

An Investigation into Improving the Safety of Material Handling Equipment in the Construction Sector through Engineering Interventions and Safety Training

Mayank Tiwari¹ and P. S. Tathod²

Shiv Kumar Singh Institute of Technology & Science, Indore^{1,2}

Rajiv Gandhi Proudhyogiki Vishwavidyalaya, Bhopal

Abstract: Construction sites are widely recognized as high-risk environments for workers, often associated with frequent hazardous incidents and a higher rate of fatal accidents. Numerous studies have identified that a significant proportion of these accidents occur during material handling operations. Although many construction sites adopt various safety measures to create a secure working environment and reduce injuries, these efforts often fall short. A key issue is the lack of awareness among equipment operators regarding potential workplace hazards. Many of the incidents stem from inadequate safety protocols, resulting in both minor and major injuries.

To address these challenges, it is essential to integrate several factors into modern construction practices, including advanced equipment, proper resource allocation, and effective overall management. Ensuring safety on construction sites requires the implementation of robust safety frameworks and the involvement of trained professionals with substantial expertise.

This research analyzes safety management practices on construction sites using questionnaire-based surveys, specifically focusing on the safety of material handling equipment. The survey was conducted across small-, medium-, and large-scale construction sites. Based on the findings, two sites were selected for implementing a safety awareness program aimed at enhancing worker safety in material handling operations.

The program was structured into three modules: general worker safety, equipment inspection, and safe material handling practices. Workers' knowledge was assessed both before and after the training, and a t-test analysis was conducted to determine the effectiveness of the safety education program. Based on the results, recommendations are proposed to further improve safety standards on construction sites.

Keywords: Hazard; risk; engineering control; Safety inspections; material handling; construction safety; safety management system; NIOSH; OSHA; PPE: training etc.

