

## A Review Of Occupational Safety and Health in the Construction Sector: Negative Impacts of Workplace Accidents

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### Abstract

The construction sector is an extremely hazardous industry and records the highest number of accidents in most countries worldwide. This sector is found to significantly contribute to a country's economic growth through the role played by its workforce. However, employers still have a low awareness of workplace accidents' negative impacts in this sector. Therefore, this article is prepared to review the impacts of workplace accidents experienced by companies in the construction sector. Through an extensive literature review, it was found that there are five (5) highly significant impacts of workplace accidents, namely: workplace fatalities and injuries, costs, productivity, quality, and company image. This article can serve as a reference for encouraging further research on the importance of occupational safety and health management in the construction sector to prevent workplace accidents and, consequently, avoid the negative impacts that construction companies may experience.

**Keywords:** Workplace Accident, Occupational Safety, Construction Safety, Accident Impact

### Introduction

The construction industry is a dynamic and vital sector that underpins economic development and societal progress. It is a world of innovation, architectural marvels, and the realization of ambitious infrastructure projects. However, occupational safety and health (OSH) issues in this industry have been a significant global concern for a considerable period. Gürçanlı and Müngen (2013) stated that rapid economic development and national growth have made the construction industry one of the most hazardous industries in the world. This is because

construction workers often encounter safety and health risks throughout the construction process due to the hazardous working conditions at construction sites. Construction work involves the extensive use of a wide range of equipment, including advanced machinery and manual tools (Juhari & Arifin, 2020b; Ulang et al., 2014). These activities are typically confined to limited spaces within diverse work environments, leading to a high risk of accidents.

According to data released by the International Labor Organization (ILO), there are more than 2.78 million annual fatalities and roughly 374 million non-fatal work-related injuries and illnesses resulting from occupational accidents and diseases worldwide (ILO, 2021). In Malaysia, based on statistics released by the Department of Occupational Safety and Health (DOSH) Malaysia shows that there were 539 fatality cases in the construction industry from 2018 to 2022 (DOSH, 2023). In detail, the construction industry in Malaysia has contributed to 169 cases in 2018, 144 cases in 2019; 81 cases in 2020; 73 cases in 2021; and 72 cases in 2022 (DOSH, 2023). Even though the trend of the fatality accident statistic was decreasing, the construction industry remains the highest ranking in contributing to occupational fatality cases in Malaysia compared to other industries.

Ensuring occupational safety and health in the workplace, especially in the construction industry, is vital. This is because every accident on the construction site will have a negative impact on the organization as well as other related parties. Thus, this article aims to review the negative impacts of workplace accidents experienced by companies in the construction sector.

### **Impacts of Workplace Accidents**

According to Act 514, the Occupational Safety and Health Act 1994, a workplace accident is defined as an incident that arises from or is related to work and results in fatal or non-fatal injuries. On the other hand, Khanzode et al. (2012) explain that occupational accidents result from the interaction of events within the work system. In summary, occupational accidents are defined as events in the workplace that lead to physical or mental injuries (Eskandari et al., 2017).

Effective and appropriate management of occupational accidents in the construction industry is highly important. This is because construction projects are characterized by large-scale operations, modern technology, complex structures, high technical standards and quality requirements, long durations, and the need for collaboration among various parties (Arifin et al., 2023). These factors underscore the necessity of implementing occupational safety and health management for every construction project to mitigate the risks of workplace accidents.

Arifin et al. (2021) stated that construction project sites are dynamic and constantly changing due to the evolving status of the construction project. They present many hazards and risks during the construction process. Lin et al. (2011) added that if the risks at the construction project site are not effectively managed, it can disrupt the smooth progress of construction goals and, furthermore, lead to more serious negative consequences such as workplace accidents and construction project delays. Work-related accident cases involving the construction industry worldwide have resulted in various negative implications, including loss of lives of workers and the public, financial losses, and disruptions to construction project timelines (Juhari & Arifin, 2020a; Mustard & Yanar, 2023; Zhang et al., 2023).

Reese and Eidson (2006) pointed out that workplace accident incidents can result in the loss of company revenue, illnesses or injuries, equipment or property damage, and near misses. Jabbari and Ghorbani (2016) added that occupational accidents involve significant

expenditures for the community, companies, and the individuals affected. This is also supported by Misiurek and Misiurek (2017), who stated that workplace accidents affect accident victims and involve the broader accident-related environment. After an intensive literature review, this article highlights five negative impacts resulting from workplace accidents in the construction industry that are discussed, namely, workplace fatalities and injuries; costs; productivity; quality; and company image.

### *Workplace fatalities and injuries*

Work-related fatalities and injuries are significant outcomes of accidents involving construction industry workers (Juhari & Arifin, 2020b). These negative impacts are immediate effects, unlike occupational diseases that may take longer to diagnose (chronic effects). According to Chi and Han (2013), workplace accidents occur daily at construction sites. Workplace accidents at construction sites can lead to fatalities and injuries to both workers as well as the public (i.e., cyclists, road users, pedestrians, etc.). According to statistics from the International Labor Organization (ILO), over 2.78 million fatalities and approximately 374 million non-fatal work-related injuries and illnesses occur annually due to occupational accidents and diseases on a global scale (ILO, 2021). A study by Hämäläinen et al. (2006) estimated that there were approximately 350,000 fatal workplace accidents and 264 million non-fatal workplace accidents worldwide in 1998.

According to Sinyai and Choi (2020), in 2017, the construction industry in the United States experienced over 80,000 nonfatal injuries that were significant enough to temporarily remove workers from their jobs. This represents a substantial number of incidents in the industry. Sinyai and Choi (2020) also added that long-term health impairments affect millions of individuals who have been exposed to on-the-job health hazards for years, including but not limited to airborne crystalline silica and excessive noise levels.

In Malaysia, the construction industry is one of the sectors contributing to a high rate of occupational injuries, which was 3.69 per 1,000 workers in 2022 (DOSH 2023). Statistics also indicate that the construction industry in Malaysia recorded the second-highest number of fatal accidents in the workplace compared to other industrial sectors, with a rate of 6.15 per 100,000 workers in 2022 (DOSH 2023). The high incidence of workplace accidents resulting in fatalities and injuries is concerning, and preventive measures must be emphasized. This is because fatalities and injuries resulting from workplace accidents are preventable (ILO 2003).

According to the ILO (2003), there are several categories of injuries caused by accidents in the construction industry, which include serious injuries, permanent disabilities, and minor injuries. In addition, near misses can occur in the construction industry. According to the Occupational Safety and Health (Safety Officer) Regulations 1997 under the Occupational Safety and Health Act 1994, enforced in Malaysia, serious injury is defined as an injury that incapacitates any worker from performing their duties and results in permanent disability. Under the same regulations, permanent disability is defined as an injury that causes temporary incapacity to work. Minor injury, on the other hand, refers to an injury that does not result in any loss of work beyond that required for medical treatment. Near miss, on the other hand, is defined as any workplace accident that can potentially cause injury to any person or damage to any property.

Injuries and fatalities resulting from work activities in the construction sector are highly detrimental negative impacts, particularly for companies, as the workforce consists of trained and professional employees who are valuable assets to the company.

### *Costs*

Cost is one of the crucial factors associated with the negative impact of workplace accidents in the construction industry. According to Hrymak and Pérezgonzález (2007) and Nguyen and Vu (2023), the costs that employers have to bear when workplace accidents occur include employee replacement salary or overtime pay costs, lost production and productivity costs, retraining costs for employees, repair work costs, medical expenses, and personal injury compensation claim costs.

As stated by (Rohani et al., 2015), when workplace accidents resulting in worker fatalities or injuries occur, one of the costs that employers need to bear is the replacement salary or overtime pay for employees. This is because the victims of workplace accidents need to be replaced by other workers to maintain the company's production output (Hrymak & Pérezgonzález, 2007; Misiurek & Misiurek, 2017; Rohani et al., 2015). Furthermore, the company's production and productivity are affected when workplace accidents occur, resulting in losses because the company has to halt operations for accident investigation processes (Rohani et al., 2015). This includes internal accident investigation and occupational safety enforcer agency (external) as well.

Rohani et al. (2015) also added that the cost of retraining employees is an important consideration when a company experiences workplace accidents. This is because the company needs to bring in other workers to fill the positions left by the accident victims, and training is a requirement before these new hires can start their tasks (Rohani et al., 2015; Sun et al., 2006). Repair work costs involve damage to property caused by workplace accidents (Hrymak & Pérezgonzález, 2007; Misiurek & Misiurek, 2017). For example, this may include repairing damaged machinery and company facilities that require significant expenses due to accidents (Rohani et al., 2015).

Medical expenses are also considered when workplace accidents involving injuries requiring medical treatment occur (Hrymak & Pérezgonzález, 2007; Misiurek & Misiurek, 2017). Medical expenses vary depending on the severity of the injuries suffered by the accident victims. On the other hand, personal injury compensation claims costs involve expenses related to personal injury insurance claims. Nguyen and Vu (2023) and Nai'em et al. (2020) explain that the costs of compensating injured workers that employers have to bear may increase because insurance companies charge higher premiums to companies with poor OSH performance. In addition, a study conducted in Indonesia on a construction project of Hasanuddin University Faculty of Engineering by Nai'em et al. (2020) found that the cost of work accident handling is around IDR 64,534 million (USD 10.5 million). Moreover, ILO revealed that the economic cost of occupational deaths, injuries, and illnesses is estimated at 3.94 percent of the global Gross Domestic Product each year.

### *Productivity*

Productivity is also one of the important factors associated with the impact of workplace accidents in the construction industry. Deaths and injuries resulting from workplace accidents have proven to have a detrimental effect on the productivity of construction companies and the national economy (Fernández-Muñiz et al., 2015; Génesis et al., 2022; Hrymak & Pérezgonzález, 2007). Rajaprasad and Chalapathi (2015) through their study found that a strong OSH performance contributes to better organizational productivity.

Besides that, machinery and equipment damaged due to workplace accidents will decrease the company's productivity (Juhari & Arifin, 2020b). This is because activities that rely on the damaged machinery and equipment cannot proceed until repairs are completed

(Hrymak & Pérezgonzález, 2007; Misiurek & Misiurek, 2017; Nguyen & Vu, 2023; Rohani et al., 2015).

On top of that, the loss of skilled and experienced workers due to fatal accidents or permanent disabilities will also reduce the company's productivity. According to Senouci et al. (2015), workplace accidents involving injuries and fatalities in the construction industry impact construction project delays because the company has lost skilled, experienced, and efficient workers in carrying out their tasks. Mahmoudi et al. (2014); Ortiz-Barrios et al. (2022); and Rzepecki (2012) state that the implementation of strong OSH management can reduce workplace accident rates and, in turn, improve work efficiency trends, indirectly enhancing productivity and benefiting the organization.

Company productivity can also decline due to employee absenteeism from accidents, where accident victims must take sick leave for medical treatment (Hrymak & Pérezgonzález, 2007). As specified by Misiurek & Misiurek (2017), employee absenteeism is one of the causes that results in employers incurring losses that will impact a decrease in company productivity. Moreover, Aaltonen et al. (2006) found that a reduction in workplace accidents and occupational illnesses can contribute to a decrease in employee sick leave, making the organization more productive by utilizing a complete workforce.

The replacement of new employees will also adversely affect the company's productivity. This is because the company has lost skilled and experienced workers who efficiently perform their tasks. Therefore, the company needs to invest more in the cost of hiring new employees, in addition to providing appropriate training to make these employees skilled and efficient like the experienced ones (Hrymak & Pérezgonzález, 2007; Misiurek & Misiurek, 2017; Rohani et al., 2015).

Furthermore, the suspension of construction activities to conduct accident investigation procedures by the company and the authorities will lower the company's productivity. Senouci et al. (2015) explains that workplace accidents in the construction industry involving injuries and fatalities impact construction project delays because the company needs to carry out accident investigation procedures, reducing productivity. Rohani et al. (2015) also state that accident investigation procedures by both internal (company) and external (government enforcement) parties will affect the company's productivity because employees need to focus on investigation activities rather than their regular daily work. Hence, it can be affirmed that workplace accidents in the construction sector can reduce worker's productivity.

### *Quality*

Quality is also one of the critical factors associated with the impact of workplace accidents in the construction industry. Aaltonen et al. (2006); Mustard and Yanar (2023); and Rzepecki (2012) highlighted that safe and healthy workers are more productive and can produce work of the highest quality. One of the quality-related factors in a construction site is project delays according to the established schedule (Cagno et al., 2013). Cagno et al. (2013) explain that accident management at the construction site is a cause of project delays. When project delays occur, workers may produce lower-quality products due to time constraints (Hrymak & Pérezgonzález, 2007).

The loss of skilled and experienced workers due to fatal accidents or permanent disabilities is also believed to reduce work quality (Senouci et al., 2015). Senouci et al. (2015) also adds that the replacement of skilled and experienced workers with new employees can contribute to less satisfactory work quality. Similar to its impact on productivity, the company

needs to hire new employees and provide appropriate training to make them skilled and efficient like experienced workers. New employees typically require time and sufficient training to become competent and produce quality work (Hrymak & Pérezgonzález, 2007; Misiurek & Misiurek, 2017; Rohani et al., 2015).

Workers who have experienced injuries due to workplace accidents will also reduce their work quality. According to a study by Behm (2009), victims of workplace accidents generally have low morale, which has been linked to productivity and the quality of tasks performed. Therefore, it can be emphasized that workplace accidents in the construction sector can reduce the quality of worker's jobs.

### *Company image*

Company image is also a crucial factor that every organization in the construction industry needs to emphasize. This is because, according to Mustard and Yanar (2023) and Rajaprasad and Chalapathi (2015), improving the organization's image is a qualitative benefit that can be achieved through strong work quality. Rzepecki (2012) and Zhang et al. (2023) also agree that companies with robust OSH performance show an improvement in their organizational image. Furthermore, according to a study conducted by the ILO (2003), most companies nowadays take social and environmental performance seriously, with OSH elements considered in their economic measurements in achieving multiple profits. This is because it represents a good reputation for a company regarding social responsibility and indirectly enhances its image. In summary, a company's image can be tarnished when workplace accidents occur on its premises, especially when they involve fatalities.

One of the factors that can negatively impact a company's image is when accidents within the organization are reported in printed or electronic media (Hrymak & Pérezgonzález, 2007; Misiurek & Misiurek, 2017). This is because information about accidents that spreads and becomes known to the general public will subsequently have a negative impact on the organization. As a result, the public may become less trustful of the organization, especially when it involves the employer's responsibility for the safety and health of their workers (Cagno et al., 2013).

Moreover, workplace accident cases that result in legal actions taken by authorities will also effect the company's image (Cagno et al., 2013; Mahmoudi et al., 2014b; Rajaprasad & Chalapathi, 2015; Zahoor et al., 2015). For example, all companies that face punitive actions, such as legal cases by DOSH Malaysia, will be publicized on the enforcement agency's website. Compensation claims made by workplace accident victims will also indirectly tarnish the company's image.

Workplace accidents will also impact a company's collaboration with partners and stakeholders (Cagno et al., 2013; Mahmoudi et al., 2014b; Rajaprasad & Chalapathi, 2015; Zahoor et al., 2015). Cagno et al. (2013); and Mustard and Yanar (2023) explain that a poor organizational reputation will have a more severe effect than quantitative impacts, as it involves the brand and name of the organization.

### **Conclusion**

In conclusion, this article has provided a comprehensive review of occupational safety and health in the construction sector, specifically focusing on the negative impacts of workplace accidents. Five critical areas of concern were explored, shedding light on the far-reaching

consequences of these accidents: (1) Workplace accidents in the construction industry pose a severe threat to the lives and well-being of workers and other persons; (2) Workplace accidents incur substantial financial burdens for construction companies. The discussion revealed that the costs associated with medical expenses, workers' compensation, and potential legal liabilities could significantly impact a company's bottom line; (3) The direct correlation between workplace accidents and reduced productivity in the construction sector. Injuries and accidents result in downtime, increased absenteeism, and the need to train replacement workers, ultimately hampering project progress and timelines; (4) Workplace accidents also indirectly affect the quality of work in construction projects. The disruption caused by accidents may lead to rushed or suboptimal work, potentially compromising the overall quality and safety of the final product; (5) Beyond immediate financial repercussions, workplace accidents tarnish a construction company's reputation and image. This article underscored that negative publicity and legal actions associated with accidents can erode trust with clients, investors, and partners, further impacting the organization's long-term viability.

In summary, this review article bridges the gap between academic discourse and practical application by offering a holistic understanding of the repercussions of workplace accidents in the construction sector. In light of these findings, it is evident that addressing workplace safety and health in the construction sector is not merely a legal or ethical obligation; it is a fundamental business imperative. Mitigating the negative impacts of workplace accidents through proactive safety measures, training, and a robust safety culture can lead to a safer, more efficient, and reputable construction industry. This review underscores the urgent need for continued efforts to improve safety practices and promote a culture of well-being in the construction workplace.

### **Conflict of Interest**

None to report

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