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EVALUATION OF CONSTRUCTION STAKEHOLDERS' CONTRIBUTIONS TO SITE ACCIDENTS IN NIGERIA

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ABSTRACT
In recent years, the Nigerian construction sites have recorded a significant number of site accidents which has not only resulted to injuries but to deaths of site operatives. Hence this paper intends to evaluate the contributions of construction stakeholders such as employers, employees to construction site accidents in Nigeria. The paper set out three objectives which are (i) to identify causes of site accidents and rate of prevention (ii) to evaluate the contributions of employee to site accidents and

Introduction

Construction is the most hazardous workplace among various industries. Construction workers engage in many activities that may expose them to serious hazards, such as falling from rooftops, being struck by an object, electrocution or heavy construction equipment, silica, and asbestos dust. Thus, the construction implementation on site requires good safety practices and management. It is an essential element in a construction project which not only to avoid accidents on site but to ensure the successful implementation of the project (Ismail *et al*., 2022). This is because once the accidents occur on the construction site, the project performance in terms of time, cost and quality also would be affected.

Construction industry is playing an important role in economic growth of the country, but it faces many challenges currently that lead to affect project goal and steady growth of the economy (Saleh and Othman, 2022). Construction is a high hazard industry which comprises a wide range of activities involving plan, design, construct, supply, installation, completion, testing, commissioning, alteration, maintains, repairs and eventually demolishes of buildings, civil engineering works, mechanical and electrical engineering and other similar works. Construction is always complex that make industry susceptible to disputes, delays and cost exceeding.

(iii) to evaluate the contributions of employer to site accidents. Quantitative research methodology was adopted by sampling the construction sites in randomly selected districts in FCT, Abuja. The statistical analyses adopted were descriptive analysis which include percentage, frequency counts, Mean Item Score (MIS) and Standard Deviation (St.Dev.). The results of the findings show the highest frequency of occurrence was "Lack of supervision by the supervisor in charge" (MIS = 3.85; St.Dev. = 0.16) whereas, the most severe contribution of employees to construction site accidents was misunderstanding between working trades" (MIS = 3.42; St.Dev. = 0.11) and employers' contribution was in the process of awarding construction contracts where safety factors are not given priority" (MIS = 3.40; St.Dev. = 0.05). It is therefore concluded that enlightenment and adherence on safety rules should be given more priority on construction sites.

Keywords: Safety, rules, stakeholders, accident, construction.

LITERATURE REVIEW

There are many causes of accidents on construction sites that can be found in the literature. In the attempt to ensure safety on the construction sites, parameters that could avoid accidents such as training, temporary traffic barriers, speed reduction, activity area, and workplace safety planning should be adopted. This guideline can ensure that the workers are safe in their work zone, and the effectiveness of the site safety can also be shown. In their view, Ayob *et al*. (2018) and Ismail *et al*. (2022) highlighted that the lack of supervision and adherence to safe work techniques, the negligence of workers to wear PPE and comply with the safe use of tools, vehicles and machines as well as lack of installation and maintenance of the temporary traffic control devices are the factors causing the occupational accidents.

Due to unacceptably high rates of casualties in the building construction industry, several efforts have been made for paradigm shifts from monitoring safety performance to preventive measures, such as using the 'hierarchy of controls' model of hazard management in the construction industry (NIOSH, 2015). To identify and control hazards in building construction, involves a series of processes from the design phase to the construction phase. Hazard control measure is more than simply inspecting out hazards, rather, a measure where both the employers and employees take recognition of characteristics of potential hazards and risks in various stages of construction and the necessary steps to ensure that the hazards are promptly identified and analyzed, and tackled. In view of this, studies have identified the best practices involving the basic strategies for avoiding or reducing the frequency of

accidents on construction sites. These basic strategies are: Engineering Controls; Work practice controls/Administrative controls; and Provision of PPE.

In addition, studies have shown that rates of accidents and injuries in building construction industry are generally high due to the fact that virtually all building construction sites are faced with unsafe conditions, especially in developing countries, exposing construction workers and users of such constructed structures to a wide range of hazards and dangers (Adeagbo *et al*., 2019; Onibhagere, 2020). Lack of adequacy of safety practices in building construction is evident in the numbers of building collapses and fatalities, injuries and damages reported in building construction industry in developing countries. However, most building construction accidents and injuries can be prevented, reduced or eliminated with an effective hazard control system in place, and the right safety education and practices among all stakeholders in building construction (Asogwa *et al*., 2022).

Causes of Accidents on Construction Sites

Most construction accidents occur as a result of poor knowledge of safety, lack of proper training, deficient enforcement of safety rules and regulations, unsafe tools and equipment, unsafe worksite conditions, and poor attitude towards safety (Onibhagere, 2020). According to Eguh and Adenaiya (2020), equipment and machineries, site condition, nature of the industry, management attitude and method, and human elements can directly influence the safety performance in construction industry. Working at height, in adequate safety devices, poor management, lack of obedience to rules on site, negligence of worker, and employing unskilled worker is so common in construction industry that causes the major accident and making damage and injuries. Charehzehi and Ahankoob (2012) stated that human factors are related to personal duty and responsibility, neglect to use protective equipment, utilizing machines and equipment without permission, rushing in operating and doing work, personal factors, service moving and energized equipment, remove safety device, select unsafe position in working, utilizing improper equipment and other unsafe act. Physical factors were addressed to wrong act of another person, unconsidered to accident source, disregard to special procedure, clothes hazard, environment hazard, fire hazard, wrong method or arrangement, assignment of personnel in wrong position, no safety guard in site and other unsafe condition.

In the guidelines of National Institute of Occupational Safety and Health (NIOSH) (2015), employers must comply and abide to the rules as part of their general duties. The set- guidelines include:

i. Providing or maintaining plans or systems of work that are safe and without risks to health;
ii. Involve workers who, often, have the best understanding of the conditions that create hazards, and insights into how they can be controlled;

iii. Identify and evaluate options of controlling, hazards using a hierarchy of controls;
iv. Develop plans with measures to protect workers during emergencies and non-routine activities;
v. Evaluate the effectiveness of existing controls to determine whether they continue to provide protection or whether different controls may be more effective;
vi. Making arrangements for the safe use, handling and storage, or transport of substances;

Rate of Prevention of Accident on Construction Sites

Different activities can cause accident to happen which may result to injuries or deaths. Therefore, accident prevention should be done to decrease the rate of the accidents. According to Ali *et al*. (2010), accident prevention in construction site is not just a matter of setting up a list of rules and making safety inspection, but is required to have a system for managing health and safety which meets and complies with the law. In the light of this, Eguh and Adenaiya (2020) identified several accidents preventive measures put in place by construction firms on site. These accidents' preventive measures are safety and health rules, regulation and policy, personal protective equipment, housekeeping, fire prevention and fire extinguishers, tool inspection, emergency procedures, safety bulletin board, construction safety meeting, first aid training and incident investigation. Reporting further, Eguh and Adenaiya (2020) revealed that the rate at which the accident preventive measures are implemented on construction site is low due to poor safety behaviour because 75% of workers do not obey the rules in Nigeria.

AIM

This paper aimed at evaluating the contributions of construction stakeholders in the construction sites accident in FCT, Abuja.

OBJECTIVES

Three objectives are set for the paper. These are: -

(i) To identify causes of accidents and rate of prevention on Nigeria construction sites
(ii) To examine the employee's contribution to accidents on construction sites
(iii) To examine the employer's contribution to accidents on construction sites

RESEARCH METHODOLOGY

Quantitative research approach was adopted for this study whereby data were gathered through the use of questionnaires and oral interviews. For the purpose of

this paper, the ten districts in FCT, Abuja as registered by the Abuja Municipal Area Council (AMAC) were randomly sampled. The randomly selected six districts were Wuse, Maitama, Utako, Jabi, Kubwa and Karu. The construction operatives in the selected districts were also sampled and the sample frame consists of Project/Site Manager; Architects; Quantity Surveyors; Civil/Structural Engineers; Safety Officer; Foremen; Masons; Carpenters; Iron Benders; Painters; Administrative Officers; Store Keepers; Assistant Store Keepers; Logistics Officers; and Unskilled Workers.

The main analysis of data was carried out using descriptive statistics which include percentage, frequency counts, Mean Item Score (MIS) and Standard Deviation (St.Dev.). Frequency counts and percentage were used to analyse respondents' profile and data collected from the site observation undertaken. MIS was used to rank perception of respondents on the questionnaire data collected, while St.Dev. was used to determine the diffrence or variance in the opinion of respondents on the questionnaire data collected.

Table 1.0. Frequency and Percentage of Respondents' Profile

Category/Designation of Respondents	Frequency	Percentage (%)
Administrative Officers	1	2
Architects	5	9
Assistant Store Keepers	1	2
Carpenters	5	9
Civil/Structural Engineers	5	9
Foreman	5	9
Iron Benders	5	9
Logistics Officers	1	2
Masons	5	9
Painters	3	5
Project/Site Managers	5	9
Quantity Surveyors	5	9
Safety Officers	5	9
Unskilled Workers	4	7
Total	**55**	***100***
Respondents' Years of Experience		
1 - 5 Years	36	65
6 - 10 Years	15	27
11 - 15 Years	4	7
Total	**55**	***100***
Respondent's Involved in Construction Site Safety Management Practices		
Fully	32	58
Partially	18	33
Not at all	5	9
Total	55	100

Source: Researcher fieldwork (2025)

Respondents' perception on the causes of construction accidents

The results of the ranking of the identified causes of construction accidents based on the perception of respondents using MIS and St.Dev are presented and discussed in this section. The causes of accidents with the highest frequency of occurrence were "Lack of supervision by the supervisor in charge" (MIS = 3.85; St.Dev. = 0.16), "Lack of safety and health training" (MIS =3.76; St.Dev. = 0.12), and "Level of education and experience" (MIS = 3.55; St.Dev. = 0.05). The causes of accidents with the least frequency of occurrence were "Lack of regular inspection for material and machinery" (MIS = 3.11; St.Dev. = 0.20), "Lack of regular inspection for material and machinery" (MIS =3.05; St.Dev. = 0.26), and "Site conditions" (MIS = 3.55; St.Dev. = 0.05). On the average, all the causes of accidents identified on construction sites in Abuja occur very often (average MIS = 3.42). It was also revealed that the perceptions of the respondents on the causes of accidents identified on construction sites in Abuja do not differ significantly.

Table 2.0 Causes of Accidents on Construction sites

Code No.	Causes of Accidents on Construction Sites	MIS	St.Dev.	Rank	Decision
B3	Lack of supervision by the supervisor in charge	3.85	0.16	1st	Very Often
B8	Lack of safety and health training	3.76	0.12	2nd	Very Often
B6	Level of education and experience	3.55	0.05	3rd	Very Often
B5	Workers under influence of drugs and/or alcohol	3.53	0.04	4th	Very Often
B9	Lack of safety culture	3.51	0.03	5th	Very Often
B15	Lack of regulatory compliance	3.45	0.01	6th	Very Often
B1	Lack of personal protective equipment (PPE)	3.44	0.06	7th	Very Often
B4	Attitudes of the workers	3.44	0.08	8th	Very Often
B11	Lack of accident records and official safety data	3.44	0.10	9th	Very Often
B2	Lack of communication between managers and workers	3.42	0.12	10th	Very Often
B12	Lack of safe working procedure	3.31	0.10	11th	Very Often
B10	Excessive overtime work	3.25	0.14	12th	Very Often
B7	Lack of safety meeting or toolbox meeting	3.20	0.16	13th	Very Often
B13	Lack of regular inspection for material and machinery	3.11	0.20	14th	Very Often
B14	Site conditions	3.05	0.26	15th	Very Often
	Average MIS	***3.42***			***Very Often***

Source: Researcher's fieldwork (2025)

Site experience on the causes of construction accidents

The results of the causes of construction site accidents assessed based on site experience from site observation undertaken in this study are presented in Table 3.0.

It can be noticed that most of the accidents recorded on construction sites, based on site experience, was "Negligence". This represents 45% of the total number of accidents that occurred. This was followed by accidents due to "Faulty Equipment", which represents 34% of the total number of accidents that occurred. On the other hand, 18% of the total number of accidents that occurred were due to "Wage Disparity", while the least number of accidents recorded was due to "Electric Shock" representing only 3% of the total number of accidents that occurred.

Table 3.0. Frequency of Causes of Accidents

Causes of Accidents	Frequency	Percentage (%)
Negligence	163	45
Faulty Equipment	121	34
Electric Shock	12	3
Wage Disparity	63	18
Total	***359***	***100***

Source: Researcher's Analysis (2025)

Rate of Prevention of Accidents on Construction Sites

The rate of prevention of accidents on construction sites has been addressed in two ways. Firstly, the use of MIS was adopted to rank the perception of respondents on the rate of prevention of accidents based on authors' perception from the review literature undertaken in this study. Secondly, the record taken from site observation on the rate of prevention of accidents on construction sites was analysed with the use of percentage.

Respondents' perception on the rate of prevention of accidents

The results of the MIS and St.Dev. ranking of the perception of respondents on the rate of prevention of accidents are presented in Table 4.0. These results indicate that the perceptions of the authors in which the respondents agree with the most were "Seventy-five percent (75%) of workers do not obey the rules in Nigeria" (MIS = 4.24; St.Dev. = 0.33) and "The specifics of accident prevention plans differ based on the business's size, type, and location" (MIS = 3.56; St.Dev. = 0.06). The perceptions of the authors in which the respondents agree with the least were "The rate at which the accident preventive measures are implemented on construction site is low due to poor safety behaviour" (MIS = 3.40; St.Dev. = 0.15) and "One out of every five deaths were caused by accidents on construction sites" (MIS = 3.25; St.Dev. = 0.21). On the average, all the respondents agree with the perceptions of authors on the rate of prevention of accidents in Abuja (average MIS = 3.55). The results also indicate that the opinions of the respondents on the rate of prevention of accidents in Abuja do not

vary significantly. This is because most of the values of the St.Dev. observed closely ranged from 0.06 – 0.21.

Table 4.0 Rate of Prevention of Accidents on Construction sites

Code No.	Rate of Prevention of Accidents on Construction Sites	MIS	St.Dev.	Rank	Decision
D2	Seventy-five percent (75%) of workers do not obey the rules in Nigeria	4.24	0.33	1st	Strongly Agree
D4	The specifics of accident prevention plans differ based on the business's size, type, and location	3.56	0.06	2nd	Agree
D5	Construction firms have poor accidents record all over the world	3.49	0.10	3rd	Agree
D3	Designers provide the best design to lower the accident rate in the construction industry based on known causes of accidents	3.49	0.11	4th	Agree
D7	Construction industry still experiences higher rates of accidents compared to other industries in spite of the gradual decrease in the number of occupational incidents	3.44	0.12	5th	Agree
D1	The rate at which the accident preventive measures are implemented on construction site is low due to poor safety behaviour	3.40	0.15	6th	Agree
D6	One out of every five deaths were caused by accidents on construction sites	3.25	0.21	7th	Agree
	Average MIS	***3.55***			***Agree***

Source: Researcher's Analysis (2025)

Employee's contribution to site accidents

The results of the MIS and St.Dev. ranking of the opinion of respondents on the contributions of employees to construction site accidents are highlighted in Table 5.0. The results presented in Table 5.0 indicates that the most severe contributions of employees to construction site accidents were "Misunderstanding between working trades" (MIS = 3.42; St.Dev. = 0.11) and "Inadequate housekeeping" (MIS = 3.27; St.Dev. = 0.14). The least severe contributions of employees to construction site accidents were "Lack of understanding and realizing of risk" (MIS = 3.15; St.Dev. = 0.20) and "Wrong safety attitude" (MIS = 2.91; St.Dev. = 0.25). On the average, all the contributions of employees to construction site accidents in Abuja were very severe (average MIS = 3.18). It was also revealed that the perceptions of the respondents on the contributions of employees to construction site accidents in Abuja do not differ

significantly. This is because most of the values of the St.Dev. observed closely ranged from 0.11 – 0.20.

Table 5.0 Employee's Contribution to Construction Site Accidents

Code No.	Employee's Contributions to Construction Site Accidents	MIS	St.Dev.	Rank	Decision
C1.6	Misunderstanding between working trades	3.42	0.11	1st	Very Severe
C1.3	Inadequate housekeeping	3.27	0.14	2nd	Very Severe
C1.5	Lack of compliance to safety rules and the working procedures	3.22	0.12	3rd	Very Severe
C1.1	Failure to use PPE	3.15	0.13	4th	Very Severe
C1.4	Lack of understanding and realizing of risk	3.15	0.20	5th	Very Severe
C1.2	Wrong safety attitude	2.91	0.25	6th	Severe
	Average MIS	***3.18***			***Very Severe***

Source: Researcher's Analysis (2025)

Employer's contribution to site accidents

The results of the MIS and St.Dev. ranking of the opinion of respondents on the contributions of employers to construction site accidents are highlighted in Table 6.0. The most severe contributions of employers to construction site accidents were "In the processes for the awarding construction contracts, safety factors are not given priority" (MIS = 3.40; St.Dev. = 0.05) and "Construction workers are frequently changing; hence, control of working conditions is difficult" (MIS = 3.40; St.Dev. = 0.07). The least severe contributions of employers to construction site accidents were "Safety is not considered in building construction project delivery processes" (MIS = 3.04; St.Dev. = 0.10) and "Different personnel work in stages" (MIS = 3.04; St.Dev. = 0.13). On the average, all the contributions of employers to construction site accidents in Abuja were very severe (average MIS = 3.22). It was also revealed that the perceptions of the respondents on the contributions of employees to construction site accidents in Abuja do not differ significantly. This is because most of the values of the St.Dev. observed closely ranged from 0.05 – 0.10.

Table 6.0: Employer's Contributions to Construction Site Accidents

Code No.	Employer's Contributions to Construction Site Accidents	MIS	St.Dev.	Rank	Decision
C2.8	In the processes for the awarding construction contracts, safety factors are not given priority	3.40	0.05	2nd	Very Severe
C2.12	Construction workers are frequently changing; hence, control of working conditions is difficult	3.40	0.07	3rd	Very Severe
C2.6	Lack of proper instructions	3.33	0.07	4th	Very Severe
C2.10	Neglect and inadequate health and safety education	3.33	0.09	5th	Very Severe

Code No.	Employer's Contributions to Construction Site Accidents	MIS	St.Dev.	Rank	Decision
C2.2	Lack of technology knowledge	3.27	0.07	6th	Very Severe
C2.9	Most accidents and injuries are not often reported and at many sites	3.20	0.06	7th	Very Severe
C2.3	Improper equipment and working platform	3.16	0.05	8th	Very Severe
C2.4	Sub-contractors usually have poor safety awareness at the construction site	3.11	0.07	9th	Very Severe
C2.5	Poor coordination	3.11	0.09	10th	Very Severe
C2.7	Safety is not considered in building construction project delivery processes	3.04	0.10	11th	Very Severe
C2.11	Different personnel work in stages	3.04	0.13	12th	Very Severe
	Average MIS	***3.22***			***Very Severe***

Source: Researcher's Analysis (2025)

DISCUSSION

In line with the findings of this study, past studies revealed that workers have little or no adequate safety knowledge and proper and good safety behaviours and positive attitudes toward safety (Adeagbo *et al*., 2019; Onibhagere, 2020). These deficiencies always lead to non-compliance with safety guidelines and regulations at a worksite. Therefore, employees' behaviours and attitudes towards safety can significantly impact accident rates (Olawale and Akinola, 2023). Majority of construction sites workers do not obey safety rules as indicated from the analyses.

CONCLUSION

This paper therefore concluded that among the causes of accidents identified, lack of supervision by the supervisor in charge (MIS = 3.85; St.Dev. = 0.16), lack of safety and health training" (MIS =3.76; St.Dev. = 0.12), and level of education and experience" (MIS = 3.55; St.Dev. = 0.05) were of highest frequency. On the average, all the causes of accidents identified on construction sites in Abuja occur very often (average MIS = 3.42). In addition, the most severe contributions of employees to construction site accidents were misunderstanding between working trades" (MIS = 3.42; St.Dev. = 0.11) and inadequate housekeeping" (MIS = 3.27; St.Dev. = 0.14) rank high among the employees' contributions. On the average, all the contributions of employees to construction site accidents in Abuja were very severe (average MIS = 3.18).

The most severe contributions of employers to construction site accidents were "In the processes for the awarding construction contracts, safety factors are not given priority" (MIS = 3.40; St.Dev. = 0.05) and "Construction workers are frequently

changing; hence, control of working conditions is difficult" (MIS = 3.40; St.Dev. = 0.07). On the average, all the contributions of employers to construction site accidents in Abuja were very severe (average MIS = 3.22).

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