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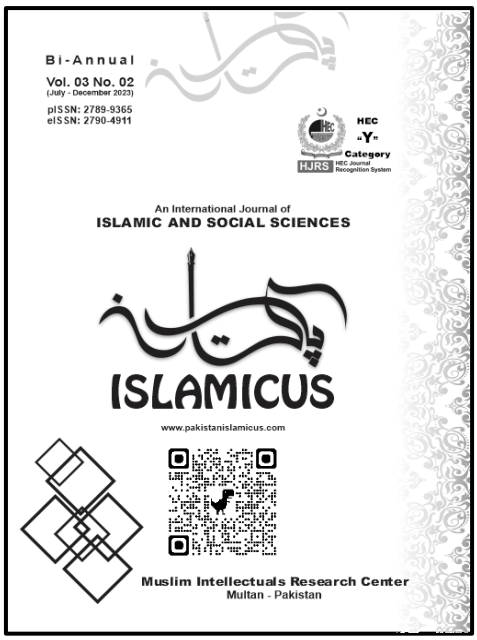

TOPIC

OCCUPATIONAL SAFETY STANDARDS IN THE CONSTRUCTION INDUSTRY: A KAP STUDY FROM DISTRICT LAHORE, PUNJAB PAKISTAN

AUTHORS

Ayesha Siddiqui
MPhil Scholar
Department of Social Work, University of the Punjab, Lahore, Pakistan
khadija_khan@live.com

Muhammad Arshad
Assistant Professor
Department of Social Work, University of the Punjab, Lahore, Pakistan
arshad.dsw@pu.edu.pk

Dr Afzaal Afzal
Department of Social Work, University of the Punjab, Lahore, Pakistan
afzaal.afzal2010@gmail.com

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OCCUPATIONAL SAFETY STANDARDS IN THE CONSTRUCTION INDUSTRY: A KAP STUDY FROM DISTRICT LAHORE, PUNJAB PAKISTAN

Ayesha Siddiqui
M.Phil Scholar, Department of Social Work, University of the Punjab, Lahore, Pakistan
Email: cayesha89@gmail.com

Muhammad Arshad
Assistant Professor, Department of Social Work, University of the Punjab, Lahore, Pakistan
Email: arshad.dsw@pu.edu.pk

Dr Afzaal Afzal
Department of Social Work, University of the Punjab, Lahore, Pakistan
Email; afzaal.afzal2010@gmail.com

Abstract

Occupational safety standards are characterized as a complex set of regulations, procedures, methods, and guidelines that protect workers and ensure their safety at the workplace. These standards are designed to reduce the risk of incidents, injuries, and death in the risky nature of workplaces like the construction industry. Occupational safety standards in the construction industry are significantly associated with the protection of social, physical, psychological, and environmental hazards such as harmful materials, slips and falls, dangerous machinery, long working hours, life & health threats, welfare & basic rights, emergency response & safety tools and compensation among others. This study explores the knowledge, attitude, and practice (KAP) of occupational safety standards in the construction industry in Lahore, with the objective of identifying the factors influencing the KAP of safety standards, the degree to which safety standards are being implemented, and the challenges that workers face in adhering to safety standards. The study employed a mixed-methods approach and primary data was collected through focus group discussions and surveys of 384 respondents. The findings indicated that there is a need for significant improvement in the safety policies and practices in the construction industry. The workers have a low level of KAP and a huge proportion of workers were not following safety protocols.

Keywords: Occupational Safety Standards, Safety at the Workplace, Construction Industry and Safety, Knowledge, Attitude, and Practice of Occupational Safety Standards.

Introduction

Occupational safety standards are characterized as a set of regulations, procedures, and guidelines that protect workers and ensure their safety at the workplace. These standards reduce

the number of workplace incidents, injuries, and deaths among others, especially with the risky nature of workplaces like the construction industry (Samanta et al., 2023; Maqsoom et al., 2023). Occupational safety is also associated with the protection of workers from physical, psychological, and environmental hazards that may arise in the course of their work. These hazards can include exposure to hazardous materials, slips and falls, dangerous machinery, and long hours of work. It is important to protect the health, safety, and welfare of employees in any workplace. Occupational safety measures include providing a safe working environment and ensuring that employees have the necessary tools and skills to complete their tasks safely (Khatiwada et al., 2021).

Occupational Safety is a broad and complex field that encompasses a wide range of safety-related aspects, from ergonomics to hazardous materials (Ullah, 2022). The origins of occupational safety can be traced back to the Industrial Revolution of the 18th century when workers in factories, mines, and other industrial settings began to face a variety of new risks and dangers. In response, the earliest forms of occupational safety regulations were introduced, often in the form of laws or regulations issued by governments (Aghimien, 2023).

Normally, organizations recognize the need for safety at the workplace and take reasonable steps to protect their employees. This can include providing safety training, developing safety policies and procedures, providing personal protective equipment (PPE), and using safe work practices (Tariq et al., 2023). Globally, occupational safety standards are designed to minimize the risk of injury, illness, and death in the workplace and numerous global and local safety standards are adopted accordingly. The Occupational Safety and Health Administration (OSHA) is a leading organization responsible for the enforcement of workplace safety and health regulations. OSHA has developed a comprehensive set of standards that employers must follow in order to ensure their workplace meets the agency's safety requirements (Javed et al., 2020). These standards cover a range of aspects such as hazardous materials, machine safety, electrical safety, and fire safety (Wong et al., 2020).

In addition to OSHA standards, employers can also look to other organizations for guidance on best practices in occupational safety. These organizations include the American National Standards Institute (ANSI), the National Safety Council (NSC), and the Institute of Electrical and Electronics Engineers (IEEE) (Hosseini et al., 2023). For example, ANSI publishes standards for workplace safety in the form of the ANSI/AIHA Z10 standard series. The NSC provides a range of safety resources, including safety training, consulting, and safety-related

products. The IEEE publishes standards for electrical safety, including the IEEE 1320 standard for the safe design and installation of electrical systems (Khanal, 2023).

The development of occupational safety has been a continuous process, with new laws and regulations being introduced as new risks and dangers emerge. Today's occupational safety is an important part of any workplace, and employers have a legal responsibility to ensure that their employees work in a safe and healthy environment (Rahaman et al., 2021). The modern construction industry has evolved from centuries of growth, innovation, and technological advances. As the industry has grown and changed, the need for occupational safety standards has become increasingly important (Dolo et al., 2023). The earliest known safety standards in the construction industry were created in the United Kingdom in the late 19th century. Since then, several countries, including the United States and Canada, have developed and implemented their own safety standards for the construction industry (Maqsoom et al., 2023).

Occupational Safety Standards in The Construction Industry of Pakistan

The construction industry in Pakistan is one of the most hazardous industries and thousands of workers face chronic incidents due to hazardous working conditions (Fatima et al., 2023). The inadequate safety standards in the construction industry are primarily due to the lack of safety regulations and enforcement of them, as well as the use of outdated and unsafe equipment and materials. In addition, hazardous working conditions arise from a lack of education and training of workers, and a lack of understanding of the risks associated with construction activities (Khanal et al., 2021). Lack of enforcement of safety regulations and the lack of adequate safety equipment can also contribute to hazardous working conditions in the construction industry. Many workers are not provided with the necessary safety equipment, such as hard hats, safety glasses, and gloves, or are not trained to use the safety equipment properly. In addition, safety regulations are often not enforced in the construction industry, leaving workers exposed to serious risks (Maqsoom et al., 2020).

The construction industry in Pakistan is one of the most hazardous industries in the world. The hazardous working conditions in the construction industry are primarily due to the lack of safety regulations and enforcement of them, as well as the use of outdated and unsafe equipment and materials (Khadim et al., 2023). In addition, inadequate ventilation and dust in the work environment, risk of electrocution, inadequate lighting and a lack of safety training and certification of workers are all major hazards in the construction industry in Pakistan. It is important that safety regulations are properly enforced and that workers are given the necessary

safety training and equipment to ensure that they are safe while performing their work (Phinias et al., 2023).

The Government of Pakistan has taken several measures to address the challenges associated with occupational safety standards in the construction industry (Olutende et al., 2021). The government has established the National Building Code of Pakistan (NBCP) to provide guidance on the design, construction, and safety of buildings in Pakistan. The code outlines the requirements for safety in construction, including the use of protective equipment, the design of safe structures, and safety training for workers (Sehsah et al., 2020). The government has also established the Pakistan Institute of Safety, Health, and Environment (PISHE) to promote safety in the construction industry. The institute provides training and resources to workers and employers in the construction industry on occupational safety and health (Wong et al., 2023). Additionally, the government has established a national occupational safety and health policy (NOSHP) to ensure that safety standards in the construction industry are met. The policy outlines the responsibilities of employers, workers, and the government in ensuring the safety of workers in the construction industry (Al-Otaibi et al., 2023).

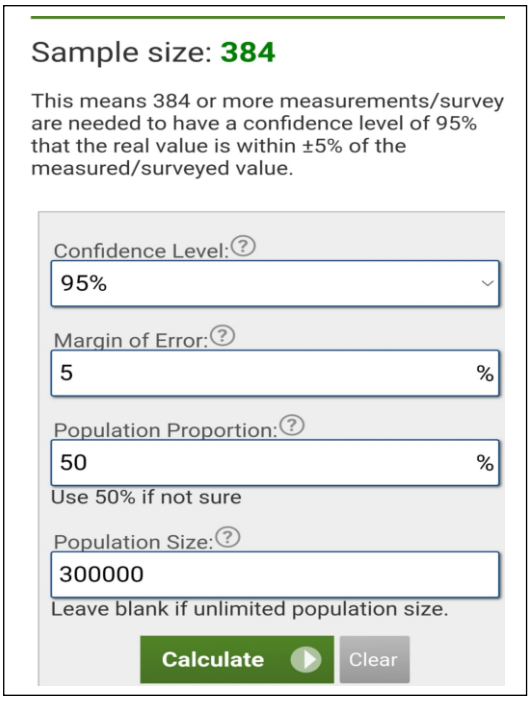
The construction industry in the Lahore district is an integral part of the economy and is subject to various occupational safety standards. This study seeks to explore the knowledge, attitude, and practice of occupational safety standards in the construction industry in the Lahore district (Raza et al., 2023). Specifically, the research aims to identify the factors influencing the knowledge, attitude, and practice of safety standards in the construction industry, the degree to which safety standards are being implemented, and the challenges that workers face in adhering to safety standards (Bajracharya et al., 2023). Additionally, this study will explore the awareness of safety standards among various stakeholders and the role of government in regulating the implementation of safety standards. The results of this study could provide important insights into improving the occupational safety standards in the construction industry in the Lahore district and would help inform policymakers on how to better protect the health and safety of workers in this sector.

Objectives of The Study

1. To investigate the knowledge, attitudes, and practices of workers in the construction industry in the Lahore district regarding occupational safety standards.
2. To assess the attitudes of workers in the construction industry in the Lahore district regarding occupational safety standards.

3. To check the practices of workers in the construction industry in the Lahore district regarding occupational safety standards.

Material and Methods



This empirical study applied a mixed-methods approach to understand the occupational safety standards and practices in the construction industry in Pakistan. The participants were the workers who had worked in the construction industry for six months in district Lahore. On the quantitative side, surveys were conducted to collect information on worker knowledge, attitudes, and practices regarding occupational safety. This included questions on worker awareness of safety procedures, their attitudes towards safety protocols, and their behaviors when it comes to practicing safety on the job. On the qualitative side, 5 focus group discussions were conducted to gain a deeper understanding of workers' experiences and perceptions of safety in the construction industry, as well as to identify potential areas of improvement. Additionally, observations of construction sites were obtained to gain a better understanding of how safety protocols were implemented and how workers interacted with safety equipment and procedures.

According to the Labor Welfare Department of the Government of Punjab, the Bureau of Statistics, and International Labor Organizations, there are approximately 300,000 workers in the construction industry in Lahore, including laborers, engineers, and management. Using an online sample calculator, a sample of 383 respondents was selected from the total population. Since there was no sampling frame, a non-probability method was employed to reach the sample group. Figure 1, shows the total number of sampled populations drawn from the total population. The statistics show that with a 95% confidence level and 5% margin of error, the total sample of 384 respondents was drawn by using an online sample calculator. It was determined that 5 Focus Group Discussions (FGDs) with 8-10 participants each should be conducted for this study, given the size and complexity of the research topic, the availability of participants, and the resources accessible to the researcher. This number is based on the general rule of thumb to aim for a minimum of 3-5 FGDs per research topic.

Considering the nature of the study, multiple tools were used to collect data. Initially, an interview guide was used to obtain information related to the knowledge, attitude, and practices of construction workers on occupational safety. Focus group discussions were conducted with four groups of workers, and on the basis of the findings of FGDs, a structured questionnaire was developed to conduct KAP study on occupational safety involving a maximum number of participants from the existing study population. The data for this study was collected from three sources such as FGDs, surveys, and document analysis.

The data collected from the interviews, observations, and document analysis was analyzed using thematic analysis. The data was coded and analyzed for themes related to the research questions. Ethical considerations were taken into account in this research. All participants were informed of the purpose of the study and their confidentiality was respected. Informed consent was obtained from the participants before the interviews and observations conducted.

Results and Major Findings

For comprehensive discussion and coherent understanding of the study, the results are presented in quantitative as well as qualitative form. Quantitative analysis is presented in the form of numbers and percentages. Table 1 presents information regarding safety training for employees

Table 1 Characteristics and existing situation of occupational safety standards

		N	%	Valid %	Cumulative %
Safety training and instruction	Strongly disagreed	45	11.72	11.72	11.72
	Disagreed	121	31.51	31.51	43.23
	Neutral	14	3.65	3.65	46.88
	Agreed	99	25.78	25.78	72.66
	Strongly agreed	105	27.34	27.34	100.00
	Total	**384**	**100**		
Availability of appropriate safety equipment	Strongly disagreed	109	28.39	28.39	28.39
	Disagreed	78	20.31	20.31	48.70
	Neutral	10	2.60	2.60	51.30
	Agreed	99	25.78	25.78	77.08
	Strongly Disagreed	88	22.92	22.92	100.00
	Total	**384**	**100**		
Awareness of health and safety responsibilities	Strongly disagreed	123	32.03	32.03	32.03
	Disagreed	45	11.72	11.72	43.75
	Neutral	12	3.13	3.13	46.88
	Agreed	110	28.65	28.65	75.52
	Strongly Disagreed	94	24.48	24.48	100.00
	Total	**384**	**100**		

Results presented in Table 1 revealed the mixed response from the field as the largest portion 31.51% of participants disagreed regarding the provision of adequate safety training and instruction to employees and 27.34% strongly agreed. When the participants were asked about the availability of appropriate safety equipment out of a total 28.39% strongly disagreed and only 22.92% strongly agreed. Similarly, when workers were asked about their health and safety responsibilities 32.03% of those surveyed strongly disagreed, 11.72% disagreed, 3.13% were neutral, 28.65% agreed, and 24.48% strongly agreed. In total, 75.52% of those surveyed either agreed or strongly agreed with the statement.

Table 2 Characteristics and existing situation of occupational safety standards

		N	%	Valid %	Cumulative %
Risk assessment system at the workplace	Strongly disagreed	98	25.52	25.52	25.52
	Disagreed	56	14.58	14.58	40.10
	Neutral	11	2.86	2.86	42.97
	Agreed	123	32.03	32.03	75.00
	Strongly Disagreed	96	25.00	25.00	100.00
	Total	**384**	**100**		
Availability of first aid kits for workers	Strongly disagreed	94	24.48	24.48	24.48
	Disagreed	108	28.13	28.13	52.60
	Neutral	12	3.13	3.13	55.73
	Agreed	98	25.52	25.52	81.25
	Strongly Disagreed	72	18.75	18.75	100.00
	Total	**384**	**100**		
Incidents reported at the workplace during the last six months	Strongly disagreed	97	25.33	25.33	25.33
	Disagreed	65	16.97	16.97	42.30
	Neutral	12	3.13	3.13	45.43
	Agreed	112	29.24	29.24	74.67
	Strongly Disagreed	97	25.33	25.33	100.00
	Total	**383**	**100**		

Table 2 presented outcomes regarding the risk assessment system at the workplace, results revealed that 25.52% of the respondents strongly disagreed that there is a risk assessment system and 25.00% of the respondents strongly agreed. The cumulative percentage of agreement was 75.00%. The participants reported about the availability of first aid kits for workers and 24.48% of the respondents strongly disagreed with the statement, 28.13% disagreed and only 18.75% strongly agreed. Overall, most respondents disagreed or were neutral about the statement, with 81.25% of the respondents not agreeing with it. Similarly, 25.33% of the respondents strongly disagreed that the incident happened at the workplace

29.24% of the respondents agreed, and 25.33% of the respondents strongly agreed. The cumulative percentage of agreement was 74.67%.

Table 3 Characteristics and existing situation of occupational safety standards

		N	%	Valid %	Cumulative %
Access to medication in case of accident, injury, or illness	Strongly disagreed	111	28.91	28.91	28.91
	Disagreed	76	19.79	19.79	48.70
	Neutral	6	1.56	1.56	50.26
	Agreed	98	25.52	25.52	75.78
	Strongly Disagreed	93	24.22	24.22	100.00
	Total	**384**	**100**		
Emergency response at the workplace	Strongly disagreed	105	27.34	27.34	27.34
	Disagreed	81	21.09	21.09	48.44
	Neutral	6	1.56	1.56	50.00
	Agreed	97	25.26	25.26	75.26
	Strongly Disagreed	95	24.74	24.74	100.00
	Total	**384**	**100**		
Compensation in case of incidence of long-lasting injury or death	Strongly disagreed	145	37.76	37.76	37.76
	Disagreed	34	8.85	8.85	46.61
	Neutral	6	1.56	1.56	48.18
	Agreed	107	27.86	27.86	76.04
	Strongly Disagreed	92	23.96	23.96	100.00
	Total	**384**	**100**		

The results presented in Table 3 highlighted the access to medication in case of accident, injury, or illness and 28.91% of the workers strongly disagreed with the statement, 19.79% disagreed while only 24.22% strongly agreed. When the respondents asked about the emergency response at the workplace 27.34% of respondents strongly disagreed, 21.09% disagreed and only 24.74% strongly agreed. Overall, the majority of respondents were not satisfied with the emergency response protocols in place at their workplace. When the respondents were asked about compensation in case of serious injury or death 37.76% of respondents strongly disagreed and only 23.96% reported strongly agreed.

Major Findings from Focus Group Discussions (Qualitative)

Knowledge of Occupational Safety in the Construction Industry

The study sought to examine the knowledge of workers about occupational safety in the construction industry in District Lahore. 5 FGDs were conducted to understand the present level of knowledge, attitudes, and practices of construction workers regarding occupation

safety. The majority of workers did not have a basic knowledge of the safety requirements, safety regulations, safety precautions, and safety equipment. Workers were found to be unaware of the risks associated with their jobs, such as the potential for falls, electric shock, and other accidents.

Findings revealed that the majority of workers had a general understanding of occupational safety in the construction industry, but lacked an in-depth knowledge. There was a lack of awareness among workers about the existence of safety committees and the role of safety officers. Only a handful of workers were aware of the need to form a safety committee and the role of safety officers in overseeing safety. The majority of workers also lacked an understanding of the safety training that needs to be provided to workers.

Availability of Proper Personal Protective Equipment (PPE)

The construction industry is known to be a hazardous working environment, with workers facing a variety of dangers and risks. These dangers include falls, hazardous materials, and dangerous machinery. As a result, it is essential to provide workers with proper personal protective equipment (PPE) to protect themselves from such hazards. PPE is a special type of equipment designed to protect workers against physical, chemical, and biological hazards in the workplace. It is essential that workers have access to the appropriate PPE for the job they are doing, as inadequate or inappropriate PPE can lead to serious injury or even death. The results of the study indicated that the majority of workers in District Lahore didn't have access to proper PPE. The most common type of PPE available was hard hats, followed by safety glasses, and dust masks. However, other types of PPE such as respirators, ear protection, and protective clothing were not widely available. Only a few workers had access to respirators, while only a few had access to ear protection. Furthermore, a limited number of workers had access to protective clothing.

Risk Assessments

Employers must assess the risks posed by the construction project and implement measures to reduce those risks. This includes identifying potential hazards, providing appropriate training, and putting into place effective safety procedures. The major finding of the study was that a majority of the workers had not undergone any risk assessment training prior to commencing work at their construction sites. This lack of training left them vulnerable to potential risks and hazards, as they were not aware of the potential risks and how to protect themselves. The study also found that the levels of risk posed to workers varied depending on the job they were performing. For example, workers in the demolition and excavation departments were found

to be more at risk of injury or illness due to the hazardous nature of their work. Similarly, workers in the electrical, plumbing, and carpentry departments were found to be more at risk due to their potential exposure to hazardous materials.

Hazard Communication

Employers are required to provide workers with information and training on the hazardous chemicals and substances they may be exposed to on the job. Employers must provide adequate safety training to all employees, including general safety and specific safety training related to the job. Hazard communication is an integral part of safety management in the construction industry globally. It ensures that workers are aware of the health and safety hazards associated with the construction work they are undertaking. The results showed that many workers had received some form of hazard communication, mostly in the form of verbal information. However, only 12% of the workers had received both written and verbal communication of the hazards associated with their work.

Regular Safety Inspections

The respondents were asked about the Regular Safety Inspections for occupational safety in the construction industry. In this context, the findings of the study revealed that most of the construction sites had not undergone any regular safety inspections in the past one year. Only a few sites had undergone regular safety inspections. The majority of FGD participants reported that most of the construction sites had no safety inspections from their respective government departments. Few of the sites were reported better in this regard as they had received safety inspections from their respective government departments. The overall findings of the study revealed that regular safety inspections were not being conducted in district Lahore and the majority of the workers were not aware of the safety regulations and guidelines.

SOPs to Deal with Emergency Situations in the Construction Industry

The findings of the study revealed that the SOPs used to deal with emergency situations in the construction industry in District Lahore were either unavailable or inadequate. Most of the respondents reported that the SOPs used in their organizations were outdated and not in line with the current safety regulations. Furthermore, the respondents reported that the SOPs were not updated or reviewed regularly and the training of workers on the SOPs wasn't conducted in the majority of cases, or inadequate training imparted in this connection. The respondents also reported that the emergency SOPs were not properly implemented while the lack of coordination between the different stakeholders involved in the construction process was found weak.

Accident Reporting Mechanism in The Construction Industry

Accident reporting is an important mechanism in the construction industry as it helps to identify and prevent workplace accidents, reduce losses, and ensure the safety of workers. An effective accident reporting system helps to ensure that safety standards are followed and that lessons are learned from accidents that have occurred. In the study, it was also aimed to assess the availability and effectiveness of the accident reporting mechanism in the construction industry in Lahore District, Pakistan. The results showed that the majority of construction workers in the Lahore District have either no or poor knowledge of the accident reporting mechanism. There was confusion among workers regarding the process and requirements for reporting accidents and a lack of understanding of the importance of reporting incidents, leading to a lack of accountability among workers. The research findings also identified that the accident reporting mechanism was not used properly due to the lack of clear guidelines for workers on how to report accidents and a lack of training on how to use the system. Further, workers reported that the reporting process was lengthy and complicated, which was a major discouraging factor for the usage of such reporting accidents.

Tool Maintenance for Occupational Safety in The Construction Industry

Tool maintenance has always been an important component of occupational safety in the construction industry. Poorly maintained tools can cause serious injuries and even death. The respondents were also asked about the practice of tool maintenance. The findings of the study indicated that the current practices in tool maintenance were inadequate in many respects. It was found that most of the construction workers were not aware of the importance of tool maintenance and didn't take proper care of their tools. The main reason for this was again the lack of knowledge about the proper maintenance of tools. Many workers didn't understand the importance of regularly checking their tools for wear and tear, and they often didn't replace broken or worn parts on time. In addition to this, the workers didn't have access to the right tools and equipment which is necessary to carry out proper maintenance.

Discussion

The focus group discussions and survey findings both show that the safety policies and practices in the construction industry in District Lahore need improvement. The focus group discussions revealed that the workers had low overall knowledge of occupational safety and lacked knowledge of safety regulations, precautions, and equipment. Most workers were not following safety protocols, such as using proper personal protective equipment (PPE) and protecting themselves from hazardous materials. Additionally, the survey indicated that the

company's health and safety policies require significant improvement. Less than half of the respondents were satisfied with the comprehensive written health and safety policy for workers in the construction industry. The survey results also suggest that regular safety checks and inspections on construction sites, maintenance of premises, tools, and equipment, and regular filing of accident and incident reports and near-miss reports are not being adequately conducted. Although most workers were aware of safety procedures and potential hazards on the construction site, there are concerns about the protocols in place for working in confined or hazardous areas, lack of trust or transparency between workers and employers, and issues with enforcing safety protocols. The majority of workers agreed that the company/contractors ensure that safety protocols are followed on the construction site, but there is a need for regular safety training and communication between workers and employers to ensure that workers are aware of potential hazards on the construction site.

Conclusion

In conclusion, measures should be taken to improve the risk assessment protocols of the construction industry in District Lahore, in order to ensure the safety of workers and reduce the risk of injury or illness. Companies in the construction industry need to prioritize the maintenance of premises, tools, and equipment, regular filing of accident and incident reports and near-miss reports, regular safety checks and inspections on construction sites, and the establishment of safety committees in the workplace. Employers should also ensure that workers have access to appropriate PPE and undergo risk assessment training before commencing work at their construction sites. The findings of both the focus group discussions and survey highlight the importance of regular safety training and communication between workers and employers to ensure that safety protocols are followed consistently and that workers are aware of potential hazards on the construction site.

Recommendation

By implementing these recommendations, the construction industry in District Lahore can improve its safety policies and practices and ensure the safety of workers. This will ultimately lead to a more productive and efficient workforce, reduced absenteeism and injuries, and lower costs associated with accidents and compensation claims. Based on the findings of the research regarding the safety policies and practices in the construction industry in District Lahore, the following recommendations are suggested:

- Companies in the construction industry should prioritize the improvement of their safety policies and practices, including the establishment of safety committees in the workplace and the maintenance of premises, tools, and equipment.
- Regular safety checks and inspections should be conducted on construction sites to ensure that safety protocols are being followed, and any hazards are identified and addressed promptly.
- Regular filing of accident and incident reports and near-miss reports should be conducted to monitor safety performance and make improvements where necessary.

Recommendation for Government

- Develop and enforce regulations for safety policies and practices in the construction industry, including risk assessment protocols, safety checks, and inspections, maintenance of premises, tools, and equipment, and filing of accident and incident reports and near-miss reports.
- Increase public awareness and education campaigns to improve workers' knowledge of occupational safety and health, safety regulations, precautions, and equipment.
- Increase the number of safety inspectors to ensure compliance with safety regulations and protocols.
- Establish safety committees in the workplace to improve communication between workers and employers, and provide a platform for workers to report safety concerns.

Implications for Research

- Further research: Conduct further research to explore the factors influencing the low knowledge of occupational safety among workers and their non-compliance with safety protocols.
- Evaluate existing training programs: Evaluate the effectiveness of current training programs on occupational safety in the construction industry and identify areas for improvement.
- Study the impact of safety policies: Conduct research to study the impact of safety policies and practices on the overall health and well-being of workers in the construction industry in District Lahore.
- Analyze the role of employers: Analyze the role of employers in promoting and enforcing safety policies and practices in the construction industry in District Lahore.

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