



ANALYSIS OF HEALTH HAZARDS AND SAFETY MANAGEMENT IN CONSTRUCTION INDUSTRY

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ABSTRACT The building industry's contribution to economic development benefits every nation on the planet greatly. Due to its labor-intensive nature, construction work presents employment opportunities for numerous trained, semi-skilled, and unskilled workers. The purpose of this study is to evaluate how well construction sites manage worker health and safety. It aims to identify the scope and causes of occupational illnesses, accidents, and fatalities as well as the difficulties in managing occupational safety and health on building construction sites. Lack of a safety and health policy, a lack of personal protective equipment, inadequate training, a shortage of safety and health specialists, and inadequate risk assessments are the main barriers to managing occupational safety and health on construction sites. A systematic approach to labor inspection is also lacking, and occupational accidents are not accurately reported or recorded. To address the occupational safety and health issues that face workers on building construction sites, it is absolutely essential to provide welfare facilities, personal protective equipment, and worker training on safety procedures. By implementing current legislation and creating occupational safety and health regulations, the government must show its political commitment.

KEYWORDS : Health, Safety, Accidents, Inspection, Personal Protective Equipment, Training.

INTRODUCTION

One of the key sectors for the development of the economy, of the infrastructure, and of overall quality of life is the construction industry. However, it is also a significant contributor to workplace accidents that cause fatalities and serious injuries. The expense of workers' compensation and lost productivity due to illness are major concerns for this industry. In this industry, poor working conditions and occupational risks are major issues, and in 2020, 81,000 of the workforces reported having recent or ongoing work-related illnesses. The highest percentage in the entire country, 24.20 percent of all occupational fatalities occur in India's construction sector each year.

Although laws exist to address these health and safety concerns, due to a lack of staff, their implementation is challenging. The study shows that the fact that this number has been steadily increasing over time is cause for concern. The frequency and severity of occupational health problems in the construction industry are investigated in this study. The study's findings will help safety managers review their Construction Safety Management System and policies because it focuses on the construction industry. It's crucial to remember that only 1% of workplace fatalities are caused by safety violations; the majority of problems have to do with occupational health.

Organizations prioritize safety above all else, but employers are growing increasingly concerned about occupational illnesses. All safety issues in this industry, including health concerns, should be covered by a well-designed Safety Management System. Safety managers can review their construction safety management system and policies with the help of the study's findings.

In addition to creating and implementing standardized occupational health, safety, and environmental risk identification, assessment, and management systems, a strong culture of construction safety is essential. The science and art of construction safety management must be balanced in order to realize the goal of zero incidents. A conceptual model for promoting a strong construction safety culture is shown in Fig. 1, where the science of managing construction safety is balanced with the art. □□□□□□



Figure 1. Conceptual Model For Promoting A Strong Construction Safety Culture Zou, 2011

OBJECTIVES

The objective of this study was to examine the main causes of accidents and analyze frequency of factors affecting health and safety issues and ranking their severity.

Literature Review

Matthew Yakubu Onuvava (2016) occupational Health and Safety issues in the construction sector are a major global concern. Injuries caused by machines, human factors, and disregard for stakeholder adherence to laws governing the health and safety of workers on the job site are some of the causes of accidents in this industry that are explored in this paper along with potential preventive measures.

According to Dheeraj Benny and D. Jaishree (2017) For the world's economy and society, poor safety management in the construction sector has resulted in losses of money and lives. In developing countries, the effect is more noticeable. The paper has come to a conclusion after making a number of suggestions for construction organizations to enhance workplace safety on construction sites.

According to Evans Ondimu Omweri and DR. Kepha Ombui (2018), the goal of the study was to ascertain the impact of occupational health and safety procedures on the performance of the building construction sector in Nakuru County, Kenya. The study discovered that training, occupational health hazard control measures, workplace inspections, and emergency response planning come in order of importance in influencing the performance of the building construction industry.

Bhavya K and Priyanka M K (2020) said study's objective is to identify and analyses the safety factors that are relevant to nearby construction projects. Throughout the construction project, a typical site-specific safety plan was used to provide direction on safety. The SPSS software method and the RII manual method were used to analyses the data gathered through questionnaire surveys.

This review paper by Umesh Patel, Chintan Raichura, and J. R. Pitroda (2021) discusses how to improve safety in the performance of the building industry. The main goal of the study is to identify the crucial success factors that influence how construction safety management is implemented. Lack of knowledge and awareness contributes to a large number of fatalities and permanent injuries.

METHODOLOGY

This research used both qualitative and quantitative approaches. 127 responses were recorded, with 43 from stakeholders and 84 from workers of construction sites. A stratified random sampling technique was used to choose the participants of questionnaire B, which assessed the prevalence of occupational accidents in building construction sites. 10 construction sites were visited between February and April of 2023, with 8-9 representatives chosen from each site. A lottery system was

used to select the sites for this study from among building construction sites.

Method Of Analysis

Statistics both descriptive and inferential were used to analyze the data. SPSS version 27 was chosen to aid in the analysis of quantitative data. The mean score (MS) was calculated using a five-point Likert scale to rank the impact of factors that contribute to worker accidents and injuries on construction sites.

$$MS = \frac{\sum (f \times S)}{N}$$

Where, MS = Mean score;

f = response frequency for each score;

S = score of each factor (0 to 4); and

N = Total responses for each factor.

Data Analysis And Results

Question A was conducted by civil engineers, while Question B was conducted by construction site workers. Participants were limited to those thought to be at risk for occupational accidents, and those who played a leading or supportive role were excluded. Table - 1 and 2 displays information in demographic manner

Table – 1 Demographic Characteristics Of Stakeholders

Variables	Category	Freq.	%
Type of Company	Client	8	17.4
	Consultant	9	19.6
	Contractor	21	45.7
	Government Authority	5	10.9
Age	18-24	21	45.7
	25-34	12	26.1
	25-44	4	8.7
	45 and above	6	13
Position of Company	Project Manager	7	15.2
	Construction Engineer	6	13
	Site Engineer	11	23.9
	Office Engineer	7	15.2
	Other	12	26.1
Ownership of Company	Private	29	63
	Public	5	10.9
	Both Public and Private	9	19.6

Table – 2 Demographic Characteristics Of Workers

Variables	Category	Freq.	%
Age	18-24	28	15.3
	25-34	40	21.9
	25-44	13	7.1
	45 and above	2	1.1
Level of Education	Illiterate	20	10.9
	Read and write	30	16.4
	Primary School (1-8 Grade)	18	9.8
	Secondary School (9-12 Grade)	9	4.9
	Technical & Vocational	1	5
	Diploma/ Degree	5	2.7
Current Occupation	Daily Laborer	26	14.2
	Plasterer	21	11.5
	Carpenter	8	4.4
	Chiseler	6	3.3
	Mason	9	4.9
	Welder/ Electrician	8	4.4
	Painter	5	2.7
Experience	0 - 1 yrs.	11	6.0
	2 - 5 yrs.	48	26.2
	6 - 10 yrs.	21	11.5
	11 yrs. and above	1	0.5
Employment Condition	Contract	65	35.5
	Permanent	18	9.8

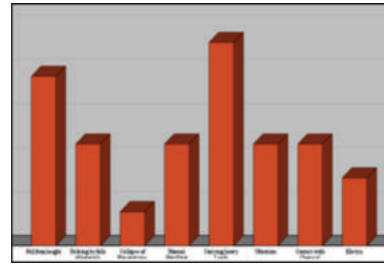


Figure 2: Causes Of Accidents

According to Figure 2, there were several different reasons why accidents happened on the respondents' building construction sites over the course of the previous five years. The most frequent reason for workplace accidents at construction sites is carrying heavy loads. The second leading contributor to mishaps and injuries is falling from a height. The third reason for accidents is striking by objects falling, and so forth.

Factors Contributing To The High Accident Rates On Construction Sites

The reasons for the higher rate of work-related accidents on construction sites were requested from the respondents. Most of them held the opinion that the high accident rates on construction sites were caused by a lack of legislation, a lack of safety knowledge, negligence on the parts of contractors, employees, and consultants, as well as a lack of safety knowledge. The combined effect of these factors results in a high rate of occupational accidents in the construction industry, as shown in Figure 3. Therefore, any intervention to reduce workplace accidents must begin by addressing these issues.

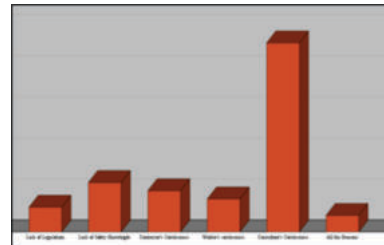


Figure 3: Reason Behind High Rate Of Accidents.

Contractors' Weakness In Safety And Health Management

Survey respondents reported that contractors' shortcomings are a factor in the rising accident rate. The majority of contractors' weaknesses are a lack of training for safety and health, while others include a lack of hiring safety officers, a lack of safety and health policies, a lack of motivation, and a lack of budget for safety and health. The extent of these weaknesses is depicted in Figure 4

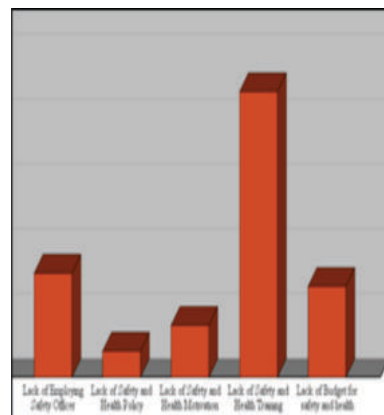


Figure 4: Contractors' Weakness

Worker's Weakness In Safety And Health Management

13 of the respondents (28.3%) thought that the main flaw leading to workplace accidents was a lack of equipment handling experience (Figure 5). The three other flaws in workers that contribute to occupational accidents on construction sites are a lack of training, a lack of a safety culture, and a lack of motivation.

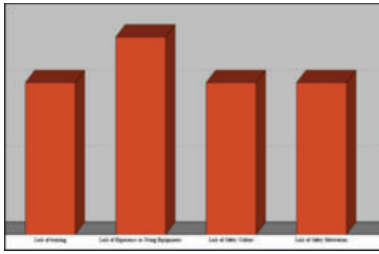


Figure 5: Worker's Weakness

Occupational Illness To Workers

The respondents who had experienced occupational illnesses were asked to indicate the type of their illness in order to rank the most prevalent types of occupational illnesses in building construction sites. As shown in Figure 6 the most common occupational illness in building construction projects is back pain, which is followed by electric shock, broken bones, and skin conditions. Carrying heavy loads is known to cause back pain. The majority of tasks on building construction sites require a lot of manual labour, including moving various construction materials between sites. □□□□□□

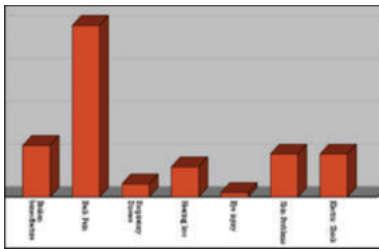


Figure 6: Occupational Illness

Analysis Of Risk Factors Of Occupational Accidents

The 10 risk factors for occupational accidents and injuries on construction sites for buildings were identified and ranked using the mean score method. Personal protective equipment and work practices were the most important contributors to occupational accident occurrence on construction sites, with industry standards, worker training and education, experience, and safe behaviors and attitudes also being included. The top five risk factors for occupational accidents and injuries on construction sites include industry standards, worker training and education, experience, and safe behaviors and attitudes. The ranks given to the 10 risk factors by the respondents are summarized and tabulated in Table 3

Table – 3 Risk Factors For Occupational Accident

Risk Factor	MS Client	MS Cont.	MS Cons.	MS Govt.	WA	Rank
Working surface and platforms	2.0	2.2	3.0	1.8	2.25	1
Worker behavior & attitudes	2.5	2.9	3.2	2.6	2.8	5
Construction structures & facilities	2.5	2.7	3.3	2.6	2.88	7
Managerial level safety intervention	2.3	2.8	2.8	2.2	2.53	2
PPE & methods	2.8	3.2	3.1	2.8	2.98	8
Experience	2.6	3.0	3.1	2.4	2.78	3
Training & education	3.0	2.8	3.5	2.2	2.78	4
Size of construction company	2.6	2.6	3.3	2.8	2.83	6

MS = Mean Score

Cont. = Contractor

Cons. = Consultant

Govt. = Government Authority

WA = Weighted Average

CONCLUSION

The study showed that workplace accidents, illnesses, and diseases were significant issues in building construction projects. The main factors that impacted the issue were a lack of a safety culture among employees, a lack of motivation among contractors to prioritize safety and health, and the government's lack of commitment to politics. The

majority of workplace accidents were caused by falls from heights, material strikes, manual handling, and carrying heavy loads. The poor safety record of the construction sector was a result of the involvement of all parties, including government authorities, clients, and consultants. Accident rates were greater in private businesses than in public ones, demonstrating the profit-driven character of private contractors that disregard people's health and safety.

The majority of the city's construction sites lacked personal protection equipment, welfare services, and safety training for the workers. The data available did not accurately reflect the accident and injury rates in the construction industry. The government's lack of political will to create occupational safety and health rules, standards, and to improve the nation's labor inspection system was a major factor in the issue. Organizational, systemic, and cultural concerns must all be addressed in order to improve occupational safety and health in the construction industry. The consequences of occupational illnesses, injuries, and accidents are enormous and damage the reputation of the construction sector and cause a problem in the nation's socioeconomic system.

RECOMMENDATION

The study found that employees in the study region are exposed to a variety of occupational health and safety risks at construction sites. To address this issue, the government must enact health and safety regulations, create the Department of Occupational Health and Safety Administration, establish a legal framework for mandated insurance programs for workplace accidents, give advice to clients and contractors on the importance of safety and health management, inspect scaffolding and working platforms, keep an eye on how well construction sites are performing in terms of safety, complete safety and health trainings, establish minimum-level welfare amenities on all building sites, verify that each party is carrying out its obligations, modernize and automate the safety and health department's data collection and reporting system, and use mass media to raise awareness of safety and health.

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