

# Safety Management in Construction Industry: A Review

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**Abstract-** The construction industry is one of the largest industries. It is an important part of infrastructure development, which leads to economic growth and the development of an entire nation. Ensuring a healthy environment for labour is important. Protection is a top priority in the construction industry. The main objective of this paper is to do a literature study to find out the factors that are influencing the health and safety environment for labour. The review of literature provides thematic background on safety management from previous related studies. This literature review shows that there are so many factors, like inadequate safety training, being unaware of the equipment used, not implementing the safety regulations and not following safety measures, lack of knowledge of site rules, etc., that are influencing safety management in the construction industry.

**Keywords –** Safety management; Healthy environment; Construction industry; Safety, Causes of accidents; Construction safety; Safety on site.

## I. INTRODUCTION

The construction industry is one of the largest industries. It is an important factor in infrastructure development, which contributes to economic growth and national development. The number of buildings built for commercial, residential, and office purposes has been increasing year after year. Because of its complexity, the construction business is prone to a variety of health risks (Thanaraj & Priya, 2019). The construction sector is extremely dynamic, and it entails numerous risks for workers. Construction workers make up 7 to 8% of the global workforce, with figures as high as 15% to 20% in some countries (Bhatuk & Patel, 2021). It is critical to provide a safe working environment. In the construction industry, safety is a top priority.

Construction workers are mostly unskilled and uneducated, especially in our country (according to the CIDC country report 2005-06, the unskilled workforce constitutes 73.1 percent of the total construction workforce of about 33 million people). Being uneducated, they are unable to understand all the safety management techniques (Jha & Pearson., 2015).

Construction managers should provide a safe and healthy environment to the labour. Safety management procedures can help in recognizing health and safety risks and can reduce the possibility of risk.

The primary concern is executing projects in a timely and cost-effective manner. On construction sites, carelessness is the leading cause of accidents and risks. Because of the changes happening in timings and schedules, as well as the changing nature of construction tasks, the construction industry is prone to accidents (Thanaraj & Priya, 2019).

The process of identifying H&S risks and taking steps to reduce the probability of a risk happening, as well as to reduce or eliminate the potential effects of identified project H&S hazards, is known as safety management. Hazardous injuries and fatalities in the construction industry continue to be a barrier, clinging to the construction industry's infamous position as the industrial sector with the highest number of occupational accidents. As a result,

enhancing construction health and safety remains a primary focus for all stakeholders involved in the process. To mitigate these risks, safety management is likely to consider all hazards and accidents that could reasonably be expected to affect project workers. As a result, establishing suitable safety actions and ways to manage potentially major H & S risks is critical (Saeed, 2017).

The aim of this paper is to study and identify safety management strategies that would help in the creation of a safe and healthy work environment for workers.

## II. LITERATURE REVIEW

(Rukmunnisa Sulthana & Naveen Kumar, 2020) To regulate and minimize construction workers' health and safety, the authors conducted a study to identify and evaluate security management in building projects. It was used to collect a wide range of perspectives from experienced individuals who had worked on a variety of building projects. In that poll, ten percent of respondents worked for customers, fifteen percent for consultants, twenty percent for higher education, fifty percent for contractors, and five percent for the educational and humanitarian (governmental) directorates. The following are the responsibilities that respondents played in their organizations: Site engineers made up 55%, project managers made up 20%, designers made up 10%, principal designers made up 5%, and others, like construction team leaders, made up 10%. 44% of respondents had 5–10 years of experience, 22% had 1–5 years, 20% had 10-15 years of experience, 10% had 15-20 years of experience, and 5% had more than 20 years of experience. When asked how well they understood safety management, 58% said they understood it well, 22% said they understood it very well, 15% said they were familiar with the concept, and only 2% said they didn't grasp it at all. When asked about the organizations that provide health and safety (H&S) care on the job, 83% said they provided H&S care on the job, while 17% said they did not provide H&S care on the job. 44.4% of respondents believed the contractor played a significant role in lowering H & S risk, whereas 29 percent % felt the project manager, 10% thought the principal designer, 7% thought the designer, 5% considered the client, 3% thought the consultant, and the remaining 2% thought someone else. This clearly demonstrates that the project manager and contractor have a critical role in lowering construction-related health and safety risks to workers. The lack of awareness of safety issues among construction parties, such as contractors and project managers, may be the source of H&S issues.

(Golaviya et al., 2018) The authors investigated safety management in the construction industry by gathering data from general contractors who work on several projects. They gathered information on the organization's safety policy, training, meetings, equipment, inspections, safety incentives and penalties, and workers' attitudes toward safety legislation, as well as many other criteria that indicate inadequate safety management. Workers were found to be uneducated, inexperienced, and unaware of the safety precautions and equipment in use.

(Thanaraj & Priya, 2019) The authors sought to identify and evaluate safety management in construction projects in order to reduce and control construction worker health and safety (H&S). They discussed the numerous safety and control procedures for accidents in construction projects, as well as how to use sensor-based technologies to reduce them. They used a survey-based methodology to acquire the data. They discovered that surveying with the use of a questionnaire would be the most efficient method after doing a literature review. They analyzed the collected data statistically using IBM SPSS Statistics software. According to them, the leading causes of worker death are 56% falls from height, 21% trapped by something collapsing or overturning, 10% struck by a moving vehicle, 5% contact with electrical discharge, 4% struck by flying/falling object during machine lifting of materials, 3% contact with moving machinery or material being machined, and 1% exposure to a hot or harmful substance. Sensor-based technology, such as Ultra-wideband (UWB), a wireless positioning approach, has also been discussed. They created a questionnaire with two types of questions and distributed it to developers and promoters, contractors, subcontractors, and consultants from 15 different organizations, largely in Coimbatore. According to the responses they received, the causes of injury are 46.7 percent owing to a lack of safety knowledge, 33.1 percent due to bad working conditions, 15.5 percent due to a lack of personal protective equipment, and 4.7 percent due to other accidents. According to their findings, every construction company should develop a performance-oriented safety program that includes information on personal protective equipment (PPE), safety policies, safety practices, hazardous substances on the job site, power equipment use, worker responsibilities, and so on. Workers should receive proper training, which is an important part of safety management. First aid and medical facilities should be readily available, depending on the scope of the project and the number of laborer's working on the site. The safety policy of management is critical in ensuring a safe working environment. The authors also discussed the Occupational Safety and Health Administration's basic accident prevention guidelines (OSHA). Workers should receive proper training, which is an important part of safety management. First aid and medical facilities should be readily available, depending on the scope of the project and the number of laborer's working on the site. The safety policy of management is critical in

ensuring a safe working environment. The authors also discussed the Occupational Safety and Health Administration's basic accident prevention guidelines (OSHA).

(Prabakar Rajendran & Karthigaipriya, 2019) The authors investigated the most prevalent construction-related fatalities. With the use of a questionnaire survey, they were able to determine the level of adaptation of safety measures in the local construction industry. According to the poll, most construction sites have failed to adapt to safety measures, and fatalities are caused by four different sorts of deadly accidents: falls, being struck by an object, electrocutions, and being caught between two objects. They discovered that falling is one of the most dangerous hazards on the job site, with falling from a height accounting for one-third of all construction-related fatalities. Unsafe acts, unsafe working circumstances, and communication impediments are the most common causes of this sort of mishap.

(Priyanka M K & Bhavya K, 2020) Carried out research to identify the safety factors affecting the local construction projects and to analyze them. They have found that to maintain its effectiveness, the safety management system in the construction project must be improved and monitored on a regular basis. The eight aspects of safety management include safety policy and standards; safety organization; safety training; inspecting hazardous conditions; personal protective programs; plant and equipment; safety promotion; and management behavior. To Small construction companies should be given special treatment by the government in order to establish a systematic construction safety management system, and workers should be provided free Green Book training.

(Rakul P & Ramadhasan, 2020) The authors of this study focused on examining critical components influencing construction project safety and quality management. For data collection, they used a qualitative and quantitative technique. The results of this study show that management commitment, safety knowledge of top management practices/procedures/reviews, and errors in judgement or carelessness are all important safety issues. The most important quality elements influencing safety and quality management were project supervision, staff involvement/attitude, and expertise knowledge/training. They found that PPE plays a vital part in construction industry safety with the help of the study.

(Saeed, 2017) The author conducted research to identify and evaluate safety management practices in construction projects in order to reduce and control construction worker health and safety (H&S). He had created a questionnaire and used it to gather a variety of opinions from experienced professionals working on various building sites in order to compare them.

(Bhatuk & Patel, 2021) Authors have examined the evaluation of various parameters such as accident analysis, accident causes, and types of accidents in a construction working environment. Based on the study of various accidents and various literature, they have found 19 unsafe act, conditions and 22 reasons for the accidents and injuries which affects the projects in India. With the help of the questionnaire through relative important index technique, they have identified the critical factors to deal with their possible solutions by mitigation technique.

### III. DISCUSSION

In this paper, a literature review is carried out on the papers related to safety management from various sources. The review of literature provided thematic background on safety management from previous related studies. With the help of this literature review, it has been found that there are so many factors, like inadequate safety training, being unaware of the equipment used, not implementing the safety regulations and not following safety measures, lack of knowledge of site rules, etc., that are influencing safety management in the construction industry

### IV. CONCLUSION

We can conclude from the above literature review that; workers were found undeveloped and ignorant about security measures and the usage of equipment. They were not aware of the accident. Employers are also inept when it comes to implementing safety measures and adhering to safety regulations. No proper safety supervision is also leading to an unhealthy and unsafe environment for the workers. Employers or contractors were not interested in

investing in safety equipment and were not prioritizing safety management. The most common accident that resulted in major injury to the workers was a fall from a height. Safety management in the construction industry needs to be monitored frequently and further developed. Proper awareness should be given to the workers about the use of equipment. In the construction industry, workers should be trained in safety and safety management. To ensure increased safety, all workers should be provided with personal protective equipment. A safety engineer should be on site to ensure that all safety regulations are followed, and a safety supervisor should be on site to check that workers are following the safety guidelines. Proper safety planning should be done and implemented at the site. While working at elevated places, protected edges, guard rails, and safety nets should be installed. Appropriate scaffolding with good edge protection should be used. Every construction site should have adequate remedies and measures in place to assist in the event of an accident. The government should give small construction companies a break by providing free worker training. It helps to reduce the burden on employers and contractors from the small-scale sector. Governments should also play a vital role in ensuring safety management in the construction industry.

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