



RESEARCH PAPER

Comparative Analysis of Safety Management Systems in Large and Small Scale Textile Industries of Pakistan

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ABSTRACT

In order to avert a chemical accident that could result in tragic consequences, environmental contamination risk analysis and risk management in the textile business are essential. Further, in order to avert a chemical disaster that could have horrific consequences, environmental contamination risk analysis and risk management are very essential in the textile sector. When it comes to economics and employment, the textile industry is a significant contributor in many countries. Despite making significant economic contributions, both small and large-scale textile businesses have a negative impact on the environment. Textile manufacturing processes require a lot of water, energy, and other chemicals, all of which produce waste or by-products that must be disposed of. The direct discharge of untreated effluents into nearby water bodies is the biggest problem with water utilisation. Pollutants include not only water bodies but also other substances like strong odours, gas emissions, etc. At the same time, maintaining output level is essential. This article assesses the steps taken to reduce water and air pollution in the textile industry. The prior study's data on occupational diseases and injuries from 2010 to 2020 was compiled from reports of workplace mishaps in establishments covered by the 1934 Factories Act. There are some suggestions for improving Pakistan's culture of health and safety as well as explanations of the reasons of these illnesses and injuries in each of the industries. The employees of two of Pakistan's largest textile manufacturing facilities provided the data for this study. To acquire data, a simple random sampling procedure was used. By comparing the differences in educational attainment, accident causes, and population density between rural and urban locations, correlations can be formed. Both companies' health and safety management systems were found to be unsatisfactory. The health and safety management systems of both businesses must be improved.

Keywords: Hazards, Health, PPE's, Safety Management Systems

Introduction

Different Safety management systems have been widely used in industrial sector. "A formal risk management strategy is a safety management system. Organizations may implement systems for managing risks and identifying hazards, setting safety goals and reporting requirements, and implementing audit, investigation, safety education, and corrective action protocols under an SMS." (Wilson and McCutcheon, 2003)¹. Hale and Baram in 2009², carried out thorough review of literature on health, safety and environment (HSE) management and exposed many lines of research and also isolated such studies which seem relevant to each other. Modern safety-critical organizations exhibit complex, nonlinear dynamics with a wide range of interconnected actors and processes. As a result of these complicated dynamics, safety concerns are more often hidden until an incident or even a catastrophic disaster happens.(Alexei Sharpanskykh, 2012)³. The major environmental harm brought on by the textile sector is the result of the release of untreated effluents into

water bodies. (Bruno Lellis, 2019)⁴. In a study carried out by Priha and Riipinen (2005)⁵ explained the in the textile industry exposure of workers to different chemicals was very critical, especially during dyeing and printing activities. Those chemicals may be benzidine, brighteners, fixatives and solvents, formaldehyde releasing chemicals, organophosphorus and organobromine compounds such as flame retardants or and agents for antimicrobial activity. Various types of chemicals in gaseous, liquid, and solid forms are employed throughout process and manufacturing in the chemical and textile industries. Exposure to these compounds, which are poisonous, corrosive, explosive, combustible, radioactive, reactive, and carcinogenic, can have short-term or long-term consequences on human health. (Najaf Shah, 2015)⁶. Moreover chemical exposure to workers skin and inhalation process in textile industry can cause adverse health effects. In a study, a researcher Mangal, (2010)⁷ showed the correlation between formaldehyde exposure and nasal, lung, brain cancer and leukemia. He also concluded that chronic exposure to formaldehyde could lead to respiratory disorders and eczema. Similarly, Kant, (2012)⁸ in Jodhpur also observed the skin dermatitis in 100/1300 workers exposed to chemicals in tie and dye unit. Other different occupational cancers were also observed in textile industry in a study conducted by Hale and Hovden in 2008⁹. They found a correlation between buccal cavity and pharynx cancer and exposure to chemicals in the textile industry. Moreover, in high degree colorectal, thyroid, testicular and nasal cancers were also observed among textile workers. Also non-Hodgkin's lymphoma was also observed. Metgud (2008)¹⁰ carried out an observational cross-sectional study on a sample of 100 female workers. Their cardiovascular, respiratory and musculo-skeletal profile before, during and at the end of work were taken to get the information of their health status. Surprisingly, their respiratory function did not change significantly. However, 91% of the female workers had musculoskeletal issues. This study came to the conclusion that women's primary issues in the small-scale spinning business were discomfort and fatigue. It was noted that ergonomic considerations, such as the use of a backrest for support and regular breaks, could lead to the management of the musculoskeletal health issues. Therefore, it's crucial to comprehend the causes of occupational accidents so that effective precautions can be adopted to lower the likelihood of such occurrences.

Material and Methods

There is a possibility of accidents in every industry, whether it is manufacturing, construction or a textile industry and in less developed countries like Pakistan, the rate of the accidents in the textile sector is much greater than as compare to other industries. The main objectives of this study are to: Explore the workers and management responses regarding the occupational health and safety aspects, Monitor the perspective of occupational health and safety in textile industry regarding risks and hazards and develop a plan to take organization interested in improving its management of rules through a critical assessment and improvement process. In this study, the preceding data on occupational illnesses and injuries from 2010 to 2020 were gathered from industrial accidents in factories registered under the 1934 Factories Act. The causes of these illnesses and injuries in each of the industries will be attempted to be explained, and some recommendations for enhancing Pakistan's culture of health and safety will be made. The information in this study was gathered from the staff of two of Pakistan's largest textile manufacturing facilities. Correlations could be drawn by carefully examining the disparities between the populations of rural and urban areas, their educational attainment, and the causes of accidents.

Simple random sampling technique was used for data collection. For surveying the workers and management responses about the occupational health and safety rules, quantitative research methodology was used. We have conducted our survey in two of the recognized Textile Industries of Lahore. The Questionnaires contains 44 questions about the Safety Management System of those organizations. Answers of questionnaires are

conducted from the Managers as well as low level staff. The following table shows the number of respondents

The following key points are selected to form the questionnaire

1. Emergency Action Plan
2. Exit Doors
3. Fire Protection
4. Flammables and Combustibles
5. Chemical Safety
6. Environmental Control

SPSS software is used for the analysis of data gathered from the population.

Results and Discussion

The primary goal of this study was to determine how the textile industry felt about safety management systems. In order to establish conclusions and make pertinent recommendations in light of the study's findings, an attempt has been made to research and comprehend associated facts. The establishment of the health and safety regulations for employees of the textile industries may benefit from these recommendations.

Table 2
Distribution of the respondents according to their age

Age (Years)	Frequency	%
Young (up to 35)	84	42
Middle (> 35-50)	108	54
Old (> 50)	8	4
Total	200	100

The data described in Table 2 illustrate that the majority (54%) of workers were middle aged (35-50), while one-third (42%) were young (up to 35 years). One-fourth (4%) of the workers belonged to old age (> 50 years).

Table 3
Distribution of the respondents according to their Education

Age (Years)	Frequency	%
1-5 Years schooling	1	1
6-10 Years of schooling	42	21
Above 10	70	35
Literate + Technical diploma	86	43
Total	200	100

About one-third (42%) of the workers were literate and having some technical diploma. Slightly less than one-third (21%) of the respondents had 6-10 years schooling. Data further shows that 1 percent of workers had 1-5 years schooling, while 35% percent were above matric.

There are three categories upon which the findings of the study are divided, these includes managers, workers and overall comparisons of textile factories through observation technique.

Worker Respondents

Quantitative data from employees at textile mills in the Lahore district were gathered in order to examine the workers' SMS perspectives. A pre-planned questionnaire was used to interview these employees. The following aspects of the information were compiled from the workers.

1. Emergency Action Plan
2. Exit Doors
3. Fire Protection
4. Flammables and Combustibles
5. Chemical Safety
6. Environmental Control

We have used Bar Charts to show the data that we have obtained from the two Textile organizations A and B. We have taken employees response in percentage on y-axis and six questionnaire portions on the x-axis. We have taken the percentage of all questions in a portion as we have divide are questionnaire in the six portions.

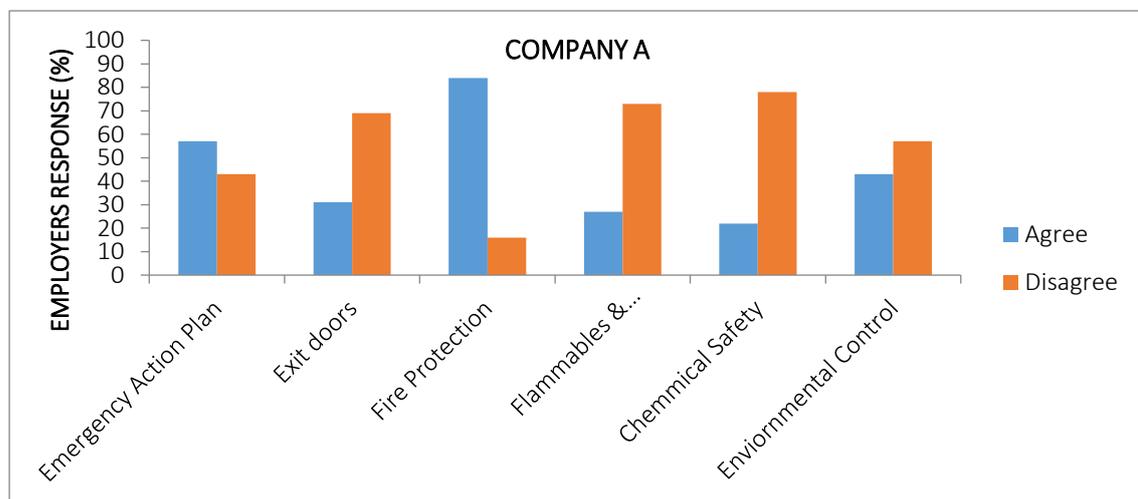


Fig: 1 A graph showing collective data of Employee response to questionnaire of Company A

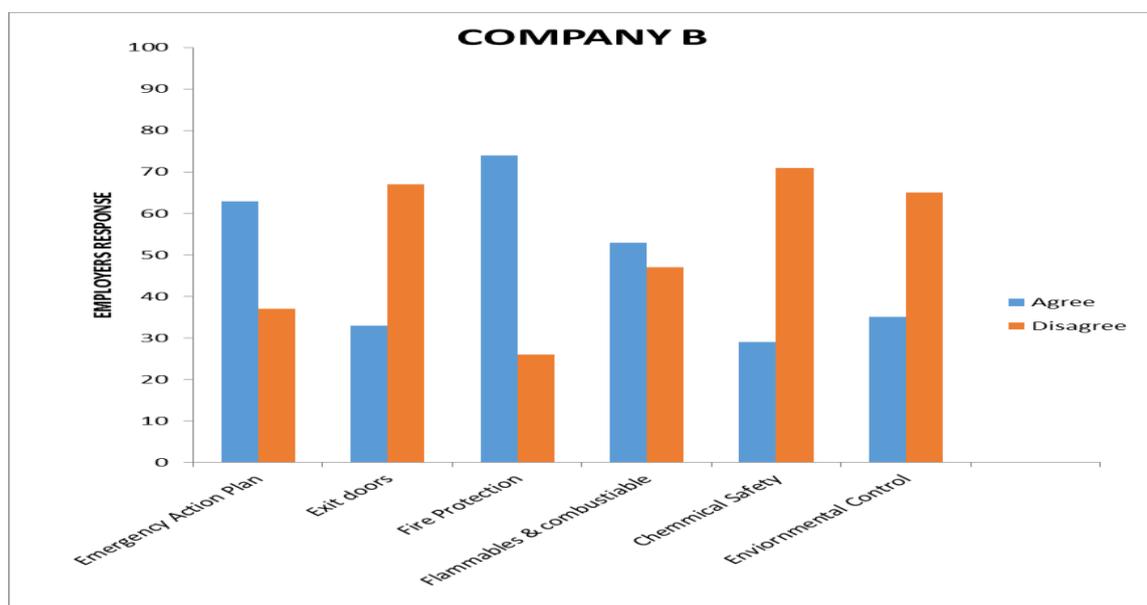


Fig: 2 A graph showing collective data of Employee response to questionnaire of Company B

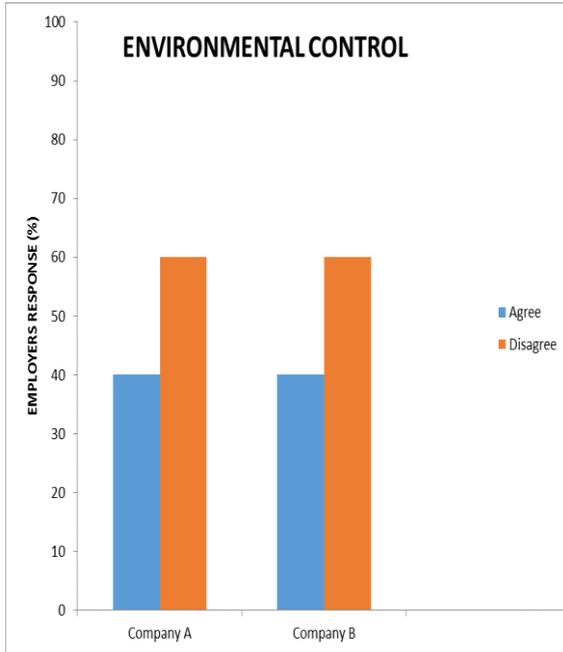


Fig: 3 A graph showing data collection about awareness regarding Environmental control

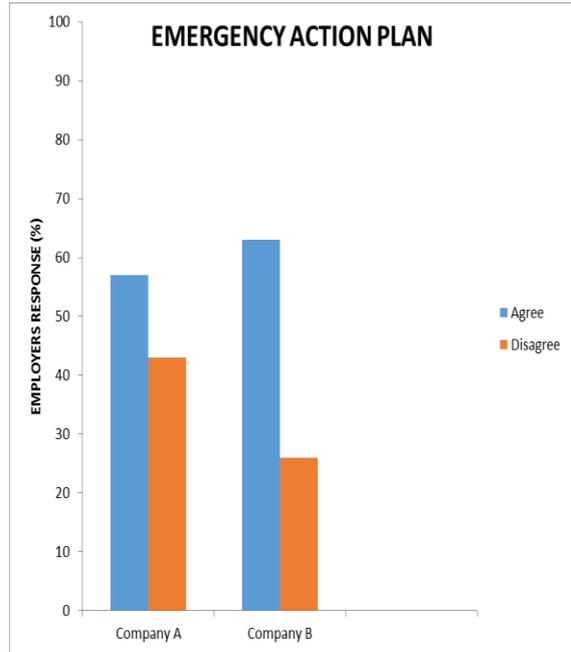


Fig: 4 A graph showing data collection about awareness regarding Emergency action plan

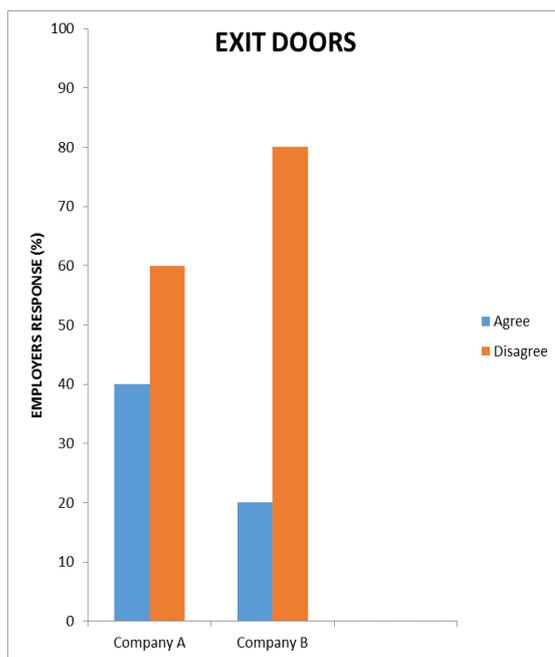


Fig: 5 A graph showing data collection about awareness regarding Exit Doors

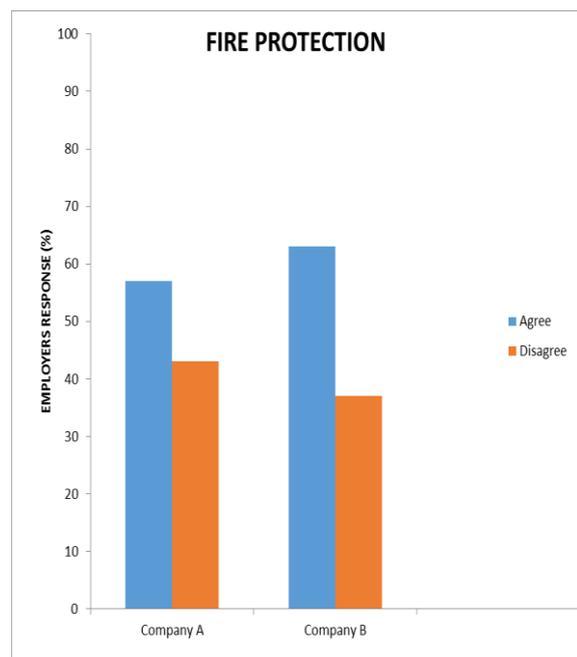


Fig: 6 A graph showing data collection about awareness regarding Fire Protection

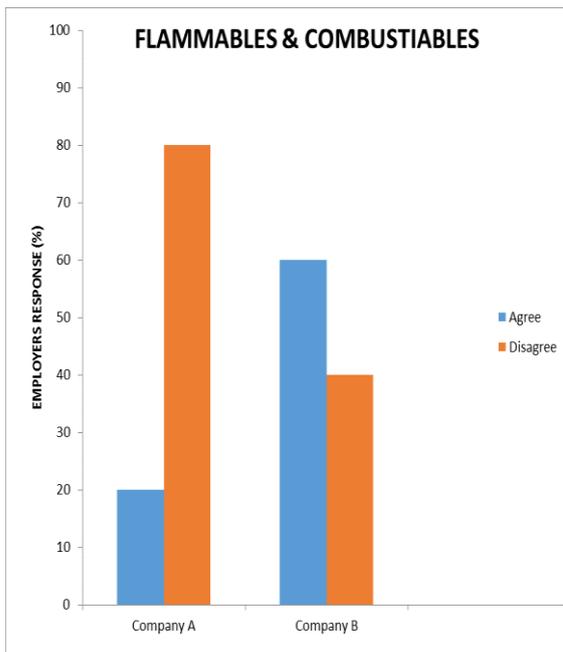


Fig: 7 A graph showing data collection about awareness regarding F&C

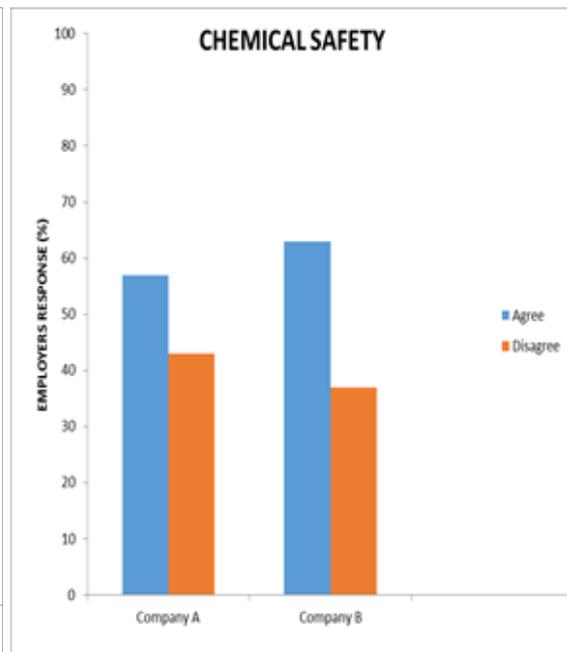


Fig: 8 A graph showing data collection about awareness regarding Chemical Safety

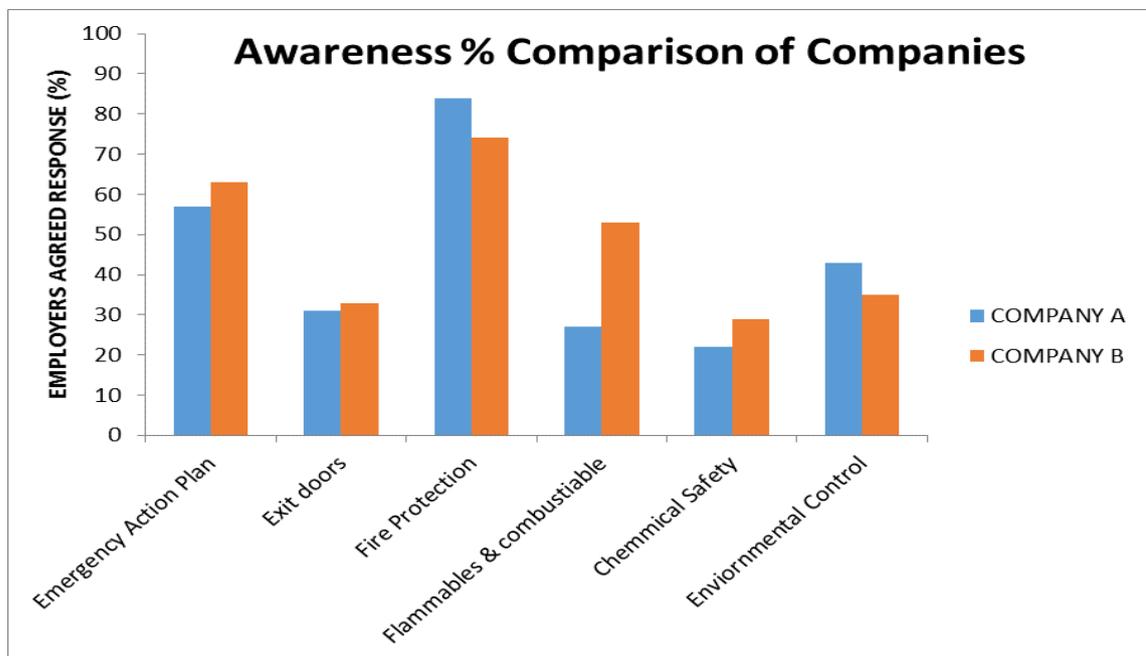


Fig: 9 A graph showing comparative awareness regarding safety management systems of both companies

Conclusion

Health and Management System of both companies are not satisfactory at all. The company A is bigger company and having a better infrastructure so the system working in company A is slightly better than company B, but the employer of company A is still not aware about their safety management system as showing by the graph so the awareness

about SMS running in the organization is key lacking point. There are some suggestions according to our data analysis regarding to our key points.

The companies should have completely or manually design their emergency plans and then also designate the responsibilities to the employees. The companies should conduct awareness sessions for the employees of all level according to their need and aware them how they should react during emergency situations.

In the both companies only round about 30% employees knows about the exit doors, usage of exit doors or even the location of exit .The companies should give labels to the exit doors and they should not be used for normal execution. The exit doors should open in an open space. The exit doors should be wide so that at a time much of the employees can pass through them and most of the all the employees should know about their location for this purpose the organizations can use sign board.

The response to this part of questionnaire is very good from both organizations there are many of the good workable conditioned fire extinguisher that we have seen in the both organizations in every department with their usage method slips and also the slop containing refilling date and expiry date which is conducted on weekly basis but we'll like to suggest that the companies should also conduct a short training session each month about their usage techniques because some of the employees strongly disagree about their knowledge to handle the fire extinguishers.

The company B is not using the approved container for the storage purpose they are using locally made containers that are not approved from any of the authorized organizations which can be very disastrous for as they are storing combustibles chemicals. Most of the storage rooms in both organizations didn't have mechanical or gravitational ventilation so the room should be designed with respect to their use.

Both companies didn't have the proper list of chemicals which they are excreting from their finishing or dying departments, they haven't showed any interest to their by-products. The employees of the organizations are strictly ordered to use the PPE's especially during work in the dying department. Employees are also advised to utilize the respirators. MSDS (material safety data sheet) should be displayed with every chemical where it is being used.

The response of this portion is ambivalent. The companies should develop written environmental protection plan not only for internal but also for external environment. They also used warning sign charts such as "NO SMOKING" on their working areas in order to make their environment clean and workable.

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