



Effect of a Secure Environment on the Efficiency of Security in the Textile Dyeing Sectors

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Abstract

This research investigates the connection between the safety environment and safety performance in India's textile dyeing business, with safety motivation and safety training serving as mediators and moderators, respectively. The information was given by 180 people from different areas of the textile dyeing industry. The study's findings demonstrated that, rather than the other way around, in India's textile-dyeing enterprises, safety motivation functions as a mediator between safety motivation and safety performance. Contrary to common opinion, safety training has little impact on the relationship between the culture of safety and performance. The employees' responses were a huge help in figuring out how to increase workplace safety.

Keywords: Textile dyeing; Safety performance; Safety motivation; Safety climate; Safety training

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1. Introduction

The majority of industrial accidents occurs because there is no effective safety management system in place or is a deficient one. In light of this, during the past three decades, workplace safety has emerged as the primary study field. Nonetheless, the main objective of the research has been to forecast outcomes linked to safety, such as accidents and damages, to offer useful guidance for enhancing occupational safety outcomes now businesses and management. A breakthrough in the dyeing of cellulosic materials occurred with the discovery of dyestuffs, notably reactive dyes, and their commercial distribution. The cost of raw materials for dyestuffs typically rises sharply as a result of oil prices. This enabled the creation of dyestuffs at a lower cost by improving the efficiency of the manufacturing process and by switching out chromogens with weak color strength, such as anthraquinones, for chromogens with strong color strength, like heterocyclic azo dyes [1]. Several health issues, including headaches, cough, depression, colds, disturbed sleep, and skin allergies, affect employees in the textile business. These problems may be related to the duration of the employees' exposure, smoking, consuming alcohol, chewing tobacco, and eating habits. Inadequate health and safety conditions are a major contributor to occupational injuries among workers in the textile industry. Together with understanding the mechanism by which this impact works, extensive knowledge of the numerous factors

that affect safety is also necessary. Prior research showed that human error, technology error, and system error all contribute to workplace accidents and injuries at the same time. After looking at incidents in a variety of industries, experts like Bowander and Gupta concluded that occupational health and safety practices, laws, and plans need to be modified, especially in emerging nations [2]. Social, organizational, and cultural aspects of safety have an impact on safety performance. Although there isn't a clear agreement, safety atmosphere, and safety culture have widely agreed aspects. Predictors of safety outcomes, such as accidents and injuries. Before, the emphasis was on each climate and its safety results, although more newly, research accept begun to pay more attention to the connections between the organizational climate, the safety climate, and the correlations between safety performances. Yet, as time goes on, different studies reveal new features of a safe environment and explore the link comparing climate and safety behavior by taking into account the mediator roles of security motivation also knowledge [3]. Together with management ideals, coworker and supervisor support, and a safe environment. Revealed that the CEO, managers, and employees' commitment to safety is determined by the safety climate they create. In addition to their assessment of danger and responsiveness to emergencies, the investigation into the connection between employees' attitudes toward using personal protective

equipment and safety behavior. Although there have been several reports of study in the field of safety management from across the globe, Indian textile companies have not produced any noteworthy examples of safety research. Nevertheless, the safety and health procedures in the Indian textile sector are still debatable, and by looking back at the incidents that have occurred there in the past, one may get an idea of how safe things are now [4]. The tragedy at the textile mill in X, when 300 people were burned to death and later died of asphyxia, is one of the main incidents. The absence of fire safety measures, the separation of raw materials according to fire danger, safe escape designs, the use of fire detection drills, examinations before awarding permits, and sufficient instruction and comprehension on the use of security devices are the major causes of these occurrences. Even the most fundamental safety features, including sprinklers and alarms, are lacking in many textile companies. Exploring safety procedures and the underlying reasons for these occurrences in the textile industry is therefore urgently necessary [5]. The paper [6] was conducted to explain sustainability in general in the industrial and textile industries. Impact of textile production, the process, and use on the economy, society, and environment. The textile dyeing sector is one of the top users of chemicals, therefore the goal of this study was to develop an MCDM structure for choosing environmentally responsible providers [7]. The paper [8] used in the textile industry, the creation of wastewater, the textile industry wastewater (TIWW)'s nature, chemical composition, environmental effects, health risks, and each of various treatment alternatives. The paper [9] examined the environmental risks that chemicals and dyes in used dye baths, advances into potential treatments for the treatment of dyed wastewater, including nanotechnology, also in particular explains research that used dyeing discharge samples collected from local textile processing businesses. The adoption of Cleaner Production Practices (CPP) can enhance the activities of the textile industry, economy, and environment. The paper [10] was to determine if Large Textile Industries' (LTI) implementation of CPP had a favorable impact on their economic, environmental, and operational performance. The paper [11] will describe ways to make this resource more valuable while highlighting the difficulties and problems associated with handling textile waste in light of environmental considerations. This chapter's major goal is to describe highlighting the features and toxicological effects of textile manufacturing on the surroundings and human health, as well as its effluent. The paper [12] discussed all the existing techniques for removing pollutants from wastewater and degrading textile colors. The prospects, difficulties, and suggestions related to textile effluent are also covered. The paper [13] suggested an industrial Internet of Things (IIoT)-based service-oriented platform for process and system efficiency improvement. The platform takes into account the needs of the industry's dyeing and finishing facilities and, by utilizing a service-oriented architectural design, effectively guarantees interoperability and services. To increase circularity and sustainability in the textile industry, this paper will examine energy usage, environmental impact, and the use of renewable energy sources in textile businesses [14]. The environmental effects of sustainable wet processing methods in the textile industry are covered. A significant portion of the textile industry is involved in wet processing, which has an impact on the

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finished product and the fabric's quality. At different phases of the wet processing activity, large amounts of water, chemicals, and energy are needed [15].

The goal of this paper is to better understand the relationship between a safe environment and safety performance in India's textile dyeing industry. Safety training and safety motivation are used as mediators and moderators in this research, respectively.

The following sections of the article are organized as follows: The materials and techniques are summarized in Section II; the recommended results and discussion are presented in more depth in Section III. Section III concludes the study and offers suggestions for more research.

1.1 Hypothesis and supporting theory

Safety culture, safety education, and performance

The research on safety performance suggests that a variety of elements, including situational and particular factors, have an impact on Performance, conduct, and results in terms of workplace safety. The foundation paradigm for the suggested concept is workplace safety. The model is based on performance theory. The theory of performance focused on three (03) proximal predictors and three (3) distal precursors of an individual's performance. The individual's abilities, knowledge, and drive to accomplish are considered the proximal determinants.

Distal determinants, on the other hand, include organizational atmosphere, personality, and training. It has been demonstrated that personality and the safety climate have a direct effect on safety knowledge, training, also motivation, and all affect safety performance behavior. In addition to revealing the level of connections that we predicted to exist among different antecedents and safety principles, this hypothetical structure again provides insight into each process by which workplace accidents and injuries take place.

One of the workplace safety performance indicators is the safety atmosphere, and research has examined the connection between the two. According to one definition, the safety atmosphere refers to a group of beliefs that people hold about the problems with organizational safety. The capacity of a concept to forecast safety-related outcomes, including safety performance and behavior, leads to practical and theoretical implications for the workplace safety environment. The first hypothesis may be supported by using the theory of performance to logically connect safety climate with safety performance.

H1: Safety performance is positively correlated with the safety atmosphere.

The proximal determinants of safety-related behavior are safety awareness and motivation, however, were examined in this study following the model, looked at instead of using safety awareness as a proximal determinant, safety training. To achieve superior outcomes and top-notch job performance, safety information must be applied in the workplace after it has been gained. Following the acquisition of training, the transmission of information and training is the first prerequisite. Positive training transfer is defined as the

extent to which learners effectively transfer the skills they acquire during training to their employment.

The significance of safety training in enhancing safety performance has been covered in the research. Said a variety of strategies to increase safety records, among other things is to keep each staff informed about safety and health procedures. For instance, they suggested setting up seminars, meetings, workshops, and on-the-job training regarding safety procedures. The implementation of official Programs for stress management, workplace health, and safety, the usage of safety equipment, also the upkeep of a safe workplace are two further methods. The distal determinants of performance, according to the theory of performance, include training and personality. The hypothesis holds that the safety atmosphere has a direct impact on safety training. Data from the literature demonstrates that safety instruction is a crucial element now recovering and also improving performing safely. There is research conducted to determine each relationship between the environment for safety, safety education, and safety performance, but only a few have focused on the moderator effect of safety training.

H2: The correlation between safety performance and safety climate is moderated by safety training.

The function of safety motivation as a mediator between the safety atmosphere and safety performance
One of the key personality-related factors that influence safety motivation is safety performance. A person's drive to diligently study and engage in safety practices, as well as their passion attached to such activities, are reflected in their safety motivation. Organizations may also increase human safety by creating a setting that encourages people to adopt behaviors that are relevant to safety. Information and talents may not be enough to ensure a person's safety performance in the absence of a supportive environment. Employee motivation is a crucial component of improving safety performance through a positive workplace atmosphere, along with all other commitment-related difficulties. Internal as well as external motivation, intention, and willingness are necessary for performance. Furthermore, according to the theory of performance, safety atmosphere, and motivation are intertwined and, in turn, have a direct impact on safety performance.

H3: Safety performance and safety atmosphere are related through the role of safety motivation.

2 Materials and methods

2.1 Instrumentation

The safety climate questionnaire, the 6-item safety training questionnaire, the 6-item safety motivation scale, and the 12-item safety performance scale were all taken from modified versions. Using a Likert scale from 1 to 5, where 5 represents strongly agreeing, each item was evaluated.

2.2 The sample and the population

The participants in the research paper consisted of employees of the textile dyeing industries in India, just as *Ropaashree et al., 2023*

prior mishaps have shown that safety is a delicate subject in the textile industry. Lower-level employees made up the majority of the sample of textile industry employees because they have greater issues with job safety. Data were gathered using a straightforward sampling method; data collecting is more challenging for businesses at lower levels in particular, and therefore those that respond correctly have an advantage.

Initially, 250 questionnaires were distributed; 200 of them were returned. Twelve of the received questionnaires were found to be lacking information and were therefore excluded from the research. 188 questionnaires total were therefore used in the study. To safeguard their privacy, on the questionnaire, participants were told not to provide their identities or the names of their employers. To ensure that respondents provided truthful answers, the questionnaires were also left unsigned.

2.3 Characteristics of a sample

The instance workers comprised 20% of women and 80% of men. There were surprisingly few women in the sample since it is not viewed favorably for women to participate in any field, particularly at lower levels when labor-intensive activity is necessary. In the case that they were eligible, 2.2% of the respondents possessed a master's degree. Or above, 8.9% had a bachelor's, 15% had an intermediate degree, 40% had a middle degree, and 33.3% had a primary pass.

Due to the lower level of education of entry-level employees and the lack of demand for graduates and master's degree holders in the textile industry, the ratio between a primary pass and a middle pass was higher than that of master's graduate students. 6.7% of people were over the legal drinking age of 50, 28.9% were in the 40–50 range, 37.8% were in the 30–40 range, and 21.1% were under 30. On the other hand, a safe atmosphere has a negative link with safety performance whereas safety motivation and training have a substantial positive correlation. In the broad spectrum, we did not uncover compelling evidence to back up our claim. The initial theory, which looked at the connection between the safety environment and safety performance, was found to be less revealing than prior research.

The rejection of this theory may have this explanation: in India's textile dyeing businesses, safety isn't regarded as a major problem, and higher management isn't especially worried about safety-related concerns at the workplace. This theory is strongly supported by the most recent fire events in India's textile industries. Individuals control their actions in response to the circumstances and clues offered by the environment, according to one possible explanation that may be made in terms of reciprocal determinism. The second hypothesis, which examined how training may influence both the safety environment and performance was also shown to be false. After the data analysis, casual interviews were done to determine each cause of this hypothesis' rejection. The respondents revealed that there is no standard practice to provide training, particularly at the lower levels, in the textile dyeing business.

Although a strategy for training has been included in the documentation, laborers are employed without experience or training at the time of employment. This locks in paperwork in the form of decoration. Informally conducted interviews with respondents also revealed that only a small number of employees have been chosen to participate in training for documentation and evidence that training is conducted as a response to any external pressure on the company. The location of these training courses, how to register, and where to attend these training are unknown to the staff. Hence, the research was unable to determine how the safety climate and safety performance in India's textile dyeing industry were impacted by safety training. The third hypothesis is looked at how safety motivation influences both safety climate and safety performance. The conclusions concur with the observations.

The expectation theory, the self-efficacy theory, and the goal-setting theory are social-cognitive theories of motivation that contend that people adopt self-efficacy views about their behavior, actively establish goals, and practice self-evaluation. In a complex setting full of risks about challenges, people must use moral judgment and restrain their conduct if they are to succeed. Although safety equipment is advised to be used by workers in India's industrial sector, there isn't much of it available.

The primary argument in favor of accepting this theory in the case of India is that it is a developing, collectivist country where people have fewer possibilities to acquire jobs but are still expected to provide for their entire family. People are self-motivated to continue working no matter what in these situations, and they are also driven to employ safety equipment. The study's findings show decision-makers how to improve performance while considering the workplace

safety climate. By planning a series of training, ensuring their effective execution, and fostering a culture of safety at work, they can prevent workplace injuries and accidents.

3. Results and Discussions

The primary goal of this paper was to determine how the textile dyeing industry felt about safety management systems. To draw conclusions and provide helpful recommendations in light of the paper findings, an effort has been made to examine and comprehend pertinent facts. The development of health and safety regulations for employees in the textile industry may benefit from these recommendations.

The linear strength of the link between two variables is gauged by the Pearson correlation. Its values can range from -1 to 1, with -1 denoting an entirely negative linear correlation, 0 denoting an absence of association, and 1 denoting an entirely positive correlation. To assess the associations between a dependent variable and one or more independent variables, regression analysis is a series of statistical techniques used in statistical modeling. The most popular type of regression analysis, known as linear regression, identifies the line that most closely matches the data in terms of a certain mathematical criterion.

Moderation is the term used in statistics and regression analysis to describe situations when a relationship between two variables depends on a third variable (also known as effect modification). The third variable is referred to as the moderator variable or simply the moderator. Interaction in statistics refers to the impact of a moderating variable on research.

Table 1: Correlation using Pearson

	Mean	SD	Safety CLM	Safety TR	Safety MOT	Safety PPER
Safety TR	4.12	0.1172	-0.031	1		
Safety CLM	2.01	0.5148	1			
Safety PPER	1.71	0.2215	-0.014	0.663**	0.927**	1
Safety MOT	3.12	0.5178	0.004	0.663**	1	

Table 2: Analysis of outcomes using regression.

Predictions	a safety record		
	β	R^2	ΔR^2
Step 1 Control Variables		.017	
Step 2 Safety Climate	-.011	.019	.000

Table 3: Results of moderate regression analysis

Predictions	a safety record		
	β	R^2	ΔR^2
Step 1 Controlling factors		0.023	
Step 2 climate for safety Safety instruction	0.005 .661***	0.444	.431**
Step 3 climate for safety Safety instruction	-0.452	0.431	0.000

Table 4: Results of a mediated Regression Study

Predictions	a safety record		
	β	R^2	ΔR^2
Main effect: climate for safety Step 1 Controlling factors		.014	
Step 2 climate for safety	-.011	.014	.000
Mediation: security Inspiration Step 1 Controlling factors		.013	
Step 2 security Inspiration	.924***	.821	.847***
Step 3 climate for safety	-.017	.854	.001

4. Conclusions

These findings contribute to our knowledge of safety-related issues in India's textile sector, but they do have certain shortcomings that need to be addressed by further study. Only a tiny sample of data has been collected; a larger and more diverse sample may be able to provide information about the dangers in India's textile industry. The collection of longitudinal data decisions also does useful. Also, the data was only collected from one site; nevertheless, data from many areas of India may have provided conclusions that were more exciting and trustworthy.

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