: Illustrate the Number of Workers and Its Process in the Textile Industry.

Process of textile industries	Female	Male	Total
Spinning	10	18	28
Knitting	13	19	32
Fiber Formation	8	12	20
Weaving	16	14	30
Bleaching	10	15	25
Printing	7	8	15
Finishing	5	8	13
Dyeing	7	10	17
Total	76	104	180

Table 2: Illustrate the Body Mass Indexes of the Workers.

Category of employees	No. of employees	Body Mass Index		
		Under weights	Normal	Extra weight
Spinning	28	10	18	0
Knitting	32	13	18	1
Fiber Formation	20	7	12	1
Weaving	30	9	21	0
Bleaching	25	9	16	0
Printing	15	6	9	0
Finishing	13	5	8	0
Dyeing	17	6	11	0

Table 3: Illustrate the Pulmonary Functions Test of the Worker

Category of employees	No. of employees	Pulmonary Function Test		
		Chronic Bronchitis	Normal	Asthmatic Tendency
Spinning	28	8	3	17
Knitting	32	9	3	20
Fiber Formation	20	6	4	10
Weaving	30	8	5	17
Bleaching	25	5	4	16
Printing	15	3	2	10
Finishing	13	2	4	7
Dyeing	17	10	3	4

4. RESULTS AND DISCUSSION

Safety and Health Indicators: The team has been able to interview or assess the specified health status of 180 employees in the industries evaluated. To make it easier to compare the occupational health condition of this personnel, they were

separated into two groups based on the number of years they had been with the present unit: 124 had been with the unit for less than 5 years, whereas 57 had been with them for even longer. In our sample, Table 1 illustrates the numbers of the peoples who participated in different procedures.

Employees' BMI (Body Mass Index). Table 2 reveals that those who lived in the same unit for a long time were healthier. To put it another way, regular work helps workers while also striving to reflect the company's overall health. Our research results suggest that current works with job safety placed above a white time as well as incomes that allow workers to support themselves but also their families can help improve BMI.

Pulmonary Health and the Pulmonary Functions Test (PFT): The PFT test is creating a lot of stress (Table 3). In other words, in a business environment that is detrimental to their lung, all worker is exposed to the Vapours, fumes, fiber, or element. Precautions are needed in such instances.

- Install exhaust systems to guarantee appropriate ventilation within the sheds or a regular supply of new air.
- Employ pigments or household cleaners that do not produce known to be toxic Vapours.
- Conduct frequent medical checks of all employees to detect early signs of lung distress, and rotate tasks so that affected workers' excitation wavelength and intensity are reduced.

4.1. Hand Grips Meters (HGM) Muscle Tone:

The personnel in the HGM test exhibited a declining health state. Muscle tone has worsened, according to the findings of the test.

- Regular breaks to prevent muscle fatigue;
- Enhanced grip patterns for block or screen;
- The designs of acceptable regions and registrations rules; or finally
- Table height that allow force to be transferred directly toward the blocking are among the precautionary measures.

These actions would also increase productivity.

4.2. Eye Strains or Eyesight:

Aside from physical effect of the labor on the body, lung, or muscles tone, workers' eyes appear to be affected by repetitive exertion and continual visual attention to detail. The Snellen chart can be used to identify whether someone has normal vision, hypermetropia (farsightedness), or myopia (nearsightedness) (short-sightedness). A few of the workers in both categories reported watering, straining, cataracts, and edema in their eyes. Based on our observations at the workplace, the overwhelming of sheds lack uniform or adequate lighting. Eye muscle fatigue may be avoided by using proper lighting and taking regular breaks from work, and by modifying work tables to allow the job to be completed inside the typical eye range, workers can relax even more while enhancing the quality of work.

4.3. Muscle Pains and Body Pains:

Several of the employees also complained of muscle pains in their backs, joints, even lower abdomen. There have been some reports of pain in the right arm, chest, or shoulder, according to the results. These grievances are unmistakably linked to the nature of labor. This study suggests that you take regular relaxation intervals.

The study included survey data of the 180 textile employees from the various textile industry in Delhi, as well as the findings revealed that the majority of workers were affected by unhealthy or unsafe working conditions, with 85 percent reporting respiratory problems, 70 percent reporting increased muscle tone, 48 percent reporting eye problems, or 73 percent reporting the musculoskeletal problem. As a result, prompt action is required to adopts or execute actions in compliance with the Indian Factory Acts, which comprises industry installation, workplace culture, but also works health & safety rules. As a result of their findings, the authors underline the importance of policies in the effective implementation of a health-safety program. Employees' well-being, policy but also objectives linked to danger recognition, emergency requirements, or employees' engagement in occupational safety, risk assessment, or risk control will all be addressed. Senior management will be dedicated to healthy and safe working practices as a result of this program. The technology employed in the power loom sector in Delhi is outdated. The Technology Upgradation Funds (TUF) Program is run by the national government to modernize the power loom industry. So because the majority of weaving are unaware of the method, education is required. The introduction of required health care insurance for the impacted parties might serve as a powerful motivator to enhance the plant's health & safety regulations. Incentives from stakeholders to smaller companies for implementing such an approach will act as a motivator for the plants to work well.

5. CONCLUSION

Procedures for safety or health are essential in any industry. Employees must be informed of the many occupational hazards present in the industry. Simultaneously, management should take the necessary safeguards to protect personnel from potentially hazardous situations. To summarize, the authors believe that regular employment with regular remuneration for workers, its use of nontoxic materials or processes, increased lighting or ventilation, frequent medical check-ups, proper rest intervals, and job rotation are all feasible solutions for reducing the problem.

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