

Research Paper

Open Access

Michael Adesi*, De-Graft Owusu-Manu, Frank Boateng, Moses Ahiabu

Employee perspective on site accidents and corporate reputation in developing countries

DOI 10.2478/otmcj-2023-0006

Received: December 19, 2022; accepted: June 04, 2023

Keywords: construction, corporate, reputation, site, accidents**Abstract:**

Brief introduction to the Problem: Construction accident studies often overlook the internal perspective of employees on site accidents' impact on corporate reputation.

Purpose: This study investigates the effects of construction site accidents on corporate reputation from an internal viewpoint of stakeholders, focusing on employees. It also determines the extent of the association between site accidents and corporate reputation in middle-income economies.

Design/methodology/approach: A quantitative approach was used, with 150 survey questionnaires administered to employees in construction firms using purposive sampling. Descriptive and inferential statistical tools, including the Pearson correlation and factor analysis, were used to analyse the results.

Findings: Site accidents have 17 identified effects on corporate reputation, negatively impacting leadership, financial management, ethics, shareholder value, and sustainability.

Originality: This study highlights the significant impact of construction site accidents on corporate reputation from an internal perspective of employees and identifies the need for more research on this issue. It has the potential to influence construction health and safety research focus, which has previously not addressed the issue of corporate reputation from an internal perspective.

***Corresponding author: Michael Adesi**, Department of Construction Technology and Management, College of Art and Built Environment, Faculty of Built Environment, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, E-mail: adesimichael@yahoo.com

De-Graft Owusu-Manu, Department of Construction Technology and Management, College of Art and Built Environment, Faculty of Built Environment, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, E-mail: d.owusumanu@gmail.com

Frank Boateng, Department of Management Studies, University of Mines and Technology, Tarkwa, Ghana, E-mail: fboateng28@gmail.com

Moses Ahiabu, Department of Building Technology, Ho Technical University, Ho, Ghana, E-mail: mosesahiabu@yahoo.com

1 Introduction

Construction sites account for 20% of occupational fatalities annually in the US (Earnest et al. 2019). In Europe, 2.9% of occupational injuries occur in the construction industry in the UK (Health and Safety Executive 2021). Equally, construction site accidents in Denmark account for 13.1% of injuries and fatalities (Hansen et al. 2022). The rate of construction site injuries and fatalities is higher in developing countries than in advanced nations (Rai et al. 2021). For instance, Kenya has 74% of construction site accidents (Raymond et al. 2017). In addition, 58.65% and 32.4% of site accidents occur in the construction sector of Ethiopia and Uganda, respectively (Kiconco et al. 2019; Ashuro et al. 2021). In Ghana, construction site accidents account for 57.9% of injuries and fatalities among workers in the sector (Amissah et al. 2019). Construction site accidents hinder the development of corporate reputation as a strategic resource in the sector.

Corporate reputation refers to the organisational behaviours and actions that affect stakeholders' perception about the organisation (Rashid and Mustafa 2021). In addition, corporate reputation drives customers, employees and investors to make major inputs to the development of organisations (Pérez-Cornejo et al. 2021). In terms of strategy, corporate reputation enhances differentiation and access to resources by firms (Baruah and Panda 2020). Similarly, corporate reputation has the potential to improve credibility and investor value of the firm (Zimon et al. 2022).

Existing studies on corporate reputation have demonstrated its relationship with financial performance and stakeholders including its impact on firm size in developed countries (Schaarschmidt and Walsh 2020; Franco and Haase 2021). However, most of the existing studies have not addressed the effects of site accidents on corporate

reputation from the internal perspectives of employees in construction firms. Thus, the aim of this study is to investigate the effects of site accidents on corporate reputation from the internal perspective of employees who are also stakeholders in construction firms. The study will also delve into the degree of association between causes of site accidents and corporate reputation based on the internal viewpoint of employees in construction firms in developing countries. The literature on corporate reputation and accidents in the construction industry was reviewed. The theoretical framework, research methodology, analysis, discussion and conclusion are key components of this article.

2 Theoretical framework

2.1 Accidents in construction

The construction industry is prone to hazards and dangers, which cause severe accidents and lead to high fatality rates (Rostamzadeh et al. 2022). Construction site accidents have been categorised as contact, slip and strip, and fall-related (Kang and Ryu 2019). For instance, Rafindadi et al. (2022) used the analytical hierarchy process (AHP) model to identify five sub-factors for fall-related accidents in construction sited. Studies have also categorised the causes of construction site accidents as management factors (Hamid et al. 2019; Al Zarooni et al. 2022; Birhane et al. 2022; Chan et al. 2022; Deng et al. 2022; Khanh and Kim 2022; Zeng et al. 2022) and unsafe job site conditions (Hassanain et al. 2022; Rahman et al. 2022; Zermane et al. 2022). Furthermore, the causes of construction site accidents are classified as worker-related, which are due to the actions of workforce (Bidhendi et al. 2022; Dolez et al. 2022; Kim and Kang 2022; Koc et al. 2022; Liang et al. 2022; Rafindadi et al. 2022; Wu et al. 2022).

Investigations on the Ghanaian construction industry have shown that Ghana is highly prone to accidents that lead to injuries and fatalities, despite regulations to control the phenomenon (Eyiah et al. 2019; Boadu et al. 2020). Thus, Kheni et al. (2010) noted that the rate of accidents in the Ghanaian construction industry is higher than the International Labour Organisation's (ILO) estimate for emerging economies. Similarly, Osei-Asibey et al. (2021) noted that the national average for construction accidents in Ghana remains high and underreported due to the lack of safety officers.

Recent studies on construction safety and accidents in Ghana focused on construction safety culture (Sherratt

and Aboagye-Nimo 2022), impacts of accidents and hazards (Osei-Asibey et al. 2021), health status of young construction workers (Frimpong et al. 2022) and health and safety knowledge transfer by Williams et al. (2021). These studies identified issues such as lack of education and training, prevalence of musculoskeletal disorders, substance abuse and mental health problems. The review of related studies on construction site accidents in Ghana indicates corporate reputation has received less attention.

2.2 Corporate reputation

There are several definitions of corporate reputation based on the context of scholarly investigations. However, Bigus et al. (2023) indicated that general definitions of corporate reputation exist in the literature. For instance, corporate reputation refers to the overall appeal or attractiveness of a firm 'relative to that of its rivals' (Lange et al. 2011; Fombrun 2012; Bigus et al. 2023, pp. 11). Some of the definitions of corporate reputation focused on stakeholders as demonstrated in Fombrun and Shanley's (1990) definition of corporate reputation as a signal of a company's status to stakeholders, while Saxton (1997) explained it as stakeholders' perception of a firm's key attributes or characteristics. Within the context of stakeholders, DeJong et al. (1985, p. 89) defined corporate reputation as the expectation of a principal regarding the future performance of 'an agent'. Other studies refer to corporate reputation as stakeholders' general view of a company's ability to produce high-quality goods and services (Fombrun 1996; Kim et al. 2018); and the relative success of a firm by meeting the expectation of multiple stakeholders (Chalmers and Godfrey 2004). Corporate reputation is an intangible asset for attracting employees and stakeholders of organisations (Gu et al. 2022). Stakeholders and society perceive the identity of organisations through the lens of corporate reputation (Harvey et al. 2022). The focus of this study on employees as internal stakeholders in construction firms is appropriate as most of the definitions of corporate reputation cited in this article emphasise stakeholders. Thus, this study focused on a specific aspect of stakeholders, notably construction professionals, employed to execute various projects.

Corporate reputation creates competitive advantage and serves as a measure of quality leading to a positive image and survival of firms (Quintana-García et al. 2021). Activities undertaken to improve corporate reputation include quality management innovativeness, long-term investment, financial soundness, recruitment

of talented people, responsibility to the community and environment and appropriate use of corporate assets (Choi et al. 2022).

Corporate reputation has been evaluated from different perspectives, notably leadership, quality of products, financial performance, employee behaviour and environmental and social responsibility (Zakerean 2021).

Bigus et al. (2023, p. 24) performed a systematic literature review and found that ‘there is lack of studies that measure stakeholders’ perspectives’ as a means of assessing a company’s attributes. Das et al. (2023) found that workforce agility, transformational leadership and talent management improve corporate reputation in the information technology sector. In a systematic literature review on corporate reputation in higher education, Mateus and Acosta (2022) found that scholarly contributions to the development of the theory are significant in the banking, service, retail, tourism and hospitality sectors and proposed a framework that focuses on the influence of stakeholders and benefits for improving it. The drivers of corporate reputation explored by Ghuslan et al. (2021) demonstrate that effective corporate reputation and the quality of both environmental and social reporting have a positive influence on corporate reputation. Similarly, Limbunan and Daromes (2022) found that managerial and corporate social performance influence corporate reputation of companies listed on stock exchange. On the contrary, the existing literature demonstrates that corporate reputation positively drives word of mouth, customer trust and satisfaction (Fatmawati and Fauzan 2021; Hasan and Hossain 2021). It is apparent that the prior studies on corporate reputation have not been undertaken with much focus on the internal stakeholders, notably employees in construction firms. This phenomenon is consistent with Mateus and Acosta (2022) and Das et al. (2023) who have earlier indicated the scope of corporate reputation investigations. Thus, this study on the influence of construction site accidents on corporate reputation is appropriate and timely.

2.3 Signalling theory

Theoretically, this study is entrenched in the signalling theory, which deals with how the actions of firms send cues to stakeholders and influence them (Maden et al. 2012). According to the signalling theory, corporate reputation is perceived as an information that indicates the behaviour and quality of firm performance (Walker 2010). Activities of firms that tend to serve as cues or signals to stakeholders include strategic postures and social responsibility

actions (Vander and d’Angelo 2022). Other aspects of the signalling theory include market signals, institutional signals and strategic signals (Zerbini 2017; Constantino et al. 2021; Salam and Jahed 2023). Market signals refer to unintentional information sent to stakeholders such as competitors, customers, suppliers, governments, bondholders and communities (Herbig 1996). The institutional signals are sent by organisations to influence the behaviour and attitude using logos, slogans and branding elements (Constantino et al. 2021). Strategic signals provide early warnings for future events and used to position the firm for potential changes in the environment (Carvalho 2021). Within the signalling theory, the sender is the organisation, while the receivers are the stakeholders. This study adapted the signalling theory because construction site accidents have the potential to send cues that portray a negative image of the construction firm with poor safety records on site.

3 Research methodology

The study adopted a quantitative approach in which survey questionnaires were used to collect data from professionals in the construction industry. The professionals involved in the study include quantity surveyors, architects, project managers, engineers and safety officers because they operate on construction sites. Purposive sampling was used to select participants from construction firms. Purposive sampling is the selection of participants with specific characteristics and information to address the research question, aim and objectives during an investigation (Campbell et al. 2020). In this study, purposive sampling was adopted because the target participants were identifiable and possess critical information on construction site accidents and how they affect corporate reputation. Moreover, purposive sampling was chosen because the study focused on internal stakeholders who are employees of construction firms with specific information on site accidents and how it affects the reputation of their organisations. The use of the purposive sampling in this study is supported by Etikan et al.’s (2016) view about its usefulness for studies that target specific attributes of respondents.

The survey questionnaire was in three sections. The first section focused on the demographic information of respondents, such as respondents’ position in the firm, academic and professional background, work experience and classification of construction firms. The second section focused on the causes of construction site accidents. Although previous investigations focused

on construction site accidents, in this study, it was necessary to ascertain their current level of occurrence. The third section focused on the effects of construction site accidents on the corporate reputation of construction firms. The variables for the questions in sections 2 and 3 were adapted during the review of related studies on causes of construction accidents and their effects. The 5-point Likert scale of measurement was anchored on 1 = strongly disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree and 5 = strongly agree to ascertain participants' view on the effects of construction site accidents on corporate reputation.

This study adopted the Cronbach alpha test to ascertain the reliability and validity of the 5-point Likert scale for collecting data. The result of the Cronbach alpha test is shown in Table 1.

The value of the Cronbach alpha is between 0 and 1, where 1 denotes the highest level of consistency. From Table 1, the Cronbach alpha values of 0.856 and 0.849 are good since they are above 0.80 and closer to 1, indicating that reliability of the survey questionnaire is good culminating into the consistency of responses. Validity focuses on the accuracy of the data collection instrument; hence, face validity was addressed by ensuring a logical presentation of questions administered to the participants and piloting the instruments with 10 academics and 10 construction professionals. Face validity is the subjective agreement of professionals that a scale of measurement logically reflects the items measured (Zikmund et al. 2013). The piloting of the questionnaire demonstrated that the professionals found the scale of measurement for the test items suitable, leading to the attainment of face validity. Furthermore, piloting the questionnaire enabled its revision to address the suggestions made by the participants in terms of presentation and accurate measurement of variables.

The identified elements of the target population for this study include project managers, engineers, architects, quantity surveyors and safety officers who have been involved in construction site operations. A total of 150 survey questionnaires were administered to the participants using an online tool in which 97 questionnaires were returned for analysis with a response rate of 65%. The sample size for analysis in previous studies differs

from one study to another. For instance, Mohandes et al. (2022) used 23 experts for the causal analysis of construction site accidents. Kruger et al. (2012) noted that three well-defined industry experts are sufficient for analysis. Since the researchers have clearly identified and defined elements of the target population for this study based on their field of expertise, the 97 questionnaires retrieved for analysis are sufficient to represent the sample size. Both descriptive and inferential statistics were used for the analysis of the results. The descriptive statistical tools used include the mean, standard deviation and percentages to ascertain the trend within the data, while factor analysis and Pearson correlation were adopted for inferential analysis. The Pearson correlation, which is an inferential statistical tool, was used to demonstrate and ascertain the relationship between construction site accidents and their effects on corporate reputation.

4 Analysis and discussion of results

The analysis and discussion of the results in this section focused on the causes of accidents and the impacts of construction site accidents on the corporate reputation of construction firms using descriptive analytical tools. The second level of the analysis involved the use of factor analysis to identify the inherent factors within the result regarding the effects of construction site accidents on corporate reputation. Pearson correlation was also undertaken to ascertain the degree of association between the causes of site accidents and their effects on the corporate reputation of construction firms.

4.1 Profile of respondents

According to Lee and Schuele (2010), the demographic information of participants demonstrates the representativeness of the target population. Thus, it is necessary to provide the demographic information of participants using Figures 1–4 to show the position, profession, academic background and work experience of respondents.

Figure 1 shows that study participants are managers, chief executive officers (CEOs) and staff of construction firms. In Figure 1, CEOs constitute 11% of respondents, while 7% of participants are managers. The majority of those involved in the study are staff of construction firms, representing 82% of participants. Figure 1 shows that the study involved the key segment of the target population in the investigation ranging from top management to those

Tab. 1: Reliability and validity.

Construct	Cronbach alpha
Causes of construction site accidents	0.856
Effects of accidents on corporate reputation	0.849

at the lower level of the organisational hierarchy of construction firms.

The study also delved into the professional background of respondents in which 26% project managers; 18% are quantity surveyors and engineers, respectively; and 16% are architects, as shown in Figure 2.

Furthermore, Figure 3 demonstrates the academic background of participants in which 14% have a master of science (MSc) degree and 40% obtained higher national diploma (HND)/diploma. Overall, the majority of the participants have a bachelor of science (BSc) degree in construction-related disciplines.

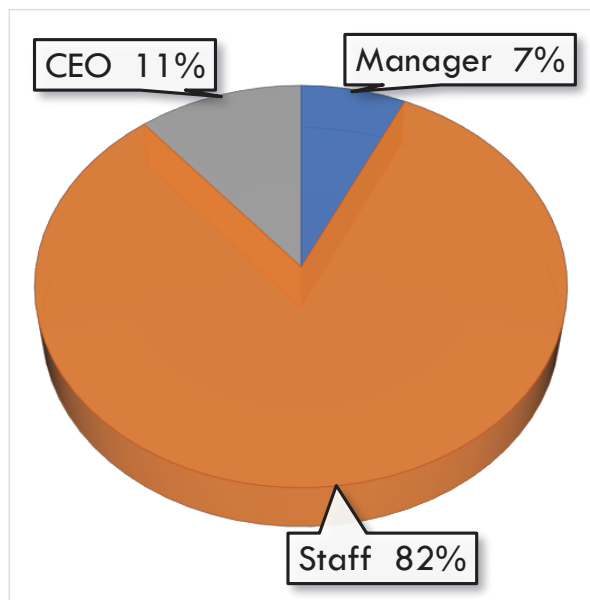


Fig. 1: Respondents' position.

The majority of the respondents have considerable work experience, as shown in Figure 4. This indicates that the respondents have the requisite information that enable them to respond to issues regarding the effects of construction accidents on corporate reputation in construction firms.

4.2 Causes of accidents on construction sites

The next section of the article focused on the descriptive analysis of the causes of construction accidents and their effects on the corporate reputation of construction firms, as given in Table 2.

Table 2 demonstrates that accidents on construction sites continue to occur despite the fact that numerous studies have been undertaken on this phenomenon. Table 2 shows that lack of attention leads to scaffolding accidents at construction sites, which has a weighted mean of 4.15 and ranked 1st among the 12 variables representing the causes of accidents on construction sites. Other critical issues that cause accidents on construction sites, as indicated in Table 2, include poor design, such as improper load location (dead loads), incorrectly constructed foundation or inadequate foundation for a given project leading to building collapse. Similarly, Table 2 indicates that lack of fall protection for workers on elevated structures causes accidents. The weighted mean values of all the 12 causes of construction accidents in Table 2 are above 3 and 4, indicating that the causes of accidents on construction sites remain a major problem for professionals in the industry. The results in Table 2 are consistent with the findings of

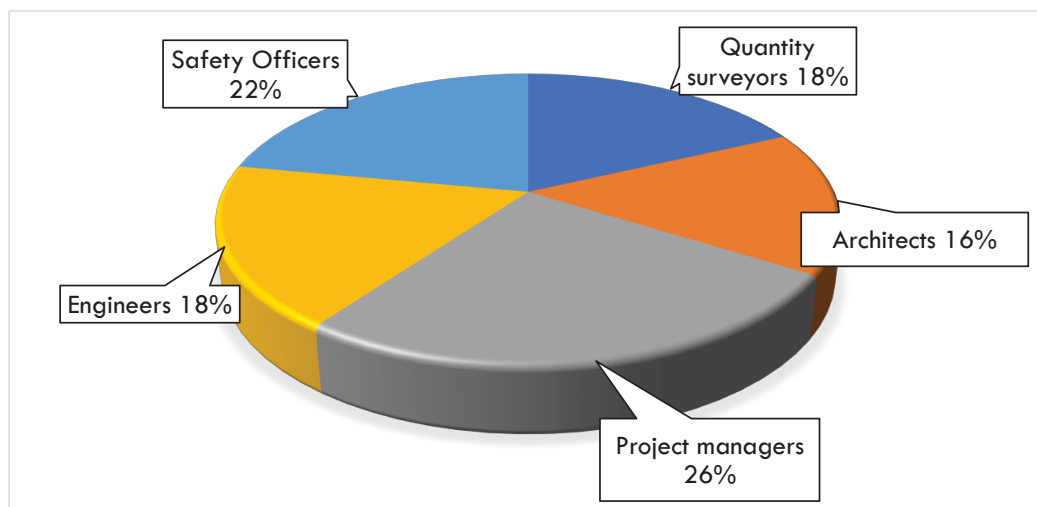


Fig. 2: Respondents' profession.

earlier studies on the causes of construction accidents by Rahman et al. (2022), Al Zarooni et al. (2022), and Hamid et al. (2019).

4.3 Effects of construction site accidents on corporate reputation

While a plethora of studies exist on causes of construction accidents, much of them have not received the needed attention in terms of their effects on the corporate reputation of construction firms. This article presents the results regarding the effects of construction site accidents on corporate reputation in Table 3.

At the descriptive level of analysis, the results show that the 17 variables in Table 3 affect corporate reputation of construction firms since their weighted means are above 3.5. Also, in Table 3, 12 of the impacts of construction accidents on corporate reputation have their weighted mean above 4.00, while 5 of them have a weighted mean

above 3.00. This indicate construction site accidents are adversely affecting the corporate reputation of construction firms. For instance, Table 3 shows that loss of revenue leading to bankruptcy, delayed progress causing time and cost overrun, loss of productivity and low output, legal dispute in court for compensation and perception of the firm as not promoting wellbeing of workers are the highest ranked effects of construction site accidents on corporate reputation.

4.4 Correlation between causes of construction site accidents and corporate reputation of firms

This study also delves into the correlation of the variables using the Pearson correlation, as shown in Table 4.

Pearson correlation was used to ascertain the relationship between causes of construction site accidents and their effects on the corporate reputation of the firms involved in this investigation. A Pearson coefficient of 1 shows a direct positive correlation between the variables. The test indicates a correlation factor of 0.745 in Table 4, which shows that causes of construction site accidents are related to its subsequent effects on corporate reputation shown in Table 3. This implies that construction site accidents have various effects on the corporate reputation of construction firms.

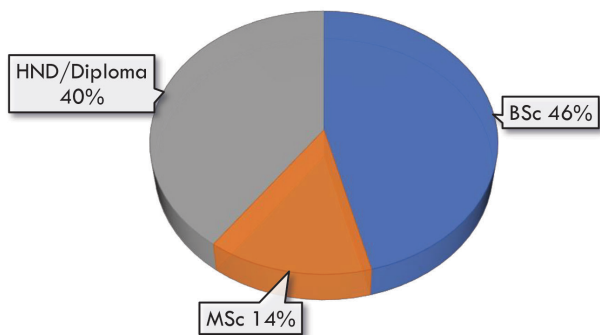


Fig. 3: Respondents' academic background.

4.5 Factor analysis

This section of the article focuses on identifying and categorising the common factors related to the causes of

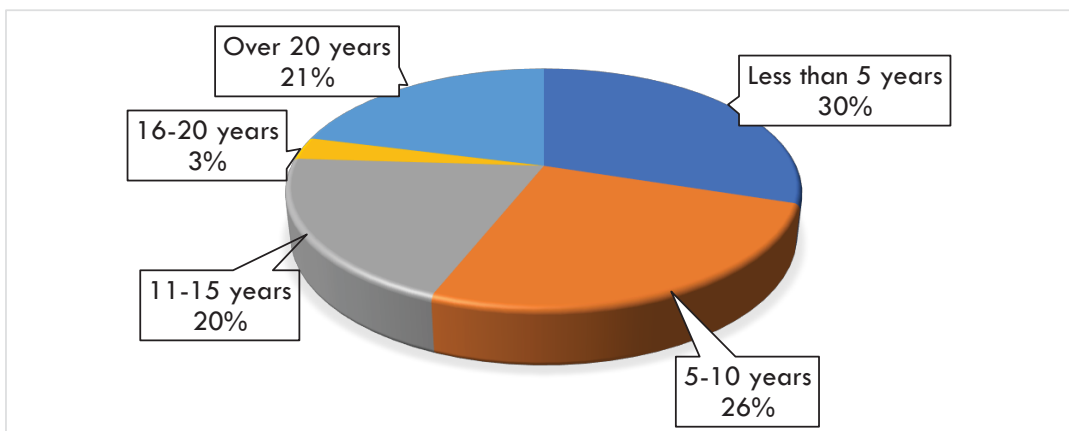


Fig. 4: Respondents' Work experience.

Tab. 2: Causes of construction site accidents.

Cause of accidents on construction sites	Weighted mean	Std. deviation	Ranking
1. Lack of attention during site operations involving scaffolds	4.15	1.00	1st
2. Poor design and improper load location	4.02	1.08	2nd
3. Lack of fall protection for workers at elevated structures	4.01	1.11	3rd
4. Lack of protection from falling objects	4.00	1.08	4th
5. Lack of awareness about the use of personal protective equipment	3.98	1.07	5th
6. Uneven surfaces that are damp, slippery with exposed cables	3.95	1.18	6th
7. Lack of safety precautions for those working near power lines	3.92	1.17	7th
8. Lack of safety guards for tools on power tools	3.91	1.11	8th
9. Using unsafe and non-responsive equipment	3.87	.86	9th
10. Working close to unsafe adjacent property without support	3.78	.99	10th
11. Lack of protection those working in trenches	3.71	1.12	11th
12. Conflict with workers	3.40	1.11	12th

Tab. 3: Construction site accidents and corporate reputation.

Effects of construction site accidents on corporate reputation	Weighted mean	Std. deviation	Ranking
1. Loss of revenue leading to bankruptcy	4.29	0.93	1st
2. Delayed progress causing time and cost overrun	4.27	0.79	2nd
3. Loss of productivity and low output	4.22	0.94	3rd
4. Legal dispute in court for compensation	4.18	0.85	4th
5. Perception of the firm as not promoting wellbeing of workers	4.17	0.92	5th
6. Leads to loss of resources	4.11	0.96	6th
7. Company loses the credibility for quality project	4.09	0.96	7th
8. Site accidents leading to pollution of water resources creates negative image for the company	4.09	1.00	8th
9. Low self-esteem of workers and lack of motivation	4.08	0.99	9th
10. Incompetency of company management to effectively handle occupational health and safety	4.06	1.03	10th
11. Loss of opportunities to partner foreign firms	4.05	0.89	11th
12. Causes negative changes in organisational goals that affect share of client	4.03	0.82	12th
13. Site activities leading to dirt and mud on local roads creates bad image for the company	3.97	1.00	13th
14. Loss of lives creates shortage of skills	3.94	1.18	14th
15. SWO issued to due to accidents delay projects	3.93	0.94	15th
16. Additional resources required to improve progress of work	3.89	0.93	16th
17. Rampant accidents lead to illegal modification of safety standards to cover up non-compliance	3.72	1.02	17th

SWO, stop work orders.

Tab. 4: Correlation between causes of construction accidents and their effects on corporate reputation of construction firms.

		Causes	Impacts
Cause	Pearson correlation	1	0.745
	Sig. (two-tailed)		0.000
	N	97	97
Effects	Pearson correlation	0.745	1
	Sig. (two-tailed)	0.000	
	N	97	97

construction site accidents and corporate reputation. The communalities of the factor analysis were between 0.587 and 0.789, demonstrating that the variables explained the common factors for construction site accidents and corporate reputation. The factor analysis indicated five main components that had their initial eigenvalues above 1 for extraction, as shown in the scree plot in Figure 5.

The component matrix of the factor analysis shows that three variables have their factor loadings below 0.5,

which were eliminated. The variables eliminated due to low factor loading consist of loss of lives creates shortage of skills, stop work orders (SWO) due to accidents and additional resources required to improve progress of work.

5 Discussion of results

The Pearson correlation in Table 4 shows that construction site accidents have varied effects on the corporate reputation of construction firms. However, these effects of construction site accidents on corporate reputation of firms have not been extensively explored by previous studies. This section of the article discusses the impacts of construction site accidents and their association with the components of corporate reputation identified using the factor analysis in Table 5.

5.1 Component 1: Leadership and management

Corporate reputation and leadership are important to the managers of firms as it enhances the image and branding of organisations. Within the context of this study, the result in Table 5 shows that construction site accidents make it difficult for construction firms to achieve their organisational goals. In addition, accidents on construction sites lead to legal disputes in court, which affects the ability of

leaders and managers to enhance the reputation of their organisations. The leadership and management component of corporate reputation are negatively affected by construction site accidents because it signals to stakeholders that the company prioritises profit over the welfare of employees and prevalence of poor site management practices. The finding pertaining to the effects of construction site accidents on leadership and management is consistent with the assertion of Willis et al. (2017) that environments with high exposure to accidents pose challenges to the leadership and management of construction firms. However, Wu et al. (2017) noted that improved leadership enhances construction safety; they have not been able to demonstrate the relationship between site accidents and corporate reputation dimensions identified using factor analysis in this study.

5.2 Component 2: Organisation ethics

Organisational ethics consist of principles and guidelines firms adopt to determine the right behaviour and conduct of employees. The behaviour and conduct of employees on construction site can lead to accidents that will affect corporate reputation. Table 5 shows that frequent accidents at construction sites have the potential to make management to modify safety codes to hide non-compliance of safety practices culminating into unacceptable

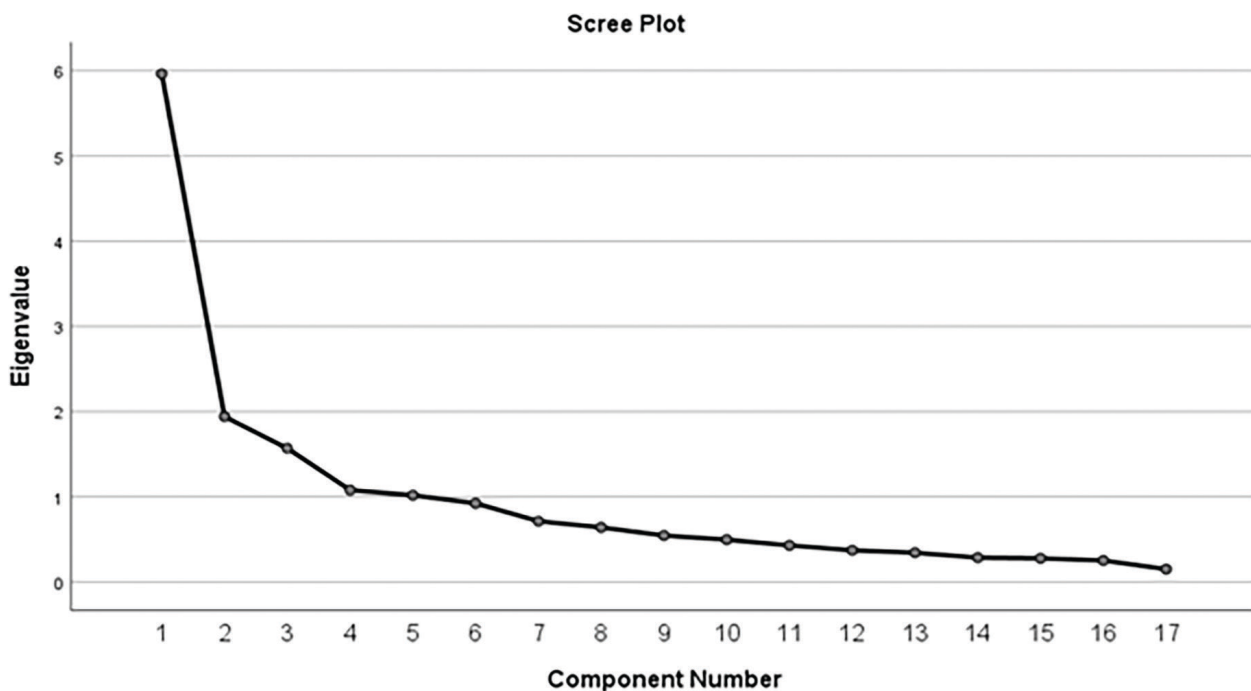


Fig. 5: Scree plot.

Tab. 5: Common factors for effects of construction site accidents on corporate reputation.

Factor profile of impacts of construction site accidents on corporate reputation	Factor loading	Variance explained
Component 1: Leadership and management		
Causes negative changes in organisational goals that affect share of client	0.513	35.067
Legal dispute in court for compensation	0.636	
Component 2: Organisation ethics		
Company loses the credibility for quality project	0.589	11.412
Rampant accidents lead to illegal modification of safety standards to cover up non-compliance	0.659	
Component 3: Financial management		
Loss of revenue leading to bankruptcy	0.754	9.225
Loss of productivity and low output	0.589	
Delayed progress causing time and cost overrun	0.565	
Leads to loss of resources	0.722	
Component 4: Shareholder value		
Loss of opportunities to partner foreign firms	0.559	6.348
Incompetency of company management to handle effectively occupational health and safety	0.730	
Component 5: Organisational sustainability		
Site accidents leading to pollution of water resources creates negative image for the company	0.658	5.988
Perception of the firm as not promoting wellbeing of workers	0.615	
Low self-esteem of workers and lack of motivation	0.537	
Site activities leading to dirt and mud on local roads create bad image for the company	0.505	

managerial conduct and behaviours in the organisation. Again, high rates of construction accidents tend to signal poor quality to the stakeholders, which leads to loss of credibility in construction firms. Existing studies such as Vander and d'Angelo (2022) and Heinberg et al. (2018) indicate that the actions and conduct of organisations serve as signals or cues that translate into either good reputation or bad reputation. Indeed, this study has indicated that construction site accidents are signals or cues to the stakeholders, which can have impacts on the ethical dimension of corporate reputation of construction firms.

5.3 Component 3: Resource and financial management

In Table 5, four variables are loaded onto financial management component of corporate reputation. The two variables that are strongly associated with financial management element of corporate reputation include loss of revenue and bankruptcy due to inability to win contracts as a result of high rate of accidents. The second variable with a high factor loading under the financial management component of corporate reputation is loss of resources due to damaged equipment or plant, property, material and finished work during site accidents. This implies that resources and revenue lost due to accidents

on sites negatively affect the credibility that stakeholders have for construction firms. Loss of productivity leads to low output, and project delay has a moderate association with the financial management component of corporate reputation. Within the resource-based view, corporate reputation is rare, valuable and immutable, which translate into financial resources (Roberts and Dowling 2002).

5.4 Component 4: Shareholder value

The result in Table 5 shows the two main effects of construction site accident on the shareholder value component of corporate reputation. These effects include loss of knowledge transfer opportunities through partnership with foreign firms and perception of the company as incompetent in managing occupational and organisational safety. In addition, rampant site accidents serve as unfavourable signals that make shareholders to perceive the company as not being able to create value for their investment. Raithel and Schwaiger (2015) found that superior corporate reputation creates wealth for shareholders due to the positive perception of the company. This study expanded the finding of Raithel and Schwaiger (2015) and Barney (2001) on corporate reputation and shareholder value by demonstrating that construction site accidents or lack of occupational and organisational

safety undermines good corporate reputation, which subsequently affect shareholder value.

5.5 Component 5: Organisational sustainability

The result in Table 5 shows that construction site accidents affect the organisational sustainability component of corporate reputation. In this study, the effects of construction site accidents on the sustainability dimension of corporate reputation shown in Table 5 include site accidents leading to pollution of water resources creates negative image for the company, perception of the firm as not promoting wellbeing of workers, low self-esteem of workers and lack of motivation, and site activities leading to dirt and mud on local roads create bad image for the company. The results relating to pollution of water bodies and site activities disrupting access roads demonstrate issues relating to environmental sustainability, which are consistent with the results of the study by Choi et al. (2022) that identified responsibility to the community and environment as key components of corporate reputation. Thus, this study demonstrates the importance of environmental sustainability as a key aspect of corporate reputation and not only economic sustainability as far as corporate organisations are concerned.

6 Conclusion

This study focused on construction site accidents and corporate reputation of construction firms in emerging economies. Hitherto this study, numerous scholarly investigations have focused on construction site accidents and safety without much attention to corporate reputation. Therefore, this study ascertained the various nuances inherent in construction site accidents and corporate reputation. The study demonstrated that construction site accidents affect key aspects of corporate reputation such as leadership and management, organisation ethics, resource and financial management, shareholder value and organisational sustainability. This shows that site accidents in the construction industry become signals that have the potential to influence stakeholders. The study also has the potential to positively influence top management decision-making regarding site accidents as they affect the corporate reputation of construction firms.

This investigation addressed a cross-disciplinary issue of construction site accidents and corporate reputation,

which enhances the understanding of how construction accidents affect the reputation of construction firms. The study also opens a new area for further investigation in terms of improving the reputation of construction firms from the perspective of accidents encountered at project sites. This investigation will enable construction firms to identify the various aspects of corporate reputation affected by construction site accidents. This implies that construction firms will devise strategies to mitigate the negative effects of construction site accidents on the five major components of corporate reputation identified in this study. Since the qualitative aspect of this study has not been explored, a further study involving experts in top management of construction firms will be appropriate. The study recommends that construction firms must develop corporate policies that improve the five components of corporate reputation, namely, leadership and management, organisation ethics, resource and financial management, shareholder value and organisational sustainability.

References

- Al Zaroony, M., Awad, M., & Alzaatreh, A. (2022). Confirmatory factor analysis of work-related accidents in UAE. *Safety Science*, 153, p. 105813. doi: 10.1016/j.ssci.2022.105813.
- Amisssah, J., Badu, E., Agyei-Baffour, P., Nakua, E. K., & Mensah, I. (2019). Predisposing factors influencing occupational injury among frontline building construction workers in Ghana. *BMC Research Notes*, 12(1), p. 728. doi: 10.1186/s13104-019-4744-8.
- Ashuro, Z., Zele, Y. T., Kabthmyer, R. H., Diriba, K., Tesfaw, A., & Alamneh, A. A. (2021). Prevalence of work-related injury and its determinants among construction workers in Ethiopia: A systematic review and meta-analysis. *Journal of Environmental and Public Health*, 7(1), pp. 1-7. doi: 10.1155/2021/9954084.9954084.
- Barney, J. B. (2001). Is the resource-based "view" a useful perspective for strategic management research? Yes. *Academy of Management Review*, 26(1), pp. 41-56.
- Baruah, L., & Panda, N. M. (2020). Measuring corporate reputation: A comprehensive model with enhanced objectivity. *Asia-Pacific Journal of Business Administration*, 12(2), pp. 139-161.
- Bidhendi, A., Arbabi, H., & Mahoud, M. (2022). Perceived effect of using BIM for improving construction safety. *Asian Journal of Civil Engineering*, 23(1), pp. 695-706.
- Bigus, J., Hua, K. P. M., & Raithel, S. (2023). Definitions and measures of corporate reputation in accounting and management: Commonalities, differences, and future research. *Accounting and Business Research*, doi: 10.1080/00014788.2022.2149458.
- Birhane, G. E., Yang, L., Geng, J., & Zhu, J. (2022). Causes of construction injuries: A review. *International Journal of Occupational Safety and Ergonomics*, 28(1), pp. 343-353.

- Boadu, E. F., Wang, C. C., & Sunindijo, R. Y. (2020). Characteristics of the construction industry in developing countries and its implications for health and safety: An exploratory study in Ghana. *International Journal of Environmental Research and Public Health*, 17(11), p. 4110.
- Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., et al. (2020). Purposive sampling: Complex or simple? Research case examples. *Journal of Research in Nursing*, 25(8), pp. 652-661.
- Carvalho, P. (2021). Weak signals: Early warnings of what is coming. Available at https://www.researchgate.net/publication/352030676_WEAK_SIGNALS_EARLY_WARNINGS_OF_WHAT_IS_COMING [accessed 2 May, 2023].
- Chalmers, K., & Godfrey, J. M. (2004). Reputation costs: The impetus for voluntary derivative financial instrument reporting. *Accounting, Organizations and Society*, 29(2), pp. 95-125. doi: 10.1016/S0361-3682(02)00034-X.
- Chan, A. P., Yang, Y., Choi, T. N., & Nwaogu, J. M. (2022). Characteristics and causes of construction accidents in a large-scale development project, *Sustainability*, 14(8), pp.1-25.
- Choi, L., Kim, M., & Kwon, H. B. (2022). Impact of customer-based corporate reputation on customer engagement behaviours: Customer identification and brand love as mediators and industry type as a moderator. *Journal of Brand Management*, 29(2), pp. 150-166.
- Constantino, S. M., Pianta, S., Rinscheid, A., Frey, R., & Weber, E. U. (2021). The source is the message: The impact of institutional signals on climate change-related norm perceptions and behaviors. *Climatic Change*, 166(1), pp. 1-18.
- Das, K. P., Mukhopadhyay, S., & Suar, D. (2023). Workforce agility, firm performance, and corporate reputation: Evidence from Indian IT firms, *Asia Pacific Management Review*, 28(1), pp. 33-44. doi: 10.1016/j.apmr.2022.01.006.
- DeJong, D. V., Forsythe, R., & Lundholm, R. J. (1985). Ripoffs, lemons, and reputation formation in agency relationships: A laboratory market study. *The Journal of Finance*, 40(3), pp. 809-820.
- Deng, S., Cai, Y., Xie, L., & Pan, Y. (2022). Group management model for construction workers' unsafe behaviour based on cognitive process model. *Engineering, Construction and Architectural Management*, Vol. ahead-of-print No. ahead-of-print. doi: 10.1108/ECAM-12-2021-1073.
- Dolez, P. I., Marsha, S., & McQueen, R. H. (2022). Fibers and textiles for personal protective equipment: Review of recent progress and perspectives on future developments. *Textiles*, 2(2), pp. 349-381.
- Earnest, S., Echt, A., Garza, E., Snawder, J., & Rinehart, R. (2019). Wearable technologies for improved safety and health on construction sites. Available at <https://blogs.cdc.gov/niosh-science-blog/2019/11/18/wearables-construction/> [accessed 22 November, 2022].
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), pp. 1-4.
- Eyiah, A. K., Kheni, N. A., & Quartey, P. D. (2019). An assessment of occupational health and safety regulations in Ghana: A study of the construction Industry. *Journal of Building Construction and Planning Research*, 7(2), pp. 11-31.
- Fatmawati, I., & Fauzan, N. (2021). Building customer trust through corporate social responsibility: The effects of corporate reputation and word of mouth. *Journal of Asian Finance, Economics and Business*, 8(1), pp. 793-805.
- Fombrun, C., & Shanley, M. (1990). What's in a name? Reputation building and corporate strategy, *Academy of Management Journal*, 33(2), 233-258.
- Fombrun, C. J. (1996). *Reputation: realizing value from the corporate image*. Harvard Business School Press, Boston.
- Fombrun, C. J. (2012). The building blocks of corporate reputation: Definitions, antecedents, consequences. In: Barnett, M. L., & Pollock, T. G.(eds.), *The Oxford Handbook of Corporate Reputation*. Oxford University Press, pp. 94-113. doi: 10.1093/oxfordhb/9780199596706.013.0005.
- Franco, M., & Haase, H. (2021). The role of reputation in the business cooperation process: Multiple case studies in small and medium sized enterprises. *Journal of Strategy and Management*, 14(1), pp. 82-95. doi: 10.1108/J SMA-01-2020-0012.
- Frimpong, S., Antwi, A. B., Sunindijo, R. Y., Wang, C. C., Ampratwum, G., & Dansoh, A., et al. (2022). Health status of young construction workers in the Global South: The case of Ghana. *Safety Science*, 148, p. 105673. doi: 10.1016/j.ssci.2022.105673.
- Ghuslan, M. I., Jaffar, R., Mohd Saleh, N., & Yaacob, M. H. (2021). Corporate governance and corporate reputation: The role of environmental and social reporting quality. *Sustainability*, 13(10452), pp. 1-24. doi: 10.3390/su131810452.
- Hamid, A. R. A., Azmi, M. N., Aminudin, E., Jaya, R. P., Zakaria, R., & Zawawi, A. M. M., et al. (2019). Causes of fatal construction accidents in Malaysia. *IOP Conference Series: Earth and Environmental Science*, 220(1), p. 012044.
- Hansen, P. W., Schlünssen, V., Fonager, K., Bønløkke, J. H., Hansen, C. D., & Bøggild, H. (2022). Association of perceived work pace and physical work demands with occupational accidents: A cross-sectional study of ageing male construction workers in Denmark. *BMC Public Health*, 22(22), p. 18. doi: 10.1186/s12889-021-12461-6.
- Harvey, W. S., Osman, S., & Tourky, M. (2022). Building internal reputation from organisational values. *Corporate Reputation Review*, 25(1), pp. 19-32.
- Hasan, M., & Hossain, M. M. (2021). Corporate recognition award and reputation dimensions on corporate reputation consequences: A critical review on Bangladesh. *International Journal of Asian Business Information Management*, 12(1), pp. 191-204.
- Hassanain, M. A., Aljuhani, M., Hamida, M. B., & Salaheldin, M. H. (2022). A framework for fire safety management in school facilities. *International Journal of Built Environment and Sustainability*, 9(2), pp. 1-9.
- Health and Safety Executive. (2021). Construction statistics in Great Britain. Available at <https://www.hse.gov.uk/statistics/industry/construction.pdf> [accessed 22 November, 2022].
- Heinberg, M., Ozkaya, H. E., & Taube, M. (2018). Do corporate image and reputation drive brand equity in India and China? – Similarities and differences. *Journal of Business Research*, 86(1), pp. 259-268. Available at <https://www.sciencedirect.com/science/article/pii/S0148296317303363>.

- Herbig, P. (1996). Market signalling: A review. *Management Decision*, 34(1), pp. 35-45. doi: 10.1108/00251749610106954.
- Kang, K., & Ryu, H. (2019). Predicting types of occupational accidents at construction sites in Korea using random forest model. *Safety Science*, 120(1), pp. 226-236.
- Khanh, H. D., Kim, S. Y., & Linh, L. Q. (2022). Construction productivity prediction through Bayesian networks for building projects: Case from Vietnam. *Engineering, Construction and Architectural Management*, Vol. ahead-of-print No. ahead-of-print. doi: 10.1108/ECAM-07-2021-0602.
- Kheni, N. A., Gibb, A. G. F., & Dainty, A. R. J. (2010). Health and safety management within small- and medium-sized enterprises (SMEs) in developing countries: Study of contextual influences. *Journal of Construction Engineering and Management*, 136(10), pp. 1104-1115.
- Kiconco, A., Ruhinda, N., Halage, A. A., Watya, S., Bazeyo, W., & Ssempebwa, J. C., et al. (2019). Determinants of occupational injuries among building construction workers in Kampala City, Uganda. *BMC Public Health*, 19(1), pp. 1-11.
- Kim, J.-B., Song, B. Y., & Stratopoulos, T. C. (2018). Does information technology reputation affect bank loan terms? *The Accounting Review*, 93(3), pp. 185-211. doi: 10.2308/accr-51927.
- Kim, S., & Kang, C. (2022). Analysis of the complex causes of death accidents due to mobile cranes using a modified MEPS method: Focusing on South Korea. *Sustainability*, 14(5), p. 2948.
- Koc, K., & Gurgun, A. P. (2022). Scenario-based automated data preprocessing to predict severity of construction accidents. *Automation in Construction*, 140(1), p. 104351.
- Krueger, T., Page, T., Hubacek, K., Smith, L., & Hiscock, K. (2012). The role of expert opinion in environmental modelling. *Environmental Modelling & Software*, 36(1), pp. 4-18.
- Lange, D., Lee, P. M., & Dai, Y. (2011). Organizational reputation: A review. *Journal of Management*, 37(1), pp. 153-184. doi: 10.1177/0149206310390963.
- Lee, M., & Schuele, C. M. (2010). Demographics. In: Salkind, N. J. (ed.), *Encyclopedia of Research Design Demographics*. SAGE Publications, Inc., Thousand Oaks, p. 347.
- Liang, Q., Zhou, Z., Ye, G., & Shen, L. (2022). Unveiling the mechanism of construction workers unsafe behaviors from an occupational stress perspective: A qualitative and quantitative examination of a stress-cognition-safety model. *Safety Science*, 145(1), p. 105486.
- Limbunan, T., & Daromes, F. E. (2022). Testing the determinants of corporate reputation and their impact on market valuation. *Jurnal Akuntansi*, 26(2), pp. 263-279. doi: 10.24912/ja.v26i2.934.
- Maden, C., Arkan, E., Telci, E. E., & Kantur, D. (2012). Linking corporate social responsibility to corporate reputation: A study on understanding behavioural consequences. *Procedia-Social and Behavioral Sciences*, 58(1), pp. 655-664.
- Mateus, M. A., & Acosta, F. J. (2022). Reputation in higher education: A systematic review. *Frontiers in Education*, 7(1), pp. 1-19. doi: 10.3389/feduc.2022.925117.
- Mohandes, S. R., Sadeghi, H., Fazeli, A., Mahdiyar, A., Hosseini, M. R., & Arashpour, M., et al. (2022). Causal analysis of accidents on construction sites: A hybrid fuzzy Delphi and DEMATEL approach. *Safety Science*, 151(1), p.105730.
- Osei-Asibey, D., Ayarkwa, J., Acheampong, A., Adinyira, E., & Amoah, P. (2021). Impacts of accidents and hazards on the Ghanaian construction industry. *International Journal of Construction Management*. doi: 10.1080/15623599.2021.1920161.
- Pérez-Cornejo, C., de Quevedo-Puente, E., & Delgado-García, J. B. (2021). The role of national culture as a lens for stakeholder evaluation of corporate social performance and its effect on corporate reputation. *BRQ Business Research Quarterly*, 1. doi: 10.1177/23409444211007487.
- Quintana-García, C., Benavides-Chicón, C. G., & Marchante-Lara, M. (2021). Does a green supply chain improve corporate reputation? Empirical evidence from European manufacturing sectors. *Industrial Marketing Management*, 92(1), pp. 344-353. doi: 10.1016/j.indmarman.2019.12.011.
- Rafindadi, A. D. U., Napiah, M., Othman, I., Mikić, M., Haruna, A., & Alarifi, H., et al. (2022). Analysis of the causes and preventive measures of fatal fall-related accidents in the construction industry. *Ain Shams Engineering Journal*, 13(4), p. 101619.
- Rahman, A., Farrok, O., & Haque, M. M. (2022). Environmental impact of renewable energy source based electrical power plants: Solar, wind, hydroelectric, biomass, geothermal, tidal, ocean, and osmotic. *Renewable and Sustainable Energy Reviews*, 161(1), p. 112279.
- Rai, R., El-Zaemey, S., Dorji, N., Rai, B. D., & Fritschi, L. (2021). Exposure to occupational hazards among health care workers in low-and middle-income countries: A scoping review. *International Journal of Environmental Research and Public Health*, 18(5), p. 2603. doi: 10.3390/ijerph18052603.
- Raithel, S., & Schwaiger, M. (2015). The effects of corporate reputation perceptions of the general public on shareholder value. *Strategic management journal*, 36(6), pp. 945-956.
- Rashid, S., & Mustafa, H. (2021). Antecedents of corporate reputation with employees in higher education institutions: A systematic review. *International Journal of Educational Management*, 35(1), pp. 297-309.
- Raymond, K., James, W. K., & Kabubo, C. (2017). Common construction site hazards in Nairobi County, Kenya. *American Journal of Construction and Building Materials*, 1(1), pp. 26-33.
- Roberts, P. W., & Dowling, G. R. (2002). *Corporate reputation and sustained superior financial performance*. *Strategic Management Journal*, 23(12), pp. 1077-1093.
- Rostamzadeh, S., Abouhossein, A., Chalak, M. H., Vosoughi, S., & Norouzi, R. (2022). An integrated DEMATEL-ANP approach for identification and prioritization of factors affecting falls from height accidents in construction industry. *International Journal of Occupational Safety and Ergonomics*, Vol. ahead of print. No. ahead of print. doi: 10.1080/10803548.2022.2052479.
- Salam, M. A., & Jahed, M. A. (2023). CSR orientation for competitive advantage in business-to-business markets of emerging economies: The mediating role of trust and corporate reputation. *Journal of Business & Industrial Marketing*, Vol. ahead-of-print No. ahead-of-print. doi: 10.1108/JBIM-12-2021-0591.
- Schaarschmidt, M., & Walsh, G. (2020). Social media-driven antecedents and consequences of employees' awareness of their impact on corporate reputation. *Journal of Business Research*, 117(1), pp. 718-726.
- Sherratt, F., & Aboagye-Nimo, E. (2022). Decolonizing occupational safety management: The case of construction site safety culture in Ghana. *Safety Science*, 151(1), p. 105732.

- Vander, C. A. E., & d'Angelo, M. J. (2022). Does the signalling of hiring offenders impact corporate reputation? *Corporate Reputation Review*. doi: 10.1057/s41299-022-00142-y.
- Walker, K. A. (2010). A systematic review of the corporate reputation literature: Definition, measurement, and theory. *Corporate Reputation Review*, 12(4), pp. 357-387.
- Williams, J., Fugar, F., & Adinyira, E. (2021). Exploring enablers of health and safety knowledge transfer from construction companies to project host communities. *International Journal of Construction Management*. doi: 10.1080/15623599.2021.2006417.
- Willis, S., Clarke, S., & O'Connor, E. (2017). Contextualizing leadership: Transformational leadership and management-by-exception-active in safety-critical contexts. *Journal of Occupational and Organizational Psychology*, 90(3), pp. 281-305.
- Wu, C., Li, N., & Fang, D. (2017). Leadership improvement and its impact on workplace safety in construction projects: A conceptual model and action research. *International Journal of Project Management*, 35(8), pp. 1495-1511.
- Wu, S., Hou, L., Zhang, G. K., & Chen, H. (2022). Real-time mixed reality-based visual warning for construction workforce safety. *Automation in Construction*, 139(1), p. 104252.
- Zakerean, M. (2021). The relationship between corporate reputation, CEO narcissism, and financial statement comparability. *Iranian Journal of Accounting, Auditing and Finance*, 5(2), pp. 45-59. doi: 10.22067/IJAAF.2021.40336.
- Zeng, X., Huang, N., Han, Y., Yin, Y., & Huang, J. (2022). System dynamics analysis of construction safety risk considering existing railway lines. *Computational Intelligence and Neuroscience*, 2022(1), pp. 1-12. doi: 10.1155/2022/1256975.
- Zerbini, F. (2017). CSR initiatives as market signals: A review and research agenda. *Journal of Business Ethics*, 146(1), pp. 1-23. doi: 10.1007/s10551-015-2922-8.
- Zermane, A., Tohir, M. Z. M., Baharudin, M. R., & Yusoff, H. M. (2022). Risk assessment of fatal accidents due to work at heights activities using fault tree analysis: Case study in Malaysia. *Safety Science*, 151(1), p. 105724.
- Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2013). *Business Research Methods*. Cengage Learning, United Kingdom: South-Western.
- Zimon, G., Arianpoor, A., & Salehi, M. (2022). Sustainability reporting and corporate reputation: The moderating effect of CEO opportunistic behaviour. *Sustainability*, 14(1257), pp. 2-28. doi: 10.3390/su14031257.