Investigating the nexus between safety training, safety rules and procedures, safety performance and protection against hazards in Pakistani construction companies considering its impact on textile industry

The main aim of this research paper is to examine the linkage between safety training, safety rules and procedures, safety performance and protection against hazards in Pakistani construction companies related to its effects on the textile industry. The current study examines the relationship between safety training, safety rules, and procedures and safety performance. A total of 450 workers from 15 companies participated in the study. A questionnaire was used to collect the data. The findings revealed that both safety training and safety rules and procedure were significantly and positively associated with safety compliance. The results propose that construction companies should give proper training to their workers in order to avoid any bad incidents. Similarly, adequate safety rules and procedures are essential for a safer work environment. The textile industry is a very important sector in Pakistan with a significant impact on employment and the labour market.

Keywords: safety training, safety rules and procedures, safety performance, construction companies, workers protection, textile sector

Examinarea conexiunii dintre instruirea în materie de siguranță, regulile și procedurile privind securitatea în muncă, performanța în materie de siguranță și protecția împotriva pericolelor în companiile de construcții din Pakistan, având în vedere impactul acesteia asupra industriei textile

Obiectivul principal al acestei lucrări de cercetare este de a investiga legătura dintre instruirea în materie de siguranță, regulile și procedurile privind securitatea în muncă, performanța în materie de siguranță și protecția împotriva pericolelor în companiile de construcții din Pakistan, având în vedere efectele generate asupra industriei textile. Responsabilitatea principală a organizației este de a oferi angajaților un loc de muncă adecvat în care lucrătorii își desfășoară activitatea în condiții de siguranță. Studiul de cercetare actual examinează relația dintre instruirea în materie de siguranță, regulile și procedurile de siguranță și performanța în materie de siguranță. Un total de 450 de lucrători din 15 companii au participat la studiu. Pentru colectarea datelor a fost folosit ca instrument de cercetare chestionarul. Rezultatele empirice au arătat că atât instruirea în materie de siguranță, cât și regulile și procedurile de siguranță au fost asociate în mod semnificativ și pozitiv cu respectarea/conformarea în materie de siguranță. De asemenea, rezultatele sugerează că firmele de construcții să ofere o instruire adecvată lucrătorilor proprii pentru a evita orice incident cu urmări negative. În mod similar, regulile și procedurile adecvate de siguranță sunt esențiale pentru un mediu de lucru mai sigur. Industria textile este un sector foarte important în Pakistan, cu un impact semnificativ asupra ocupării forței de muncă și a dinamicii pieței muncii.

Cuvinte cheie: instruire în materie de siguranță, reguli și proceduri de siguranță, performanță în materie de siguranță, companii de construcții, protecția lucrătorilor, sectorul textile

INTRODUCTION

Today, there are numerous occupational accidents at the workplace and it is the obligation of the organizations to give a safer workplace to the employees. An occupational accident is defined as an occurrence arising from the course of work, which results in non-fatal or fatal injury [1]. Similarly, an occupational accident is unexpected and unintentional and can result in one or more workers suffering an injury, disease or death [2].

According to Iqbal et al. [3], the textile industry represents “one of the oldest industries in Pakistan” but sustainable development of this sector involves financial and technological investments. Toprak and Anis [4] investigated the impact of the textile industry on the environment and identified certain factors such as discharge chemical loads, energy waste, air pollution, huge chemical and water consumption, solid dissipation and odour emergence. Rempel et al. [5] argued that textile reinforcements do not corrode in contradistinction to ordinary steel reinforcements.
Moreover, Bick et al. [6] discussed low wages of workers and limited working conditions considering the fact that both environmental and social costs related to the textile manufacturing sector are very scattered. Memon et al. [7] argued that the textile industry is an essential pillar of economic growth in Pakistan while the leading components are the following: clothing and garments, ready-made fabrics, weaved apparel, twisting sector and chemical processing sector. Pakistan, which is a developing country, is part of the group of lower-middle-income economies, with a GNI per capita from USD 1036 to USD 4045 [8]. The fact is documented by giving an example of the US, where the expenditure of occupational injuries reached up to $990 million and the expenses may further increase as additional damages occur in other industries. Thus, organizations with a safe work environment have numerous benefits both direct and indirect [9]. Direct one is related to workers who are influenced by occupational injuries and accidents and the organization which bears unnecessary loss [10]. Similarly, indirect relates to families of the employees, insurers, society and consumers [9]. Poor performance relating to occupational safety and health leads to the immeasurable human cost of injuries and fatalities as well as great financial loss of an organization and country. For example, according to the International Labour Organization [11], there were 2.78 million deaths across the globe. Similarly, more than 7500 people die every day, 6500 from work-related diseases and 1000 from occupational accidents. Some of the worst occupational accidents include, the Flixborough Works of Nypro (UK) Limited experienced an extensive vapour cloud blast in which 36 employees were injured and 28 employees were killed [12]. Another accident occurred in Bhopal, India, killing 3,800 people. This accident in India caused major injuries and health-related problems because of the leakage of methyl isocyanate chemicals [13]. Moreover, an effusion occurred at Buncefield Oil Storage Depot in which there were no deaths but 43 people were injured [14].

Due to the huge amount of cost involved in occupational injuries and accidents as discussed above many countries and entities started taking interest in this problem [15]. Economic and workforce loss occur because of occupational injuries and accidents. Companies suffer from direct costs which include death claims, medical fee, legal fee, expenses for safety and health and appliances damage [16]. Similarly, indirect cost also occurs which is sometimes remarkably higher, because indirect costs include disturbance in quality and productivity, employee’s replacement costs, insurance costs and training costs [17]. While both direct and indirect costs are involved, quick action must be taken to stop the occurrence of occupational injuries and accidents. The actions may be the scientific and systematic type to examine that what are the factors that contribute to occupational injuries and accidents so that effective practices and measures can be implemented.

Construction industry faces similar occupational injuries and accidents. Occupational safety and health are significant with respect to the unique nature of working conditions which turn construction workers prone to accidents. As compared to other industries construction industries have a high rate of workplace accidents [18]. The construction industry employed hardly 10% of the working population but contributes 30% of lethal accidents over the European Union (EU), furthermore in the United States (US) it contributes 22% of all deadly accidents among 7% of working persons [19]. According to Haadir and Panuwatwanich [20], up to 25% of accidents arise in the construction industry of the United Kingdom, similarly 40% in Japan and 50% in Ireland construction industries. In the light of literature, specifically, the construction workers working on construction sites have a 1 in 300 chance of killing at the workplace. The ratio of other major illnesses, paralysis and being disabled are very high as compared to other nature of works [21]. These types of injuries consume 4% of the world’s GDP [18]. The developing countries, like India, Sri Lanka and Pakistan, are labour extensive countries that involved 2.5–10 times as many individuals per task [22]. Moreover, in certain Asian economies, most of the population actually has no entrance to quality health care facilities [23]. If we talk about construction injuries in Pakistan it is going higher and higher [22].

The situation is very bad and it needs some sort of precautions that reduce this higher rate (16.28%) of injuries and accidents at the worksites [11]. Therefore, the present study comes up with the contribution to the body on the knowledge that if the top-level management provides appropriate training and apply basic safety rules & procedure then construction injuries and accidents can be reduced.

LITERATURE REVIEW

Safety performance

The degree which explains the level of safety within an organization is called safety performance. It is also known as the annual number of injuries and accidents which describe the safety level of an organization [24]. Similarly, Kohli [25] argued that it is a set of regulations that are used to improve workplace safety. The definitions themselves give the directions for the reduction of workplace injuries and accidents. Safety performance is attached to injuries and accidents rates hence, this study aims to reduce the injuries and accidents at construction sites. Previous studies argued that safety performance is directly associated with injuries rates [26, 27] and it is evident that it leads to the success of the organizations. In this study, safety performance is determined by a factor named safety compliance. Safety compliance is actual rules set by the organization. In addition, it refers to the regulations which are directed by the top management in order to reduce workplace unsecure incidents which leads to accidents [28]. Hence, safety compliance is mandatory to be followed
on construction sites in order to avoid any dangerous incident.

**Safety training**

Training refers to the actions taken by individuals in order to work safely in the organization. The organization which takes adequate work from their workers should train their employees. It is a factor that updates an individual during work time. Goldstein [29] argued it is the attribute that leads to a safer work environment. On the other hand, the importance of ESG factors, which include social, environmental, economic and corporate governance aspects is significant considering the impact on sustainable economic growth [30]. Thus, everyone at the workplace should be trained and able to control any hazard at the workplace. Moreover, safety training is the adequate knowledge that allows the worker to behave safely in order to avoid any uncomfortable situation [31]. Therefore, we propose the following hypothesis: **H1:** Safety training is significantly related to safety performance.

**Safety rules and procedures**

Rules are expectations and procedures which are set by any organization in order to maintain the decorum of the organization. According to Vinodkumar and Bhasi [28], these are well-established procedures in order to maintain the safety of an organization. Lu & Yang [32] argued that these are the actions that we can perform at the workplace. Similarly, it refers to the action from which an organization do accountabilities and manage future goals. Numerous studies are evident about the association between safety rules & procedures and safety performance [28, 32, 33]. Safety rules & procedures play an important role in safety-related outcome therefore we propose that:

**H2:** Safety rules & procedures is significantly related to safety performance.

**DATA COLLECTION AND RESEARCH METHODOLOGY**

The target population of this study are the construction workers from different construction companies operating in Punjab, Pakistan. The reason behind selecting Punjab is that most numbers of the companies are established here. Moreover, Punjab is progressing in order to give employment to individuals coming from other areas. Data was collected personally through self-administered questionnaires. 450 workers from 15 companies participated in the study. The objective of the study was mentioned on the first page of the questionnaires to avoid any inconvenience. The response rate was 83%. The sample consists of (75%) males and (25%) females. The majority of the respondents were married (85%). Similarly, the majority of the respondents were young (91.3%) with less than 40 years of age.

The main questionnaire included the item of safety training, safety rules & procedures and safety performance. The questionnaire was divided into two sections. Section one consists of the demographics whereas section two consists of the items of the variables used in this study (table 1). The questionnaire

![Fig. 1. Research framework](image)

**Table 1**

| Protocols                  | Items                                                                 |
|----------------------------|-----------------------------------------------------------------------|
| Safety performance         | 1. I use all necessary safety equipment’s to do my job.               |
| (Safety compliance)       | 2. I carry out my work in a safe manner.                              |
|                            | 3. I follow correct safety rules and procedures while carrying out my job. |
|                            | 4. I ensure the highest levels of safety when I carry out my job.     |
|                            | 5. Occasionally due to lack of time, I deviate from correct and safe work procedures. |
|                            | 6. Occasionally due to over-familiarity with the job, I deviate from correct and safe work procedures. |
|                            | 7. It is not always practical to follow all safety rules and procedures while doing a job. |
| Safety training           | 1. My company gives comprehensive training to the employees in workplace health and safety issues. |
|                            | 2. Newly recruits are trained adequately to learn safety rules and procedures. |
|                            | 3. Safety issues are given high priority in training programs.        |
|                            | 4. I am not adequately trained to respond to emergency situations in my workplace |
|                            | 5. Management encourages the workers to attend safety training programs. |
|                            | 6. Safety training given to me is adequate to enable me to assess hazards in the workplace |
| Safety rules & procedures | 1. The safety rules and procedures followed in my company are sufficient to prevent incidents from occurring. |
|                            | 2. The facilities in the safety department are not adequate to meet the needs of my company. |
|                            | 3. My supervisors and managers always try to enforce safe working procedures. |
|                            | 4. Safety inspections are carried out regularly.                     |
|                            | 5. The safety procedures and practices in this organization are useful and effective. |
The results showed that both variables (safety training and safety rules & procedures) have been associated with safety performance in the order of safety compliance. Both variables used in the current study are highly significant and positively related to safety compliance. Hence, safety training and safety rules & procedures ($\beta = 0.381$ and $0.337 \ p < 0.000$) were found significant and positive with safety compliance. Therefore, all hypotheses in the present study were supported. The result showed that the construction management should provide appropriate training and apply necessary rules & procedures in order to avoid any bad incident which leads to injuries. In other words, safety training and safety rules & procedures are significantly important for construction sites to be safe from accidents. The result is consistent with the previous study which also put a positive impact on safety compliance [28, 35] which give evidence that both variables of the study are important in accordance with safety compliance (table 4).

Table 2 showed the Cronbach Alpha value of the variable used in the study. Similarly, it also illustrates the sources and number of items incorporated in the study. The following paragraphs will examine the correlation and validity analysis. Table 3 illustrates the mean, standard deviation and average variance extracted of the construct used in this study. If take the average the construction workers showed agreement on all variables used in the study. Hence, it showed the importance and the construction companies should follow these protocols (safety training; safety rules & procedures). Pearson correlation was applied in this study. The correlation of the variable used in this study was at a satisfactory level.

For convergent validity table 3 presents the value of AVE. Each vale of AVE is greater the 0.5 which depicts that all value is satisfactory for convergent validity and goodness of fit of the model.

**EMPIRICAL RESULTS AND DISCUSSIONS**

The results showed that both variables (safety training and safety rules & procedures) have been associated with safety performance in the order of safety compliance. Both variables used in the current study are highly significant and positively related to safety compliance. Hence, safety training and safety rules & procedures ($\beta = 0.381$ and $0.337 \ p < 0.000$) were found significant and positive with safety compliance. Therefore, all hypotheses in the present study were supported. The result showed that the construction management should provide appropriate training and apply necessary rules & procedures in order to avoid any bad incident which leads to injuries. In other words, safety training and safety rules & procedures are significantly important for construction sites to be safe from accidents. The result is consistent with the previous study which also put a positive impact on safety compliance [28, 35] which give evidence that both variables of the study are important in accordance with safety compliance (table 4).

The textile industry is an essential sector and these aspects must be taken into account in order to achieve sustainable development. On the other hand, Spulbar et al. [36] argued that an extreme event, such as a global financial crisis or COVID-19 pandemic is a rare and highly unpredictable event, but very difficult to anticipate and forecast. Memon et al. [7] have highlighted various issues affecting the textile industry of Pakistan such as frail infrastructure,
obsolete technology, adverse law and order situation and lack of investment. The current study represents the new direction in the area of safety management. The present study gives evidence on the association between safety training, safety rules and procedures and safety compliance in a developing country. Whereas, most of the studies were conducted in developed economies. Hence, this study is evidence that safety training and safety rules and procedures do influence safety compliance in developing nations like Pakistan. Therefore, it is expected that the current study fill the gap relating to safety performance literature. Furthermore, this study determined the direct relationship between safety training, safety rules and procedures and safety compliance. For our future research study, it can also be tested with the help of introducing mediators or moderators.

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