



# A Study on Exploring the Causes and Challenges in Preventing Occupational Injuries

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## ABSTRACT

This study delves into the multifaceted aspects of workplace safety to understand the underlying causes and challenges associated with preventing occupational injuries. The study aims to identify the prevalent physical hazards in workplaces, evaluate the effectiveness of safety training programs, assess the impact of regulatory inspections and enforcement, and examine the adequacy of personal protective equipment (PPE) provision and usage. Utilizing a mixed-methods approach, including surveys and interviews with employees across various industries, the research uncovers significant gaps and concerns in hazard identification and management, safety training, regulatory oversight, and PPE provision and compliance. The findings highlight the need for organizations to prioritize and invest in robust safety management systems, foster strong leadership commitment to safety, promote employee engagement and participation in safety initiatives, and actively collaborate with regulatory agencies and stakeholders to create a safer and healthier work environment for all employees. The study concludes with recommendations for enhancing workplace safety practices, improving regulatory compliance and enforcement, and fostering a culture of continuous improvement and innovation in occupational injury prevention.

Keywords: physical hazards, training programs, regulatory inspections and enforcement, personal protective equipment (PPE), safety improvement measures.

## 1. INTRODUCTION

Occupational injuries pose significant challenges to the safety, well-being, and productivity workers across various industries, including the rubber and plastic products manufacturing sector. These injuries not only result in human suffering but also incur substantial economic costs for companies due to medical expenses, compensation claims, and reduced efficiency. Understanding the underlying causes and challenges in preventing these injuries is paramount for ensuring a safe working environment and enhancing operational effectiveness. Occupational injuries refer to injuries that occur as a result of or during the course of employment activities. These injuries can occur in various work settings and can range from minor cuts and bruises to severe and life-threatening injuries. Occupational injuries can be caused by accidents, exposure to hazardous materials or conditions, repetitive motion, over exertion, or other work-related factors. The prevention of occupational injuries is a critical concern for employers, employees, and regulatory bodies to ensure a safe and healthy work environment.

## 2. LITERATURE REVIEW

**A study on global occupational safety and health practice and accidents severity by Kassu Jilcha, Daniel Kitaw (2016)** - This literature review focuses on researches undertaken since 1980s onwards. The purpose of the study is to identify existing gaps on workplace safety and health management and propose future research areas. The review adds value to existing electronic database through integration of researches' results. To identify existing gaps, a systematic literature review approach has been used. The reviews were undertaken through keywords and safety related topics. In the literature, various characteristics of workplace safety and health problems were found emanating from the lack of operational activities of the employees, internal working environment and external environment those impose hazards on employee temporarily, permanently and on working environments.

**A study on Industrial Accidents and their Prevention of Satluj Jal Viduat Nigam Limited, Shimla, Himachal Pradesh by Ashok Kumar (2016)** - This paper investigated reasons of industrial accidents in Satluj Jal Viduat Naigam Limited (SJVN), Shimla, Himachal Pradesh and alternative ways to resolve them. This study collected information from purposively selected fifty (50) employees with the help of questionnaire. The study was conducted in SJVN Ltd Company which is situated in Shimla (H.P.). From the statistical findings, it may be concluded that emerges that though there are variations in rate of accidents among the respondents across demographic variables- gender, education, experience, yet these are not associated with industrial accidents as the value of chi-square was not statistically significant on statistical scale. It means there is something else beyond these factors which may

account for accidents and needs to be probed. It may be suggested that the company need to work much on preventives measures, mitigating various risks and focus on satisfaction of the employees to prevent accidents.

**A retrospective study about the trend analysis of Industrial accidents in Pakistan by Abbas, Mohsin, and Balkhyour A. Mansour (2017)** - Occupational accidents in developing countries like Pakistan are obvious due to poor occupational health safety infrastructure. Objective: This retrospective study aimed to analyze the industrial accidents in factories of Pakistan during 1993-2009. Methods and Material: An index value calculation method used to investigate the trends of occupational accidents. Accident rate (103), fatal accident rate (105), and non-fatal accident rate (103) were also calculated. Pakistan Statistical Year Books published by Pakistan Bureau of Statistics (PBS) used as data source. Results: Data of total 10330 industrial accidents analyzed and decreasing accident rate found with average 3.1 accident per 103 factory workers. Fatal accident increased with an average of 23 fatal accidents per 105 factories workers. Regarding the severity of industrial accidents, minor accidents found at 74% followed by serious (18%) and fatal accidents (8%). Decreased trends of index values and accident rates can associate with the increased human development index of Pakistan, but increased fatal accidents in factories and under-reporting are major areas of concern for safety stakeholders.

**A study on measures and challenges in preventing industrial accidents by Tarun.G ,Dr.Murugan Ramu (2018)** - Industrial accidents are the bane of any industry. An industrial accident is the sudden and unexpected change in the working order. Such accidents lead to physical or mental occupational injury to the workers or employees. Injury to the worker or the employee means any bodily injury, exposure to disease or something's death. Hence the industry undertakes several safety measures to prevent and initiate damage control for the incident. By taking such safety measures, the industry is less likely to face any legal consequences, generate a good reputation against its competitors, encourage employees to work with higher productivity and ultimately reduce employee turnover rate. The industry undertakes preventive and safety measure by enforcing proper and efficient safety protocols, proper selection of employees, implementation of incentives for accident free days, proper and regular maintenance of machinery, equipment and infrastructure facilities and through training the employees in safety measures. In this context, the present study shows the various safety and preventive measures taken by the industry to protect and ensure safety to the employees and the challenges faced by the management in the process of implementation of such measures.

**Analysis of Circumstances and Causes of Accidents in a Selected Industrial Undertaking by Pałęga, Michał, and Marcin Knapinski (2019)** - The subject of this publication is to analyze the circumstances and causes of accidents at work in a selected industrial enterprise that provides services in the field of waterjet cutting and laser beam. The paper presents the statutory definition of an accident at work and its basic categories (light, heavy, mortal and collective accident). It also discusses the most popular accident investigation method – the TOL method, which classifies the causes of accidents into three basic groups: material-technical, organizational and human. In the further part of the work the characteristics of the waterjet operator's work station were made, including the scope of activities, possible occupational hazards and preventive actions. Next, the results of the analysis of the circumstances and causes of accidents at work were presented. In the period from 2013 to 2018 eight accidents were reported, resulting in minor injuries, such as cuts and cuts, fracture of the phalanx, overloading of the spine, leg twisting or knee injury.

**A study on Regulatory interventions and industrial accidents by Ramesh Kumar Behera , Izhar Hassan (2019)** - Despite best efforts to minimize risk in organizations, accidents appear almost unavoidable due to various reasons. In India and other parts of the world industrial accidents are investigated to know the causes so that recurrence can be minimized by designing adequate preventive measures. The mineral rich state of Odisha (India), known as a hub for Iron & Steel industries, witnessed frequent accidents during 2005–2009. This article based on study of 982 fatal 'factory-accidents' occurred during 2001–2016, discusses the 'turnaround-story' resulting in reduction of fatal accident from 122 in 2009 to 45 in 2016. The paper examines the type of accidents, industries and distribution of the year; role of climate and harsh weather conditions on accident causation; impact of regulatory interventions in reducing accidents. Software such as R, SQL, MS-Excel and Tableau were used for analysis of data. The study indicates that preventive enforcement based on learning from experience can be considered as an effective method to improve occupational safety and minimize employment injury in the journey towards 'Vision Zero' goal.

**A study on the causes of occupational accidents in manufacturing companies by Abolfazl Ghahramani, Ahad Amirbahmani (2021)** - The main aim of this study was to assess the contributing causes of occupational accidents using a questionnaire. Methods: A total of 365 managers and employees participated in the current study from 9 manufacturing companies located in the northwest of Iran. A questionnaire comprising 100 accident causes was used to gather the required data for this study. Results: Exploratory factor analysis (EFA) yielded 14 factors contributing to accidents, and confirmatory factor analysis found satisfactory fit indices for the EFA model. The participants reported unsafe acts as the most important factor for the occurrence of accidents. A t-test revealed that participants who received safety training experienced fewer occupational accidents than other respondents. The one-way analysis of variance showed that the companies significantly differed in the perception of accident causes. Structural equation modeling indicated that organizational- managerial factors had a larger effect on individual factors than external factors. Conclusion: The results indicate that providing safety training is necessary to control the employees' unsafe acts. The findings of this study might help the managers to develop more targeted countermeasures for reducing occupational accidents.

**A study on Industrial Accidents & Safety Management by Mudit M. Saxena (2021)** - Industrial Safety Management is very crucial to the continued existence of any industry. This is because when accident occurs often in an industry, such industry can fold up. Hence, it is paramount for every industry to have a good industrial safety management program in order to prevent accident. The safety and productivity of people, machines, and processes is a key element of any sustainable business. Industrial safety systems have been used for many years to perform safety functions in the manufacturing industries. In most situations, safety is best achieved by inherently safe process design, Protection layer systems such as sensors, alarms, and personal protection equipment. These may be combined with protective systems to address any residual identified and counter risk. This high level

of safety helps protect personnel, the Environment, and assets while maintaining maximum uptime and minimal operational disruption. Safety guidelines are recommended by the Occupational Safety and Health Administration and other organizations and experts in the era of Covid-19 pandemic.

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### 3. NEED OF THE STUDY

Occupational injuries continue to be a significant concern across various industries worldwide, leading to physical and psychological harm to employees, reduced productivity, increased costs for employers, and societal burden. Despite advancements in safety regulations, technologies, and training programs, preventing occupational injuries remains a complex challenge. Therefore, there is a pressing need for a comprehensive study to explore the underlying causes and challenges associated with preventing occupational injuries to develop effective prevention strategies and interventions. Assessing the effectiveness of existing safety protocols, training programs, and preventive measures is essential to identify gaps and areas for improvement. Despite advancements in safety regulations, technology, and training programs, occupational injuries remain a prevalent and costly issue for organizations and society as a whole. Therefore, there is an urgent need for a comprehensive study to explore the underlying causes and challenges associated with preventing occupational injuries.

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### 4. OBJECTIVES OF THE STUDY

To Identify specific physical hazards present in various types of workplaces. To Analyze training programs to determine their adequacy in promoting safety awareness and skills among employees. To Assess the effectiveness of regulatory inspections and enforcement actions in improving workplace safety. To Evaluate the utilization of personal protective equipment (PPE) and its impact on employee safety. To suggest measures to improve the safety at work place.

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### 5. SCOPE OF THE STUDY

This study aimed at Analyzing accident and injury data to determine the most common types of physical hazards leading to occupational incidents. It also focus on Assessing the employees perceptions and experiences regarding the quality and relevance of safety training received. This study aimed at Assessing employees adherence to PPE usage guidelines and the correlation with the incidence of workplace accidents and injuries. It focus on Analyzing data on the frequency and outcomes of regulatory inspections conducted by relevant agencies. It also Assess the impact of safety improvement measures on reducing workplace accidents, improving safety culture, and promoting employee well-being.

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### 6. RESEARCH METHODOLOGY

**DESCRIPTIVE RESEARCH:** Descriptive research describes the state of affairs, as it exists at present. Descriptive research includes surveys and fact-finding inquiries of different kinds So Descriptive Research design is selected for this project.

#### SAMPLE SIZE

Sample size = 180

Sample size is a critical consideration in research and refers to the number of individuals, items, or data points you select from a larger population to represent that population. The appropriate sample size depends on various factors, including the research objectives, level of confidence, margin of error, and the characteristics of the population.

$$n = (Z^2 * (PQ)) / E^2$$

- n is the required sample size.
- Z is the Z-score corresponding to your desired confidence level.
- p is the estimated proportion of the population with the characteristic of interest.
- E is the margin of error.

$$n = (1.962 * (0.866 * 0.13)) / 0.052$$

$$n \approx 180$$

#### DATA COLLECTION

Data collection is a systematic approach to gathering information from a variety of sources to get a complete and accurate picture of an area of interest. In this study responses are collected through two different sources they are primary data and secondary data

#### TEST OF NORMATIVE

From the analysis it is founded that normative test for my raw data that is the data is not normally distributed i.e p value  $<.05$  so I go with Non-parametric test

- Percentage analysis
- Normality Test
- Non-Parametric Test
- Chi – square test.

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## 7. FINDINGS

It is found that majority of the respondents are male(63%). It is inferred that most of the respondents belong to the age group between 25-30 years(34%) and meagre of the respondents belong to the age above 30 years(5%). It is found that most of the respondents belong to others category such as schooling and illiterates and meagre of the respondents are post graduate. It is found that majority of the respondents belong to the category 1 to 5 years of experience and meagre of the respondents belong to the category more than 10 years of experience. It is found that majority of the respondents feel safe from the physical hazards(96%). It is found that majority of the respondents sometimes encounter physical hazards and meagre of the respondents frequently encounter physical hazards in their work place. It is found that most of the respondents have uncertain or mixed perceptions among employees regarding the effectiveness of hazard identification and management in the workplace(39%) and meagre respondents believe that physical hazards in their workplace are not effectively identified and managed(3%). It is found that most of the respondents neither agreed nor disagreed regarding the safety measures implemented to mitigate physical hazards in the workplace (43%) and meagre of the respondents lack confidence in the effectiveness and adequacy of the safety measures implemented to mitigate physical hazards in the workplace(4%). It is found that majority of the respondents receive adequate training for safety in their workplace(91%). It is found that majority of the respondents are neither satisfied nor dissatisfied with the current training program(57%) and meagre of the respondents are not satisfied with the training program(17%). It is found that most of the respondents have a positive perception of the organization training program(34%) and meagre of the respondents strongly believe that the training program provided by the organization does not adequately prepare them to handle safety procedures(2%). It is found that most of the respondents are uncertain about the regular updating and relevance of the safety training provided by the organization(38%) and meagre of the respondents strongly believe that the safety training provided by the organization is not regularly updated(2%). It is found that majority of the respondents feel confident in the effectiveness of regulatory inspections(89%). It is found that majority of the respondents sometimes observe regulatory violations(58%) and meagre of the respondents frequently observe regulatory violations in their workplace(19%). It is found that most of the respondents are neither strongly in agreement nor in disagreement about the effectiveness of regulatory inspections in enhancing workplace safety(44%) and meagre of the respondents strongly believe that regulatory inspections do not effectively contribute to the safety of their workplace(5%). It is found that majority of the respondents are undecided or have mixed feelings about the necessity of regulatory enforcement actions in ensuring compliance with safety regulations in the workplace(84%) and meagre of the respondents do not perceive regulatory enforcement actions as necessary or effective in ensuring compliance with safety regulations(2%). It is found that majority of the respondents feel that they are being provided with adequate personal protective equipment(91%). It is found that majority of the respondents feel neither comfortable nor uncomfortable wearing the personal protective equipment(58%) and meagre of the respondents feel uncomfortable wearing the personal protective equipment(15%). It is found that most of the respondents agreed that they consistently use appropriate personal protective equipment as required by safety guidelines(37%) and meagre of the respondents strongly believe that they do not consistently use appropriate PPE as required by safety guidelines(2%). It is found that most of the respondents neither agreed nor disagreed about the impact of providing adequate PPE on reducing the risk of accidents in their workplace(42%) and meagre of the respondents believe that the provision of adequate PPE significantly reduces the risk of accidents in the workplace(3%). It is found that majority of the respondents feel that safety improvement measures are actively implemented in their workplace(94%). It is found that majority of the respondents feel that safety improvement measures are somewhat effective(56%) and meagre of the respondents feel that safety improvement measures are not effective(20%). It is found that most of the respondents have a neutral perception regarding the active encouragement and implementation of safety improvement measures(38%) and meagre of the respondents have expressed that safety improvement measures are not actively encouraged and implemented in their workplace(2%). It is found that most of the respondents have neither agreed nor disagreed regarding the effectiveness of safety improvement initiatives in reducing the likelihood of accidents in the workplace(43%) and meagre of the respondents strongly believe that safety improvement initiatives have effectively reduced the likelihood of accidents in the workplace(4%).

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## 8. CONCLUSION

In the study exploring the causes and challenges in preventing occupational injuries, several key findings emerge that underscore the complexities of workplace safety. The majority of respondents reported encountering physical hazards in their workplaces, and a significant number expressed concerns about the effectiveness of hazard identification and management. Furthermore, there was a notable lack of confidence in the safety training provided by organizations, indicating potential shortcomings in the preparation of employees to handle safety procedures. Regulatory oversight and enforcement also received mixed reviews, with employees questioning their effectiveness in ensuring workplace safety and compliance with safety regulations. Personal protective equipment (PPE) provision and usage were identified as critical areas of concern, with many employees reporting inadequate PPE provision

and inconsistent usage. Additionally, while safety improvement initiatives were generally perceived positively, there was a clear need for more active promotion and implementation of these measures in the workplace to effectively reduce the likelihood of accidents.

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