

Effects of Inadequate Compliance with Health and Safety Regulations in the Nigeria Construction Industry

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Abstract

The construction industry is inherently hazardous, and inadequate compliance with health and safety regulations exacerbates risks to workers, projects, and organizational outcomes. This study investigates the levels of awareness, compliance, and attitudes toward health and safety regulations in the Nigerian construction industry, alongside the consequences of non-compliance. Data collected from 152 respondents indicate moderate awareness of health and safety protocols, with notable disparities between professionals and labourers. Regular safety training was reported by only [22%] of participants, revealing systemic shortcomings in workforce preparedness. Compliance with safety regulations was found to be inconsistent, with limited enforcement by supervisors and insufficient prioritization by management. The study identifies injuries, project delays, and financial losses as the most significant consequences of non-compliance. Statistical analysis using Spearman's correlation reveals a weak but significant negative relationship ($r = -0.18$, $p = 0.027$) between adherence to safety regulations and the frequency of workplace accidents, underscoring the pivotal role of compliance in mitigating hazards. These findings emphasize the urgent need for strategic interventions, including mandatory safety training programs, rigorous enforcement mechanisms, and a culture of accountability to improve safety outcomes.

Keywords: Health and safety regulations, compliance, construction injury, workers attitude

Introduction

In most countries, the construction industry plays an essential role in their socioeconomic development. It typically contributes around [11%] of the Gross Domestic Product (GDP) in many developing countries (Giang & Pheng, 2011) and provides employment for up to [10%] of the labourforce, while also contributing significantly to a nation's gross fixed capital formation (Ismail, Doostdar & Harun, 2012). These figures illustrate the substantial economic engagement and impact of the construction industry within any economy.

Despite its importance, the construction industry is consistently ranked as one of the most hazardous industries worldwide (Suazo & Jaselskis, 1993). The World Health Organization (WHO, 2010) notes that the construction industry experiences one of the highest fatality rates globally, emphasizing its reputation as a high-risk sector (Smallwood & Haupt,

2008). A prominent factor contributing to these accidents is inadequate compliance with health and safety regulations (Ahmed, 2019). Studies indicate that accident rates in the construction industries of developing nations are significantly higher than those in developed countries, such as the United Kingdom, United States, China, and Australia, primarily due to less rigorous enforcement of safety regulations (Idoro, 2007). Kineber et al. (2023) further assert that developed countries benefit from robust regulatory frameworks that actively enforce health and safety practices, thereby reducing accident rates on construction sites.

Nigeria is one of the developing nations facing serious challenges regarding construction site safety due to widespread non-compliance with established health and safety standards. These safety incidents result in substantial social and economic losses. Beyond the tragic loss of life, they impact productivity, disrupt work schedules, and lead to considerable financial costs. Accidents often cause significant work delays, disrupt the construction workforce, and can lead to a reduction in both skilled and unskilled labour, further impeding the growth of the industry ((Udo, Usip, & Asuquo, 2016); (Enshassi, Choudhry, Mayer, & Shoman, 2008)). A critical factor exacerbating this situation in Nigeria is the lack of formal training and low literacy rates among construction workers, with approximately [90%] of construction site employees coming from rural backgrounds with limited education (Okorie & Aigbavboa, 2016).

To mitigate these issues, it is critical to strengthen compliance with health and safety regulations across the industry. Fang, Huang, and Hinze (2004) emphasize that health and safety protocols are instrumental in reducing workplace hazards and improving safety performance on construction sites. This study, therefore, aims to examine how stakeholders in the Nigerian construction industry engage with health and safety regulations by assessing the level of health and safety awareness among stakeholders, investigating the degree of compliance, evaluating construction site workers' attitudes towards health and safety rules and regulations, and analyzing the effects of inadequate compliance with health and safety regulations on project delivery.

Literature Review

The Nigerian Situation

Nigeria's safety standards have not matched the growth of urbanization and infrastructure development in recent years. According to the Nigerian Institute of Building (NIOB), there were over 152 documented building collapses in Nigeria from 2005 to 2022, with Lagos State accounting for [61%] of these incidents (NIOB, 2022). These incidents often result in multiple fatalities and severe injuries, placing Nigeria among the countries with the highest rates of construction-related accidents in sub-Saharan Africa.

Reports from the World Health Organization (WHO) highlight that in Nigeria, construction workers face a significantly higher risk of occupational injury compared to other sectors. WHO estimates suggest an average of four construction-related fatalities daily,

underscoring the acute risks faced by workers in the industry (WHO, 2010). This figure is further illustrated by notable incidents in recent years, such as the collapse of the 21-story building in Ikoyi, Lagos, on November 1, 2021. This single event claimed approximately 50 lives, including the building's developer, drawing public attention to the pervasive non-compliance with safety standards in the sector (Adelagun, 2021). Another major incident involved the collapse of a five-story building in Lekki in 2016, resulting in over 30 fatalities (Omojoye, 2016). These incidents are not isolated but are part of a recurring pattern attributed to weak regulatory standards and a disregard for safety protocols among some construction firms. Data from the Lagos State Emergency Management Agency (LASEMA) reveal that Lagos alone recorded 30 building collapses between January and July 2022, underscoring the frequency and severity of these safety lapses (Akoni, 2022).

Despite some existing safety regulations, inadequate adherence to these standards has led to frequent and devastating incidents. This ongoing situation reflects an urgent need for comprehensive and immediate improvements in the implementation of health and safety measures.

Health and Safety Regulations

Countries with well-established health and safety standards in the construction sector often benefit from stringent regulatory frameworks, advanced training programmes, and robust enforcement mechanisms that contribute to low accident rates. These nations typically adhere to comprehensive Occupational Health and Safety (OHS) guidelines, such as those provided by the International Labour Organisation (ILO) and ISO standards, fostering a safety culture across all levels of the construction process. For instance, the United Kingdom has a long-standing commitment to construction safety, supported by legislative frameworks such as the Health and Safety at Work Act (1974) and the Construction (Design and Management) Regulations (CDM) of 2015 (Health and Safety Executive [HSE], 2015). These regulations prioritise risk assessments, safe working practices, and accountability among project stakeholders. The effectiveness of this approach is reflected in the UK's low construction accident rates. According to the HSE, fatalities in the construction sector have significantly decreased over the past two decades, demonstrating how stringent legislation and consistent enforcement contribute to safer working environments (HSE, 2022). Similarly, in the United States, the Occupational Safety and Health Administration (OSHA) operates under the Occupational Safety and Health Act of 1970, establishing comprehensive regulations for the construction industry. OSHA focuses on equipment safety, protective gear, and training, resulting in reduced workplace injuries and fatalities (OSHA, 2022). The U.S. has also leveraged technological advancements, such as wearable devices for monitoring workers' health metrics and real-time location tracking, to enhance onsite safety.

In contrast, developing nations like Nigeria face numerous barriers to achieving similar levels of OHS compliance. Idoro (2011) observes that cost-cutting pressures often lead construction companies to neglect basic safety standards. Moreover, Nigeria's OHS

regulations are frequently outdated and suffer from inadequate enforcement. Diugwu et al. (2012) highlight that while Nigeria has an OHS regulatory framework, its implementation remains weak due to insufficient oversight agencies and limited resources. Political instability and corruption further undermine enforcement efforts, as some companies bypass safety checks through bribery or political connections (Umeokafor et al., 2014). Another significant challenge is workforce literacy. The predominance of unskilled and semi-skilled labour in Nigeria's construction industry hampers the effectiveness of safety training programmes, as many workers lack the literacy required to understand and adhere to safety protocols (Okorie et al., 2016). This challenge is compounded by the absence of formal safety training programmes, which are often deprioritised in the construction industry. Nigeria's OHS challenges are not unique and are mirrored in other developing economies. For example, India's construction sector is plagued by insufficient regulation, weak enforcement, and a reliance on informal labour markets, leading to compromised safety practices (Nag & Patel, 2020). Similarly, despite having OHS regulations, South Africa continues to experience high incident rates due to weak enforcement and budgetary limitations (Smallwood & Haupt, 2008).

Regulatory Frameworks in Nigeria

The regulatory environment for health and safety in Nigeria's construction industry is shaped by a variety of policies, standards, and laws designed to mitigate risks and promote safe working conditions. One of the primary legislative frameworks governing occupational health and safety (OHS) in Nigeria is the Factories Act of 1987, which mandates basic safety requirements across various industries, including construction. This act outlines the need for proper supervision, adequate training, and the provision of safe equipment and workspaces (Idubor & Osiamoje, 2013). However, despite serving as a structural foundation, the Factories Act has faced criticism for being outdated and insufficient in addressing the complexities of modern construction projects, especially large-scale projects in urban settings. In addition to national laws, Nigeria is a signatory to several international labour conventions, such as those set by the International Labour Organization (ILO), which advocate for universal standards in workplace safety (ILO, 2021). While these international conventions provide useful guidance, their effectiveness hinges on robust local enforcement which is a major challenge in Nigeria.

Enforcement of health and safety regulations in Nigeria remains inconsistent due to several systemic barriers. A key issue is the shortage of trained personnel and regulatory inspectors. Diugwu et al. (2012) report that Nigeria's enforcement agencies are often understaffed and under-resourced, leading to limited site inspections and insufficient oversight. Additionally, corruption within regulatory bodies has been documented as a significant obstacle, undermining both the credibility and efficacy of enforcement mechanisms. Some construction companies reportedly circumvent safety protocols by bribing inspectors, enabling non-compliance to persist with little or no consequence. Although the

Nigerian government has implemented the Occupational Health and Safety Policy to address these issues, studies indicate that there is often minimal alignment between policy intentions and actual practices on construction sites (Okojie, 2010). Without stronger political will and effective accountability mechanisms, enforcement remains weak, contributing to the high rates of construction-related accidents and fatalities (Idoro, 2011). Another significant challenge to the enforcement of health and safety regulations is cultural attitudes within the construction industry.

In Nigerian society, particularly in rural areas where many construction workers originate, productivity is often prioritized over safety. Safety protocols are sometimes perceived as unnecessary obstacles to efficient work, rather than as essential practices to protect workers (Okorie & Aigbavboa, 2016). This mindset influences the attitudes of workers and contractors on construction sites, where adherence to health and safety measures is frequently secondary to the urgency of completing tasks. Additionally, low literacy levels among Nigeria's construction workforce pose another barrier to compliance. This lack of awareness significantly contributes to the high rate of accidents, as workers may not fully understand the importance of compliance or fail to recognize hazardous conditions that need to be mitigated. Research by Akinwale & Olasunkanmi (2018) indicates that workers with higher literacy levels are more likely to adhere to safety protocols, as they better understand the risks and long-term consequences of unsafe practices. Cultural expectations within local communities also influence workers' attitudes toward safety.

In many Nigerian communities, construction work is often seen as a means to quickly earn an income, which leads to workers prioritizing speed over safety to complete projects faster and maximize earnings. This cultural predisposition toward expediency rather than caution not only endangers workers but also complicates the enforcement of safety standards. Addressing these challenges requires a cultural shift that emphasizes the long-term benefits of risk management and prioritizes safety as a core value in the industry.

Effects of Inadequate Compliance on Project Delivery

Empirical studies consistently demonstrate a clear relationship between health and safety compliance and accident rates within the construction industry. In developed nations, strict adherence to safety protocols correlates with significantly lower accident rates. For instance, a study by Hallowell and Gambatese (2009) in the United States found that construction projects with rigorous safety standards experienced up to [50%] fewer incidents compared to those with limited compliance measures. This highlights the tangible safety benefits of following established health and safety protocols. In contrast, research focused on Nigerian construction sites underscores the negative consequences of low compliance levels.

Hamma-adama, Waziri, & Kadai, (2015) reported that accident rates in Nigerian construction projects are among the highest in the world, primarily due to weak regulatory enforcement and poor adherence to safety protocols. A high percentage of reported accidents on Nigerian construction sites were directly linked to non-compliance with basic safety

procedures, highlighting the severe consequences of inadequate compliance. In many cases, minor injuries escalate into major incidents because workers are often unaware of or disregard preventive measures (Idoro, 2011).

Moreover, non-compliance with safety standards has substantial economic consequences. Several studies have quantified the financial impacts, showing that accidents due to poor compliance increase both direct costs and indirect costs. Diugwu et al. (2012) found that interventions aimed at improving compliance could potentially reduce accident-related costs by [20-30%] for Nigerian construction firms. This suggests that even modest improvements in compliance could lead to significant reductions in accident rates and associated costs, enhancing both safety and financial outcomes. Beyond the immediate risks of accidents, non-compliance has broader repercussions for project timelines, budgets, and workforce productivity. Research on international construction projects indicates that safety-related disruptions are a leading cause of delays. Hinze (2006) found that safety violations accounted for over [15%] of all reported project delays in large-scale construction projects in the United Kingdom. Such delays are often compounded by the time required for regulatory investigations and site repairs. In Nigeria, the financial impact of non-compliance is similarly significant. Idoro (2011) analyzed 30 Nigerian construction projects and found that projects with frequent non-compliance incidents experienced delays of up to [20%] beyond the scheduled completion time. These delays contribute not only to increased operational costs but also damage client relationships, potentially affecting future contract opportunities. Contractors often face additional expenses, such as penalty fees and labour costs, which may significantly erode profit margins (Tang, 2004). Also, non-compliance can lead to workforce reductions due to injuries and illnesses, further delaying projects and reducing labour productivity. In terms of project costs, Mashwama, Aigbavboa, and Thwala (2017) noted that projects, where compliance was routinely neglected, saw an average increase of over [10%] in overall costs due to rework, medical expenses, and safety-related penalties. Thus, non-compliance creates a cascading effect of financial burdens, time delays, and productivity losses, undermining both the viability of projects and the long-term sustainability of construction firms.

Methodology

This research, which primarily seeks to assess the effects of inadequate compliance with health and safety regulations in the Nigerian construction industry, utilized a quantitative approach, employing a descriptive survey design. A thorough review of relevant literature identified key safety challenges within Nigeria's construction sector, which informed the development of a structured questionnaire. This questionnaire aimed to capture insights from construction site workers and professionals, particularly architects, engineers, safety officers, and quantity surveyors on safety compliance issues.

Given Lagos's status as Nigeria's hub for infrastructure development, this city was selected as the primary location for data collection, offering a representative sample of

construction practices in the country. Using purposive sampling techniques, a total of 189 questionnaires were distributed via digital platforms and in person. Out of the 167 retrieved responses, 152 were deemed valid and subsequently used for analysis.

Data analysis involved descriptive and inferential statistics to examine attitudes toward health and safety, awareness levels, compliance rates, and the specific impacts of inadequate compliance. Statistical analyses were conducted using SPSS, Python, and Excel to ensure precision and efficiency. Results are presented in tables and graphs to facilitate clear visualization of findings.

Data Analysis and Discussion of Findings

Awareness of Occupational Health and Safety

Out of the 152 valid respondents, [82%] reported a satisfactory level of awareness of health and safety regulations (Figure 1), while nearly [20%] demonstrated low awareness, highlighting significant knowledge gaps among certain segments of the workforce. This disparity is particularly concerning, as awareness forms the foundation of a safe working environment. Despite this, only [22%] of respondents reported receiving regular safety training from their organizations. This lack of consistent training directly impacts workers' familiarity with specific safety procedures, with just [45%] of respondents rating their familiarity as high. These findings point to systemic shortcomings in the communication and reinforcement of safety practices within the industry. Professionals demonstrated higher levels of awareness compared to site workers (Figure 2), who are most exposed to on-site risks. This disparity underscores the urgent need for targeted training programs specifically designed for front-line workers. The findings align with previous research emphasizing that effective communication and training are critical to achieving compliance at all organizational levels.

The low training rates and uneven awareness among workers suggest that many organizations may prioritize health and safety compliance for managerial roles, leaving on-ground operatives underprepared. This oversight increases the likelihood of unsafe practices, potentially leading to workplace accidents, project delays, and financial losses. To address these gaps, organizations should implement mandatory, recurring safety training programs for all employees, regardless of role, and conduct routine safety audits to monitor and improve compliance. Such interventions are essential for bridging the knowledge gap, fostering a culture of safety, and reducing risks across the workforce.

Figure 1: Level of Health and Safety Awareness

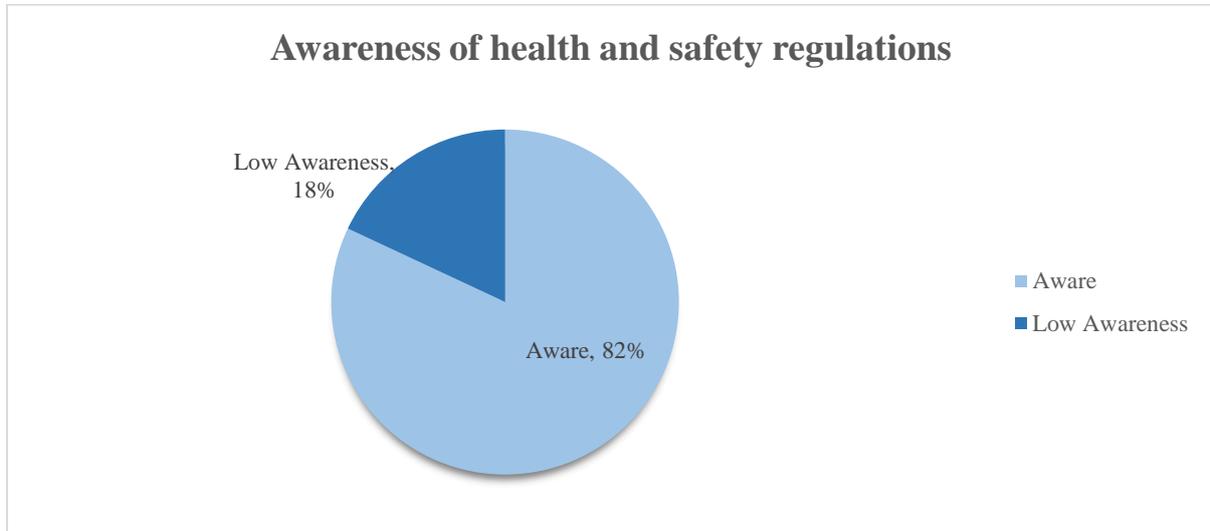
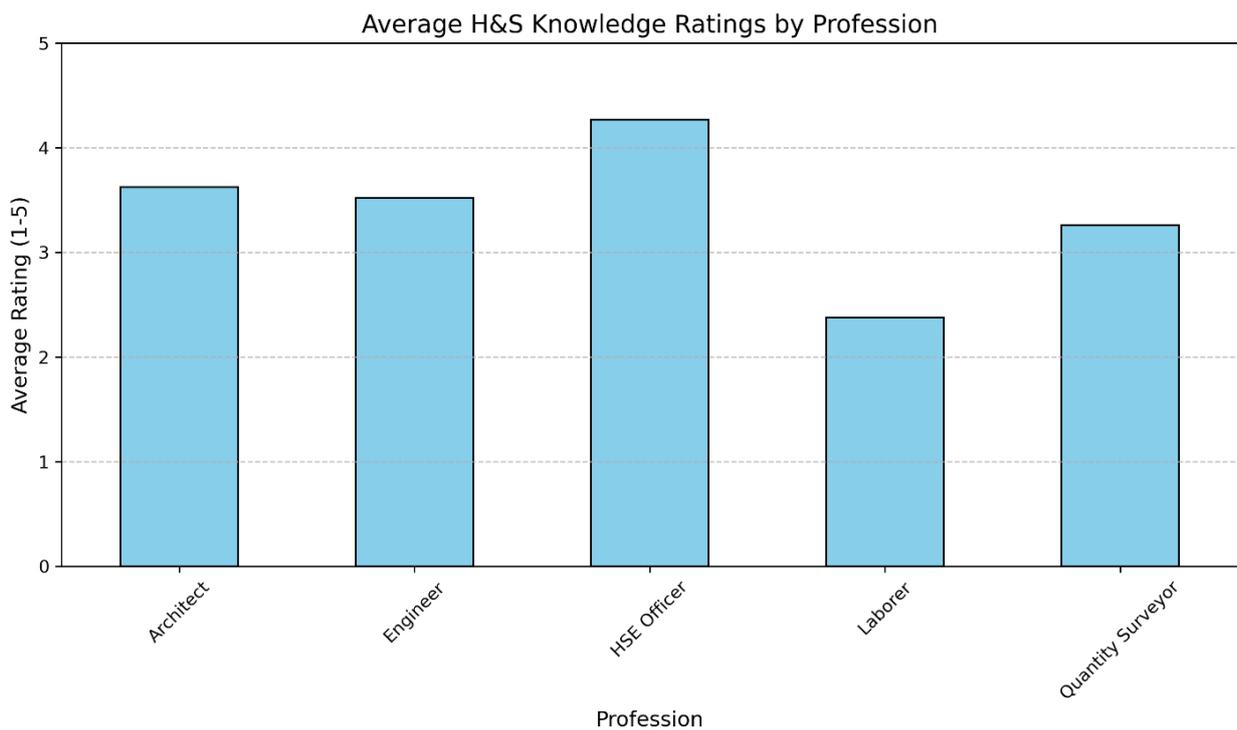


Figure 2: Health and Safety Knowledge Ratings by Job Role



Degree of Compliance with Health and Safety Regulations

Table 1. Compliance with safety regulations

Variables	Valid	Mean	SD	Rank
Documentation of safety guidelines	152	2.70	1.249	1
Accessibility of PPE	152	2.66	1.163	2
Adherence to safety regulations	152	2.51	1.016	3
Site safety inspection	152	2.45	0.890	4
Consistency of safety enforcement	152	2.42	1.020	5
Strictness of supervisors	152	2.36	0.993	6
Management attention to safety	152	2.26	0.966	7
Average mean score		2.48		

Table 1 provides an overview of compliance with health and safety regulations based on several key variables. The results indicate moderate levels of adherence, with an average mean score of 2.48, suggesting room for improvement across the industry. The documentation of safety guidelines ranked the highest among safety practices, with a mean score of 2.70, reflecting some effort in recording safety protocols. However, the adequacy and accessibility of these documents remain unclear, raising concerns about their practical usability. The accessibility of personal protective equipment (PPE) received a slightly above-average rating (mean: 2.66), suggesting moderate availability but pointing to potential barriers preventing full accessibility. Adherence to safety regulations scored a mean of 2.51, indicating only moderate compliance, which could stem from inadequate training and insufficient enforcement measures.

Site safety inspections were reported as infrequent, with a mean score of 2.45, falling below average. This underscores a significant gap in identifying hazards and ensuring compliance through regular oversight. Consistency in safety enforcement and supervisory strictness were rated even lower, with mean scores of 2.42 and 2.36, respectively. These scores highlight inconsistencies in enforcement across sites and a generally lax attitude from supervisors toward maintaining strict safety standards. Lastly, management attention to safety ranked the lowest, with a mean score of 2.26, revealing that health and safety compliance is not prioritized at the management level, further exacerbating the challenges in fostering a robust safety culture.

Attitude Toward Health and Safety

The analysis revealed that approximately [72%] of respondents demonstrated a positive attitude toward health and safety, indicating a general willingness to follow safety guidelines when they are provided and enforced. This suggests that a majority of workers recognize the importance of safety and are inclined to adhere to regulations when they are adequately supported.

However, the findings also point to a significant concern. Despite the positive attitude of many workers, (56%) of respondents indicated they would not comply with safety guidelines when not directly supervised. This underscores a critical issue. Workers' adherence to safety protocols is often contingent on supervision, and without consistent enforcement, even those who understand the importance of safety are likely to overlook guidelines. This disparity between positive attitudes and actual compliance highlights the need for a stronger, more proactive approach from management. As previously noted, management does not prioritize safety as strongly as it should, and supervisors' lack of strict enforcement further exacerbates this issue. The industry must cultivate a culture where safety is not merely a guideline but a shared responsibility across all levels of the workforce. Management should prioritize safety as a core aspect of the organizational culture. This could involve regular safety audits, better communication of safety expectations, and a demonstration of commitment through resource allocation and leadership involvement.

Effects of inadequate compliance with health and safety regulations

Table 2: Effects of Inadequate Compliance

Effects	Valid	Mean	SD	Rank
Injuries and death	152	4.23	0.993	1
Delay	152	4.14	0.900	2
Cost effects	152	3.89	1.145	3
Productivity	152	3.54	1.006	4
Damages to plant and equipment	152	3.50	0.966	5
Reputation	152	3.47	0.949	6
Disruption of site operation	152	3.45	0.818	7
Material wastage	152	3.38	0.963	8
Worker's morale	152	3.10	1.132	9
Long term effects	152	2.72	0.749	10
Legal liabilities	152	2.68	1.119	11
Average mean score		3.46		

Inadequate compliance with health and safety regulations has far-reaching consequences in the construction industry, as revealed by both the literature review and survey findings. Table 2 presents the key effects identified, ranked by their Mean Scores (MS). With the highest mean score (4.23), injuries and deaths were identified as the most critical consequence of inadequate compliance, highlighting the direct human impact of unsafe practices. Delays (4.14) and cost effects (3.89) highlight the operational and economic burdens resulting from non-compliance. A notable impact on productivity (3.54) indicates that unsafe conditions disrupt workflow and reduce overall efficiency. These findings show the interconnected nature of these effects, where one issue, such as injuries, often cascades into others, amplifying the overall impact.

Relationship Between Inadequate Safety Compliance and Injuries

To further understand the relationship between inadequate compliance and its most significant consequence, worker injuries, a Spearman correlation analysis was conducted. The result is summarized in Table 3.

Table 3: Correlation between compliance and worker injuries

Correlation coefficient	Nature of association	P-value	Decision
-0.18	Weak negative correlation	0.027	Reject H_0

The correlation coefficient of -0.18 indicates a weak negative relationship between compliance and injuries. This suggests that as adherence to safety regulations increases, the frequency of workplace injuries tends to decrease slightly. The P-value of 0.027, which is statistically significant at the 0.05 level, confirms the substantial association between compliance and injury occurrence. While the correlation is weak, it is still statistically meaningful, emphasizing the importance of adhering to safety regulations to reduce on-site injuries. These findings validate the hypothesis that inadequate compliance is a key risk factor in construction safety. Although the correlation is weak, it highlights the need for consistent enforcement of safety regulations to prevent accidents and associated effects. Organizations should therefore invest in training and ensure frequent monitoring to reduce safety risks. Also, regular site audits and risk assessments can help identify and address potential hazards before they result in injuries. Further studies should explore additional factors influencing the relationship between compliance and injuries to uncover deeper insights.

Conclusion

This study has examined the critical issue of health and safety compliance in the construction industry, focusing on awareness levels, attitudes, compliance rates, and the consequences of inadequate adherence to safety regulations. The findings reveal significant gaps and challenges that need urgent attention to improve the safety culture within the industry. The analysis indicates that while most respondents demonstrate a satisfactory level of awareness of health and safety regulations, this awareness is not consistently translated into practice. A lack of regular safety training, weak enforcement by management, and limited access to personal protective equipment (PPE) are significant barriers to achieving full compliance. Additionally, a disparity in awareness levels between professionals and site workers highlights the need for targeted interventions to address knowledge gaps. The study also emphasizes the consequences of inadequate compliance, with injuries, delays, and cost overruns ranking as the most critical effects. The weak but statistically significant negative correlation between safety compliance and injury rates underscores the importance of adherence to safety protocols in minimizing workplace accidents and fostering a productive, sustainable work environment. To address these issues, organizations must prioritize safety as a core aspect of project management. This involves regular training programs and stringent enforcement of safety regulations, consistent safety audits, and fostering a culture of personal

responsibility among workers. Management must lead by example, demonstrating a commitment to safety that extends beyond compliance for regulatory purposes to genuine concern for the well-being of all workers.

In conclusion, the findings of this study reinforce the need for a proactive approach to health and safety in the construction industry. By bridging gaps in awareness, compliance, and enforcement, stakeholders can reduce risks, enhance productivity, and ensure safer construction practices. Further research can be carried out to explore the ways of bridging these gaps.

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