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Article

Examining the Challenges in Implementing Occupational Health and Safety in the Selected Construction Companies Across Nigerian Coastal Cities

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ABSTRACT

Occupational Health and Safety Management (OHSM) is critical in construction due to the sector's high-risk nature. In Nigeria's coastal cities, however, safety practices remain undermined by behavioural, institutional, and systemic challenges. This study investigates the key barriers affecting OHSM implementation. A cross-sectional mixed-methods design was employed. Quantitative data were collected using structured questionnaires administered to 1,400 construction workers across Lagos, Rivers, Delta, and Cross River States. Quantitative analyses were conducted with SPSS 28 using descriptive statistics, mean ranking, and Chi-square tests. Qualitative data were obtained through 35 key informant interviews with senior site managers and were analysed thematically with QDA Miner. Workers' resistance emerged as the most significant challenge (mean = 3.98), followed by corruption and bribery (mean = 3.41), poor health and safety culture (mean = 3.39), and political influence (mean = 3.38). Overall, 58.5% of respondents reported moderate OHSM challenges, while 40.4% reported low challenges. Significant differences were observed between indigenous and international companies ($\chi^2 = 65.210$, $p < 0.001$) and across states ($\chi^2 = 217.92$, $p < 0.001$). Qualitative findings corroborated the quantitative results, highlighting worker non-compliance, budgetary constraints, logistical delays in PPE supply, low educational levels, and systemic governance challenges. The study highlights that behavioural non-compliance and systemic governance weaknesses, rather than resource constraints, are the primary drivers of OHSM outcomes. Interventions should prioritize continuous worker sensitization, stricter safety enforcement, effective resource planning, and enhanced government commitment to improve health and safety outcomes.

KEYWORDS

OHSM, Construction industry, Coastal cities, Worker resistance, Management challenges, and Nigeria.



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1. Introduction

The construction industry globally has a significant impact on economies, contributing to GDP growth and employment. However, this sector is also associated with a high incidence of OHS hazards, leading to adverse health, economic, and social consequences. The International Labour Organization (ILO) estimates that approximately 2.3 million deaths annually are attributed to work-related reasons, with 2 million linked to occupational diseases and 300,000 to occupational injuries. Furthermore, the economic costs of work-related injuries and illnesses are estimated to range from 1.8% to 6% of GDP, with the average being 4% (Takala et al., 2014) trends, and recent solutions and strategies to tackle major global and country problems in safety and health at work. The article is based on the Yant Award Lecture of the American Industrial Hygiene Association (AIHA). In developing countries, such as Nigeria, the situation is even more dire due to weak regulatory frameworks, poor implementation of health and safety programs, and reliance on manual labour in construction projects (Umeokafor & Isaac, 2016).

African countries face similar challenges, experiencing high rates of occupational hazards in the construction sector, a situation that also applies to construction companies operating in Nigeria's coastal cities. A study focusing on Nigeria and South Africa highlighted the significant risks to workers' psychosocial health, compounded by evolving work environments, economic competition, and technological advancements (Plessis, 2017). Specifically, in Nigeria, research reveals a high occurrence of occupational accidents, injuries, and deaths in construction, significantly higher than global standards (Eigege *et al.*, 2021) the level of enforcement by the statutory authority in Nigeria is very low. Hence, the need for active means of implementation of H&S practices in Nigerian construction. Therefore, this paper investigated the barriers and movers of effective implementation of H&S management practices in construction site in Abuja the Federal Capital City of Nigeria where there were several ongoing projects during the study. Structured questionnaire and review of relevant literatures were used to obtain data for the study. Importance index was the major statistical tools used in analysis of the data obtained. The study identified absence of provision for cost of H&S practices in the bill of quantities, lack of record of performance as prerequisite for tender selection, inadequate training of staff and clients influence as the most important factors inhibiting effective implementation of H&S practices in Nigerian construction site.", "author": [{"dropping-particle": "", "family": "Eigege", "given": "", "non-dropping-particle": "", "parse-names": false, "suffix": ""}, {"dropping-particle": "", "family": "Aka", "given": "", "non-dropping-particle": "", "parse-names": false, "suffix": ""}, {"dropping-particle": "", "family": "A.", "given": "", "non-dropping-particle": "", "parse-names": false, "suffix": ""}, {"dropping-particle": "", "family": "Agbo", "given": "", "non-dropping-particle": "", "parse-names": false, "suffix": ""}, {"dropping-particle": "", "family": "A.E.", "given": "", "non-dropping-particle": "", "parse-names": false, "suffix": ""}], "container-title": "SETIC 2020 International Conference: \\Sustainable Housing and Land Management\\", "id": "ITEM-1", "issue": "May", "issued": {"date-parts": [{"2021"}]}, "page": "266-271", "title": "Effective Implementation of Health and Safety Practices on Construction Site: Barriers and Movers", "type": "article-journal", "uris": [{"http://www.mendeley.com/documents/?uuid=12a53068-59f7-49df-a712-45311eb1bc72"}], "mendeley": {"formattedCitation": "(Eigege et al., 2021).

In Nigeria's coastal region, the construction industry plays a crucial role in economic development, with several high-profile projects aimed at enhancing infrastructure and connectivity. However, these projects face substantial setbacks due to inadequate Occupational Health and Safety Management (OHSM) practices. Commonly, workers in this region are exposed to various risks, including falls from heights, hazardous materials, and dangerous machinery operations (Okolie & Okoye, 2012; Umeokafor *et al.*, 2015). Despite OHS regulations, their practical implementation is limited, leading to frequent accidents and health issues among construction workers (Idoro, 2011).

Nationally, the burden of inadequate OHS management in the Nigerian construction sector is multifaceted, affecting health, the economy, society, and occupational safety. The financial burden is evident in project delays, increased costs, absenteeism, low productivity, and overall poor project

performance (Tunji-Olayeni, Afolabi, Olowookere, Okpalamoka, & Oluwatobi, 2019)Nigeria. Data obtained through the survey were evaluated by means of frequencies and charts. The study showed that majority of the craftsmen surveyed suffered one form of health challenge or the other. Occupational hazards drain the resources of workers. It also leads to absenteeism, low productivity and poor project performance. On a national scale, occupational hazards increase disease burden which is an additional cost to government spending on health care. The findings have negative implications on the attainment of goals 1 (no poverty. Workers in Nigeria's construction industry frequently suffer from injuries due to the lack of personal protective equipment (PPE), technical guidance, and adequate safety training (Isah, 2019; Abina *et al.*, 2024)Parties involve (including government agencies. Inadequate government enforcement, the absence of OHS-specific legislation, and low awareness among stakeholders have further contributed to the neglect of health and safety practices (Isah, 2019)Parties involve (including government agencies.

The social burden includes the loss of lives and property due to construction accidents. The frequent occurrence of accidents on construction sites has necessitated immediate measures to improve workplace safety (Manu *et al.*, 2019). There is also an occupational burden, as the health and safety of construction workers are critical to completing projects efficiently. Poor implementation of OHS management results in a less motivated workforce. Many workers suffer injuries due to inadequate personal protective equipment (PPE), insufficient technical guidance, and a lack of comprehensive safety training (Isah, 2019; Abina *et al.*, 2024)Parties involve (including government agencies. Studies have shown that while workers understand the importance of PPE, its availability, maintenance, and user-friendliness are often lacking. Additionally, the implementation of safety regulations and the conduct of frequent site inspections by government agencies are crucial to improving safety standards (Isah, 2019)Parties involve (including government agencies. Efforts to address these issues include developing and enforcing building codes, providing regular safety training, and ensuring the availability and proper use of PPE (Abina *et al.*, 2024)Parties involve (including government agencies.

Nigeria's coastal cities are undergoing several high-profile construction projects aimed at boosting economic growth, enhancing connectivity, and improving infrastructure. Some of the notable projects include Lagos-Calabar Coastal Highway, a 700-kilometre road linking Lagos and Calabar, traversing key cities along the coastline; Eko Atlantic City, a massive land reclamation project designed to create a new financial hub for West Africa; Lagos Rail Mass Transit (LRMT), an ambitious urban rail project aimed at easing traffic congestion and providing efficient public transportation and Lekki Deep Sea Port, an advanced port infrastructure project to support increased maritime trade. In Port Harcourt and Warri, projects such as the Trans-Kalabari Road, the Bodo-Bonny Road Project, the Port Harcourt Industrial and Commercial Hub, and the Warri Seaport Rehabilitation are underway to enhance connectivity and industrial capabilities. Calabar's major projects, such as the Calabar Deep Sea Port and Calabar International Convention Centre, aim to boost maritime trade and tourism. Given the scale and complexity of these construction projects, the effectiveness of Occupational Health and Safety Management (OHSM) in Nigeria's coastal cities is paramount (Dodo, 2014)one quarter of them hardly comply with any Health and Safety Plan during construction. Furthermore, employees are assets but this study reveals that some firms fully in business neither have Health and Safety insurance for their employees nor do some facilitate payment of Health and Safety insurance for their staff. It was concluded that effective Health and Safety practices for employees in Nigeria are yet to be fully appreciated and implemented among construction firms. As such, it is recommended that relevant authorities should checkmate Health and Safety practices in the Nigerian construction industry. © 2014 JUST. All Rights Reserved.", "author": [{"dropping-particle": "", "family": "Dodo", "given": "Mansir", "non-dropping-particle": "", "parse-names": false, "suffix": ""}], "container-title": "Jordan Journal of Civil Engineering", "id": "ITEM-1", "issue": "1", "issued": {"date-parts": [{"2014"}]}, "page": "81-87", "title": "The application of health and safety plan in Nigerian construction firms", "type": "article-journal", "volume": "8"}, "uris": [{"http://www.mendeley.com/documents/?uuid=d2912a3f-06fc-40dd-b602-b9f5a72d66ea"}]}, "mendeley": {"formattedCitation": "(Dodo, 2014. The construction industry is inherently hazardous, with workers exposed to risks such as accidents, injuries, and health hazards. Effective OHSM practices are essential to mitigate these risks, ensuring the safety and well-being of workers and maintaining project timelines and budgets. The problem lies in understanding the extent to which OHS management systems are implemented and effective

in Nigeria's coastal cities' construction companies. This research examines the challenges in implementing OHSM in the selected construction companies in the Nigerian coastal cities

2. Methodology

2.1. Research Design

This study adopted a mixed-method research design, combining quantitative and qualitative approaches to provide a comprehensive understanding of the challenges in implementing OHSM in construction companies across Nigeria's coastal cities. The quantitative component used structured survey data to measure the prevalence, ranking, and statistical significance of OHSM challenges. In contrast, the qualitative component sought deeper insights from senior managers through interviews to contextualize the numerical findings. This design was chosen to strengthen the reliability of the results through triangulation and to capture both measurable and experiential aspects of OHSM implementation.

2.2. Study Area and Population

The study was conducted in five coastal states in Nigeria: Lagos, Rivers, Bayelsa, Delta, and Cross-River, which host major indigenous and international construction companies. The study population included the construction workers currently employed at the selected active sites and senior managers responsible for implementing OHSM policies. This population was selected due to its direct involvement in workplace operations and OHSM practices.

2.3. Sampling Technique and Sample Size

A multistage sampling technique was used. In the first stage, construction companies were stratified into indigenous and international firms. In the second stage, purposive sampling identified major ongoing projects within the selected states. Finally, proportionate random sampling was employed to select workers from each site.

Using the Cochran formula $N = Z^2pq/d^2$

Where: N= minimum sample size required; Z= standard deviation with 95% confidence intervals (1.96 z value); P= 50% expected proportion used in a similar study (Idoko *et al.*, 2023). Q= 1-p; D= acceptable error margin of 5 % (0.05).

N=385

To strengthen statistical power, address potential non-response, and allow for subgroup analyses (such as by state, company type, gender, and years of experience), the sample size was expanded to 1,400 respondents, representing the total data collected. This adjustment improved the robustness and reliability of the findings.

In addition, 35 key informant interviews were conducted with senior managers to gain qualitative insights. The sample size ensured sufficient statistical power for inferential analysis and thematic saturation in the qualitative component.

2.4. Data Collection Methods

2.4.1. Quantitative Data

Quantitative data were collected using a structured questionnaire designed to capture information on 14 key OHSM implementation variables, including availability of resources, workers' resist-

ance, adequacy of training, vector-borne exposure, preventive measures, health screenings, emergency response, corruption and bribery, political influence, and government commitment. Responses were measured using a five-point Likert scale (e.g., Excellent to Very Poor, Very High to Very Low), enabling comparison and ranking of challenges. The structured questionnaire was developed based on an extensive review of published Occupational Health and Safety Management (OHSM) instruments and empirical studies conducted in construction and industrial settings in Nigeria and other developing contexts (e.g., Idoro, 2011; Umeokafor et al., 2014; Isah, 2019). Items were adapted to reflect the Nigerian coastal construction environment and refined through expert review by occupational health and safety professionals and academics. A pilot test was conducted to assess clarity and relevance, and minor wording adjustments were made before final deployment. The questionnaire measured 14 OHSM implementation variables, including availability of resources, workers' resistance, adequacy of training, vector-borne exposure, preventive measures, routine health checks, emergency response protocols, medical assistance speed, telemedicine/communication access, corruption and bribery, poor health and safety culture, political influence, lack of skilled staff, and inadequate government commitment.

2.4.2. Qualitative Data

Qualitative data were obtained through semi-structured interviews with senior managers. This approach provided context to the quantitative results by uncovering behavioural, managerial, and systemic perspectives. This study is guided by a simple conceptual framework that explains OHSM implementation as the outcome of interactions among behavioural, organizational, and governance factors. Behavioural factors include workers' attitudes, compliance, and risk perceptions. Organizational factors relate to the availability of resources, training, safety systems, and emergency preparedness. Governance factors encompass regulatory enforcement, political influence, and institutional accountability. Weaknesses in any of these domains can undermine effective OHSM implementation, while their alignment strengthens safety outcomes. This framework informed the selection of study variables and guided the interpretation of the quantitative and qualitative findings.

Reliability and Validity

The reliability of the survey instrument was assessed using Cronbach's Alpha, which yielded acceptable internal consistency across variables (>0.70). Validity was ensured through expert review of the questionnaire and pre-testing in a pilot study. Triangulation of quantitative and qualitative findings further enhanced the study's credibility and trustworthiness.

Data Analysis

All statistical analyses were conducted using SPSS version 28. Descriptive statistics were summarized using frequencies, percentages, means, and standard deviations. Inferential analyses were performed using Chi-square (χ^2) tests of independence to examine associations between categorical variables, including company type, state, and levels of OHSM implementation challenges.

Chi-square results are consistently reported, including the test statistic (χ^2), degrees of freedom (df), sample size (N), and exact p-values. Where statistically significant associations were identified ($p < 0.05$), effect sizes were calculated using Cramér's V to indicate the strength of associations, interpreted as small (≈ 0.10), moderate (≈ 0.30), or large (≈ 0.50). All statements of statistical significance in the Results section were cross-checked to ensure complete consistency with the reported statistical outputs.

Qualitative data from key informant interviews were analysed using thematic analysis. Interview transcripts were first read repeatedly for familiarisation, after which initial codes were independently generated by two researchers using QDA Miner. Codes were compared, discussed, and refined to ensure consistency, and disagreements were resolved through consensus. Related codes were then grouped into categories and developed into final themes based on recurrence, relevance to OHSM implementation, and alignment with study objectives. To enhance credibility, peer debriefing and

coder cross-checking were employed, and themes were reviewed against the original transcripts to ensure accurate representation of participants' perspectives.

Triangulation was achieved by systematically comparing qualitative themes with quantitative results. Qualitative findings were used to explain, contextualize, and validate statistical patterns observed in the survey data, particularly regarding worker resistance, resource constraints, and governance-related challenges. This integrative approach strengthened the robustness and interpretability of the study findings.

Ethical Considerations

Ethical approval was obtained from the University of Port Harcourt through the research ethics committee office. Informed consent was obtained from all participants prior to data collection, and anonymized responses maintained confidentiality. Participation was voluntary, and respondents were assured that their data would be used solely for academic purposes.

3. Result

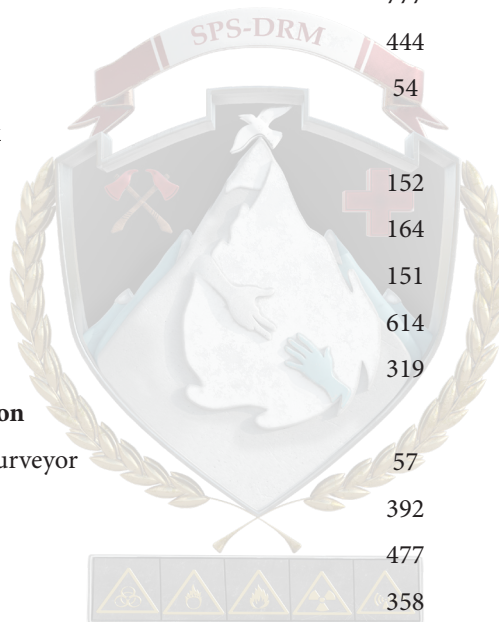
3.1. Sociodemographic characteristics of construction workers in Nigeria's coastal cities

Table 1 presents the sociodemographic profile of respondents employed in different construction companies across coastal sites in Nigeria. The distribution shows that the most significant proportion of respondents was from the Eko Atlantic City project (18.9%), followed by the Lagos-Calabar Coastal Highway (14.7%) and the Bodo-Bonny Road project (14.3%). In terms of age, over half of the participants were between 36 and 45 years (54.2%), while 37.0% were aged 26–35. The workforce was overwhelmingly male (96.8%), with women representing only 3.2%. Educationally, the majority held a Diploma (52.5%), while 35.6% had a bachelor's degree and 7.4% had completed secondary school. Regarding work experience, most respondents had 1–5 years of experience (55.4%), followed by 31.8% with 6–10 years, and only 3.9% had more than 11 years. Geographically, most participants were based in Lagos State (43.9%), Rivers State (22.8%), and Cross River State (11.7%). For professional affiliations, 7.5% were members of COREN, 6.2% were members of ISPON, and 4.0% were registered with IOSH. In terms of staff categorization, Labourers accounted for 53.6%, while Professionals made up 46.4% of the sample.

Table 1. Sociodemographic characteristics of construction workers in Nigeria's coastal cities.

Variable	Frequency (n=1400)	Percentage (%)
Project		
Bodo-Bonny Road	200	14.3
Calabar Deep Sea Port	164	11.7
Eko Atlantic city	264	18.9
Glory Drive Road construction	152	10.9
Lagos Rail Mail Transit	144	10.3
Lagos-Calabar Coastal Highway	206	14.7
Port Harcourt Trans- Kalabari Road	119	8.5
Rehabilitation of Warri Seaport	151	10.8
Age Category		
18-25	48	3.4
26-35	518	37.0

36-45	759	54.2
46-55	70	5.0
56 and above	5	0.4
Gender		
Male	1355	96.8
Female	45	3.2
Highest Educational qualification		
Secondary school	104	7.4
Diploma	735	52.5
Bachelor's degree	498	35.6
Postgraduate	63	4.5
Years of Experience in the Construction Industry		
Less than 1 year	125	8.9
1-5 years	777	55.5
6-10 years	444	31.7
11-years and above	54	3.9
State of current work		
Bayelsa	152	10.9
Cross River	164	11.7
Delta	151	10.8
Lagos	614	43.9
Rivers	319	22.8
Professional Affiliation		
Architect/ Quantity Surveyor	57	4.1
Builder	392	28.0
Construction	477	34.1
Engineer	358	25.6
Health and Safety	116	8.3
Registration Body		
ARCON	26	1.9
COREN	105	7.5
IOSH	56	4.0
ISPON	86	6.1
QSRBN	7	0.5
None	1120	80.0
Staff Class		
Labourers	751	53.6
Professionals	649	46.4



OHSM Implementation Challenges in Nigeria's Coastal Cities' Construction Companies

Table 2 summarises the challenges in implementing OHSM in construction companies in Nigeria's coastal cities across 14 variables. Availability of resources is rated "Good" by 51.1% (716) and "Fair" by 41.1% (575), with minimal responses of "Poor" (1.9%) or "Very Poor" (0.4%). Workers' resistance is predominantly "Moderate" (66.3% or 928), with "Very High" at 9.1% (127). Adequacy of training is strong, with 53.1% (743) rating it "Excellent" and 37.5% (525) "Good." Vector-borne exposure is mostly "Minimal" (66.6% or 932) or "No exposure" (20.6% or 289). Preventive measures are "Some" for 65.3% (914) and "Adequate" for 25.4% (355). Health checks are often "Planned but not yet implemented" (45.6% or 639) or "Regularly" (28.2% or 395). Emergency response protocols are "Some protocols, not effective" for 59.8% (837), with "Adequate" at 23.1% (323). Medical assistance speed is split, with 34.0% (476) within 30 minutes and 33.2% (465) several hours. Telemedicine/communication is "Communication system in place, no telemedicine" for 56.8% (795). Corruption and bribery, poor health and safety (H&S) culture, and political influence are mostly rated as "Low" (40.4%, 39.8%, 38.4%) or "High" (37.2%, 39.6%, 39.2%). Lack of skilled staff and inadequate government commitment are predominantly "Low" (60.6% and 61.1%), with minimal "Very High" responses.

Table 2. Assessment of Key Variables Influencing Occupational Health and Safety Management (OHSM) in Nigeria's Coastal Construction Sector

Variable	Option 1	Option 2	Option 3	Option 4	Option 5
Availability of resources	Fair 575 (41.1)	Good 716 (51.1)	Poor 27 (1.9)	Excellent 76 (5.4)	Very Poor 6 (0.4)
Workers' resistance	Moderate 928 (66.3)	Very High 127 (9.1)	High 308 (22.0)	Low 31 (2.2)	Very low 6 (0.4)
Adequacy of training	Good 525 (37.5)	Excellent 743 (53.1)	Fair 103 (7.4)	Poor 26 (1.9)	Very Poor 3 (0.2)
Vector-borne exposure	Minimal exposure 932 (66.6)	No exposure 289 (20.6)	Medium exposure 118 (8.4)	Exposed 58 (4.1)	Highly exposed 3 (0.2)
Preventive measures	Minimal measures 76 (5.4)	Some Measures 914 (65.3)	Adequate Measure 355 (25.4)	Inadequate Measures 43 (3.1)	No measures needed 12 (0.9)
Health checks/screenings	Planned but not yet implemented 639 (45.6)	Rarely 169 (12.1)	Occasionally 190 (13.6)	Regularly 395 (28.2)	Not conducted 7 (0.5)
Emergency response protocols	Minimal protocols, significant delays 86 (6.1)	Some protocols are not effective 837 (59.8)	Comprehensive protocols in Place 142 (10.1)	Adequate protocols, limited resources 323 (23.1)	No emergency protocols 12 (0.9)
Medical assistance speed	Several hours delay 465 (33.2)	Within 30 Minutes 476 (34.0)	Within 1 hour 425 (30.4)	Immediate Response 21 (1.5)	No assistance available 13 (0.9)
Telemedicine/communication	Planned but not available yet 392 (28.0)	Communication system in place, no telemedicine 795 (56.8)	Limited or Inconsistent access 176 (12.6)	No telemedicine or communication systems 17 (1.2)	Fully available and functional 20 (1.4)
Corruption and bribery	Moderate 255 (18.2)	High 521 (37.2)	Low 565 (40.4)	Very High 57 (4.1)	Very low 2 (0.1)
Poor H&S culture	Moderate 238 (17.0)	High 554 (39.6)	Low 557 (39.8)	Very High 44 (3.1)	Very low 7 (0.5)

Political influence	Moderate 265 (18.9)	High 549 (39.2)	Low 537 (38.4)	Very High 39 (2.8)	Very low 10 (0.7)
Lack of skilled staff	Moderate 272 (19.4)	High 228 (16.3)	Low 849 (60.6)	Very High 40 (2.9)	Very low 11 (0.8)
Inadequate govt commitment	Moderate 272 (19.4)	High 211 (15.1)	Low 855 (61.1)	Very High 47 (3.4)	Very low 15 (1.1)

Figure 1 illustrates the distribution of overall challenges facing the selected construction companies in Nigeria's coastal cities, based on the responses of 1,400 workers. The majority, 58.5% (819 workers), rate the challenges as "Moderate," indicating a significant but manageable level of difficulty. A substantial portion, 40.4% (566 workers), perceive the challenges as "Low," suggesting that many companies experience relatively fewer obstacles. Only 11.1% (15 workers) report the challenges as "High," reflecting a minority facing severe issues.

Overall Challenge Level Distribution

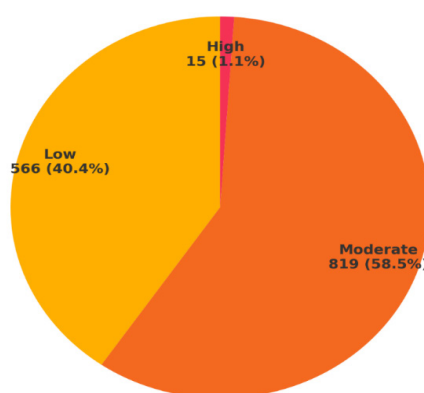


Figure 1. Distribution of Overall Challenges Facing the Selected Construction Companies in Nigeria's Coastal Cities.

Distribution of OHSM Implementation Challenges Across Company Types in Nigeria's Coastal Cities

Table 3 presents a significant association between company type and the level of the measured outcome ($\chi^2 = 65.210$, $p < 0.001$). Among indigenous companies, nearly half of respondents reported low levels (49.7%), a similar proportion reported moderate levels (50.1%), and almost none reported high levels (0.1%). In contrast, in international companies, a smaller proportion reported low levels (30.0%), the majority reported moderate levels (67.9%), and a small proportion reported high levels (2.1%).

Table 3. Comparative Analysis of Challenge Levels in Occupational Health and Safety Management (OHSM) Between Indigenous and International Construction Companies.

Company Type	Low n (%)	Moderate n (%)	High n (%)	Chi-Square p-value
Indigenous Company	368 (49.7)	371 (50.1)	1 (0.1)	65.210 <0.001*
International Company	198 (30.0)	448 (67.9)	14 (2.1)	

* Significant at $p < 0.001$

Distribution of OHSM Implementation Challenges Across States in Nigeria's Coastal Cities

Table 4 outlines the distribution of challenge levels in Occupational Health and Safety Management (OHSM) implementation across five states, indicating that most respondents experienced moderate challenges. Cross-River had the highest proportion reporting moderate challenges (88.4%), fol-

lowed by Delta (81.5%) and Rivers (57.4%). Bayelsa had 59.9% reporting moderate challenges, while Lagos had a more balanced distribution with 54.7% reporting low challenges and 45.1% moderate. High-level challenges were generally uncommon, with the highest in Cross-River (6.7%) and Bayelsa (2.0%). The differences in challenge levels across states were statistically significant ($\chi^2 = 217.92$, $p < 0.001$), suggesting variation in the effectiveness of OHSM implementation.

Table 4. Analysis of Challenge Levels in Occupational Health and Safety Management (OHSM) Implementation

State	Low n (%)	Moderate n (%)	High n (%)	Chi-Square p-value
Bayelsa	58 (38.2)	91 (59.9)	3 (2.0)	217.92 <0.001*
Cross-River	8 (4.9)	145 (88.4)	11 (6.7)	
Delta	28 (18.5)	123 (81.5)	0 (0.0)	
Lagos	336 (54.7)	277 (45.1)	1 (0.2)	
Rivers	136 (42.6)	183 (57.4)	0 (0.0)	

* Significant at $p < 0.005$

Table 5 indicates that the significant challenges to Occupational Health and Safety Management (OHSM) in Nigeria's coastal construction companies are workers' resistance (mean = 3.98), corruption and bribery (3.41), and poor health and safety culture among stakeholders (3.39). Other notable issues include political influence (3.38) and lack of skilled staff (3.13). Less critical challenges, with lower mean scores, include availability of resources (2.71) and adequacy of training (2.62), suggesting that organizational and behavioral factors are more significant barriers than material or technical constraints.

Table 5. Ranking of Challenges to Occupational Health and Safety Management (OHSM) Implementation in Nigeria's Coastal Construction Companies.

Rank	Challenge Variable	Mean (SD)
1	Workers' resistance	3.98 (0.65)
2	Corruption and bribery	3.41 (0.80)
3	Poor H&S culture among stakeholders	3.39 (0.79)
4	Political influence	3.38 (0.79)
5	Lack of skilled staff	3.13 (0.83)
6	Inadequate government commitment/intervention	3.12 (0.82)
7	Vector-borne disease exposure	3.09 (0.87)
8	Medical assistance speed	3.06 (0.82)
9	Emergency response protocols	3.00 (0.77)
10	Preventive measures (anti-malaria, etc.)	2.95 (0.72)
11	Routine health checks or screenings	2.91 (1.14)
12	Telemedicine/communication access	2.83 (0.87)
13	Availability of resources (funds, equipment)	2.71 (0.71)
14	Adequacy of training	2.62 (0.68)

Qualitative Result

Challenges to Health and Safety Implementation

Even with clear policies and strategic planning, organizations often face practical challenges that hinder the full implementation of health and safety (HSE) standards. In the construction industry, where risks are heightened and workforce dynamics are diverse, these challenges can stem from both organizational and human factors. This section explores the perceptions of senior managers and supervisory staff on the key barriers their organizations face in implementing HSE standards. Figure 2 below reveals five major themes: Non-compliance and Worker Attitude, Resource and Budget Constraints, PPE Supply and Logistical Delays, Educational and Cultural Barriers, and Systemic and Institutional Challenges.

Figure 2. Challenges to Health and Safety Implementation.

Theme 1: Non-compliance and Worker Attitude.

One of the most reported issues was workers' refusal or reluctance to follow safety rules. Several managers emphasized that despite the availability of PPE and clear instructions, many workers show resistance, carelessness, or outright defiance. This poses a serious risk to safety outcomes.

"Some staff do not comply with the use of PPE... some people need to be monitored or supervised... If you cannot comply, you leave."

— HSE Manager, Lagos Calabar Coastal Highway

"The staff are the challenges. They do not take instructions. You give somebody something to wear, tomorrow the person will tell you it is lost or spoiled."

— Project Admin, Port Harcourt Trans Kalabari Road

"Some of them, they have this adamant behaviour... they look at that safety equipment like, 'No, I cannot wear this.'"

— HSE Manager, Calabar Deep Sea Port

These responses reflect a behavioural barrier to safety enforcement and require continuous monitoring and disciplinary measures.

Theme 2: Resource and Budget Constraints

Many participants identified inadequate funding as a significant barrier to achieving full HSE compliance. Budget limitations can affect the procurement of PPE, training materials, and emergency-preparedness infrastructure.

"It is expensive to run. One of the things the management is facing is the cost... helmets, gloves, rain boots... all cost money."

— Site Engineer, Eko Atlantic City

"Sometimes, the budget could be our problem. Approval is not domiciled in NPA; it comes from the presidency... we are not able to meet up 100% of our proposals."

— Human Resource, Rehabilitation of Warri Port

"One of the challenges is the shortage in resources... especially when we have external visitors and no provision is made for them."

— HSE Manager, Calabar Deep Sea Port

Theme 3: PPE Supply and Logistical Delays

Even when funding is available, delays in procuring and delivering PPE can leave workers temporarily exposed to risk. These delays are often linked to supply chain inefficiencies or managerial bottlenecks.

"Sometimes it might take one or two days for our supplier to get them to the site... if these things are not there, it will affect the workers."

— HSE Manager, Lagos Rail Mass Transit

"Most of the resources brought to the site are counted only for workers... There is no provision for visitors."

— HSE Manager, Calabar Deep Sea Port

Such logistical challenges can undermine safety efforts, especially in fast-paced or high-risk project environments.

Theme 4: Educational and Cultural Barriers

Low levels of education and cultural beliefs were also cited as challenges, particularly in influencing workers to appreciate the importance of HSE practices.

"About 60% of the workers are used to drug taking... They take alcohol during the break. You cannot control their whereabouts."

— Personnel Manager, Lagos Rail Mass Transit

"Many labourers come from informal work settings... some workers refuse to wear PPE due to discomfort or cultural beliefs."

— Human Resource, Glory Drive, Airport Road to Imgbi Bayelsa

"The poor education of the workers... and keeping to procedures is a challenge."

— HSE Manager, Port Harcourt Trans Kalabari Road

These observations suggest that education and sensitization are crucial in achieving long-term compliance, especially among informal or unskilled labourers.

Theme 5: Systemic and Institutional Challenges

In some cases, broader institutional or structural issues were identified. These included delays in decision-making, limited authority at the local level, and the complex nature of safety regulations.

"Challenges are everywhere. Some are local, some within management, some are national... Approval of the budget is not domiciled in NPA."

— Human Resource, Rehabilitation of Warri Port

"Complex regulatory requirements and standards. Difficulty in changing employee behaviors. Managing risks from new technologies."

— Project Manager, Calabar Deep Sea Port

These structural challenges often go beyond the control of project-level management and may require systemic reforms and better coordination between regulatory bodies and executing agencies.

The findings reveal that challenges to implementing health and safety standards are multifaceted and context-specific. While organizations show a strong commitment to safety, they are often constrained by behavioural issues, budget limitations, supply chain delays, low educational levels among workers, and broader institutional hurdles. Addressing these challenges requires a combination of stricter enforcement, increased investment, better logistical planning, ongoing worker education, and supportive policy environments. Overcoming these barriers is essential for creating a safe and productive construction sector that protects both workers and organizational integrity.

4. Discussion

The study shows that over half (51.1%) of the workers rated resource availability as “Good,” and another 41.1% selected “Fair,” indicating that most construction companies have a reasonably stable foundation to support OHS operations. However, only 5.4% rated resource availability as “Excellent,” and 2.3% rated it “Poor” or “Very Poor,” showing that excellence in material and financial resource deployment is rare. This moderately positive finding suggests that while most firms are adequately resourced, there remains a gap between adequacy and excellence in critical areas such as safety equipment, signage, hazard control systems, and emergency preparedness. The results align with previous findings from Claris’s (2014) literature review, which noted that most workers lack access to the safety equipment and protective gear needed to carry out their jobs safely (Oke, Aliu, Akinpelu, Ilesanmi, & Alade, 2024) limited research has focused on the hindrances faced in implementing these principles in the context of developing countries. To address this research gap, this study examines these hindrances from the perspective of professionals in the Nigerian construction industry. Existing hindrances were extracted from extant studies using a systematic literature review with predefined inclusion/exclusion criteria which helped formulate the questionnaire. Through the application of exploratory factor analysis, five clusters of hindrance factors were identified, encompassing financial constraints, inadequate policies and regulations, insufficient technological infrastructure, lack of awareness and education and stakeholder-related challenges. Furthermore, the multinomial regression analysis confirmed that the hindrances related to financial constraints, inadequate policies and regulations and insufficient technological infrastructure are the most significant barriers. This study advances scientific knowledge on the hindrances to the adoption of EEPs in Nigerian building projects, providing a comprehensive understanding of the challenges faced in the context of the Nigerian construction industry. Findings from the study will inform policymakers, industry professionals and other stakeholders about the key challenges that require attention and intervention, facilitating the development of targeted strategies and initiatives to overcome these barriers effectively.”

author: [{"dropping-particle": "", "family": "Oke", "given": "Ayodeji Emmanuel", "non-dropping-particle": "", "parse-names": false, "suffix": ""}, {"dropping-particle": "", "family": "Aliu", "given": "John", "non-dropping-particle": "", "parse-names": false, "suffix": ""}, {"dropping-particle": "", "family": "Akinpelu", "given": "Taiwo Marcus", "non-dropping-particle": "", "parse-names": false, "suffix": ""}, {"dropping-particle": "", "family": "Ilesanmi", "given": "Oluwadamilare Olamide", "non-dropping-particle": "", "parse-names": false, "suffix": ""}, {"dropping-particle": "", "family": "Alade", "given": "Kehinde Temitope", "non-dropping-particle": "", "parse-names": false, "suffix": ""}], "container-title": "Energy and Built Environment", "id": "ITEM-1", "issued": {"date-parts": [{"2024"}]}, "title": "Breaking barriers: Unearthing the hindrances to embracing energy economics principles in Nigerian building projects", "type": "article-journal", "uris": [{"http://www.mendeley.com/documents/?uuid=f6ce8b19-d8e6-40fa-a92d-f1f-daac3c445"}], "mendeley": {"formattedCitation": "(Oke, Aliu, Akinpelu, Ilesanmi, & Alade, 2024). This lack of safety equipment and protective gear often results in injuries and accidents. The disparity between acceptable and optimal provision could also be driven by profit-centric operations, in which investment in safety is often seen as a regulatory compliance issue rather than a strategic priority. In contrast, training adequacy received strong ratings, with 53.1% of workers identifying it as “Excellent” and 37.5% as “Good,” making it one of the most positively rated variables in the study. This may reflect increasing awareness of the legal and reputational consequences of workplace injuries, as well as the influence of both national campaigns and donor-funded capacity-building programs in the sector. The emphasis on training might also stem from organizational efforts to offset weaknesses in enforcement with knowledge-based interventions (Jimoh, Oyewobi, Isa, & Momoh, 2017; Makinde, 2014; Okolie & Okoye, 2012) the causes of accidents and level of adherence to safety rules needed to be examined. Therefore, this research assessed the level of adherence to safety measures on construction sites in Abuja, Nigeria. A well-structured self-administered questionnaire survey of 140 selected firms was conducted in Abuja. Findings showed that the Personal Protective Equipment (PPE).

The analysis reveals that 66.3% of respondents described worker resistance to safety measures as “Moderate,” with another 31.1% rating it “High” or “Very High.” This highlights an ongoing

challenge in the sector, where safety compliance is often undermined by worker attitudes, informal work practices, and cultural norms that downplay risk (Olutuase, 2014) the need for an effective safety management system which aims at forestalling the risks and hazards inherent on site has been reiterated by recent studies and applicable laws. Studies however show that level of effectiveness differs from country to country; industry to industry and from company to company. This study therefore undertakes both qualitative and quantitative investigation into the safety management system of a Nigeria-based construction company with a view of determining how compliant the system is to international standards. Identifying five major components and fifteen elements in the study, both primary and secondary data were collected through personal interviews, structured questionnaire and observation and these were analysed using One Sample t-test at 0.05 level of significance. The results show that though a form safety management system exists in the company, the system is however poorly organised and consequently, it is characterised by ineffectiveness and poor documentation. It is therefore recommended that management gives an urgent attention to the company's safety management system with an intense interest to standardise its operations and functionality. As a roadmap to achieving this, the paper proposes an integrated \ " PCR \ " safety model based on the \ " TAB \ " philosophy."

,"author": [{"dropping-particle": "", "family": "Olutuase", "given": "Samuel Oladipo", "non-dropping-particle": "", "parse-names": false, "suffix": ""}], "container-title": "IOSR Journal of Business and Management", "id": "ITEM-1", "issue": "3", "issued": {"date-parts": [{"2014"}]}, "page": "01-10", "title": "A Study of Safety Management in the Nigerian Construction Industry", "type": "article-journal", "volume": "16", "uris": [{"http://www.mendeley.com/documents/?uuid=dda42b1d-2a15-486a-bdb7-1a2cdb910799"}], "mendeley": {"formattedCitation": "(Olutuase, 2014. According to Danso et al. (2024), low safety compliance in West African construction environments is partly driven by workers' perceptions of safety protocols as non-essential or disruptive to productivity. Many workers still engage in risky behaviours despite awareness of potential dangers, often relying on personal beliefs rather than safety protocols (Danso et al., 2024) few studies have explored how this perception influences site workers' risk-taking behaviours during construction. This study aims to examine how construction site workers perceive and judge safety risks in risk-taking behaviours of site workers for intervention safety policy framework that may encourage safe work. Design/methodology/approach: The study employed Pictorial-based Q-Methodology, which documented 63 picture scenarios of risk-taking behaviours from building sites and submitted them for validation from H&S inspectors. In total, 33 pictures emerged as having great potential to cause harm. After using these 33 pictures to elicit data from randomised site workers, the study used Frequency Tabulation, Relative Importance Index (RII. Weak management engagement and limited commitment to safety contribute to this perception. However, respectful engagement, clear communication, and management presence can improve workers' perceptions of safety, encouraging compliance and safer behaviours (Baah, Acheampong, Osei-Asibey, & Afful, 2023). Addressing these perceptions is vital, as they influence the effectiveness of safety programs and the overall safety climate on construction sites (Danso et al., 2024) few studies have explored how this perception influences site workers' risk-taking behaviours during construction. This study aims to examine how construction site workers perceive and judge safety risks in risk-taking behaviours of site workers for intervention safety policy framework that may encourage safe work. Design/methodology/approach: The study employed Pictorial-based Q-Methodology, which documented 63 picture scenarios of risk-taking behaviours from building sites and submitted them for validation from H&S inspectors. In total, 33 pictures emerged as having great potential to cause harm. After using these 33 pictures to elicit data from randomised site workers, the study used Frequency Tabulation, Relative Importance Index (RII.

Furthermore, vector-borne exposure, an important consideration in Nigeria's humid coastal environments, was considered mainly "Minimal" (66.6%) or "None" (20.6%) by most respondents, suggesting that companies are aware of and actively manage environmental health risks like malaria and other insect-borne diseases. However, this relatively low perceived exposure may also reflect underreporting or lack of structured surveillance systems, especially for non-acute or chronic vector-related conditions.

Findings on emergency preparedness and medical response capability reveal concerning trends. While 59.8% of workers indicated the presence of "some protocols, not effective," only 10.1% report-

ed the existence of “comprehensive” emergency response systems. The speed of medical assistance is similarly troubling: only 1.5% reported “immediate response,” while most (33.2%) experienced “several hours delay.” These deficiencies point to critical gaps in both on-site preparedness and off-site healthcare coordination. Many organizations and worksites have only partial or ineffective emergency protocols, with comprehensive systems being rare, mirroring broader regional challenges where preparedness plans often exist in name but lack practical effectiveness or coordination (ILO, 2019). Delays in medical response are widespread, with most workers facing long wait times before receiving help, mainly due to poor communication, lack of real-time data sharing, and weak multisector coordination (ILO, 2019). Preparedness efforts, such as regional exercises and capacity-building, underscore the need for stronger contingency plans, standardized procedures, and closer collaboration among disaster agencies and leadership (ILO, 2019; Marston et al., 2017). Trust, transparency, and community engagement are also vital for ensuring accountability during crises (Ryan, Giles-Vernick, & Graham, 2019) national and international responders holding a wide variety of roles during the epidemic. Focusing on responder’s experiences of communities’ trust during the epidemic, this qualitative study identifies and explores social techniques for effective emergency response. The response required individuals with diverse knowledges and experiences. Responders’ included on-The-ground social mobilisers, health workers and clinicians, government officials, ambulance drivers, contact tracers and many more. We find that trust was fostered through open, transparent and reflexive communication that was adaptive and accountable to community-led response efforts and to real-Time priorities. We expand on these findings to identify ‘technologies of trust’ that can be used to promote actively legitimate trustworthy relationships. Responders engaged the social technologies of openness (a willingness and genuine effort to incorporate multiple perspectives. Overall, West Africa’s emergency preparedness remains inadequate, particularly in coastal areas where access is further hindered by weather, flooding, and poor infrastructure (ILO, 2019; Marston et al., 2017; Ryan et al., 2019) Sierra Leone, and Guinea and public health progress that was made as a result of the Ebola response in 4 key areas: emergency response, laboratory capacity, surveillance, and workforce development. We further highlight ways in which capacity-building efforts such as those used in West Africa can be accelerated after a public health crisis to improve preparedness for future events.”

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The results further highlight corruption and bribery as significant challenges, with 37.2% rating them “High” and another 18.2% “Moderate.” This points to systemic governance weaknesses where enforcement of OHS standards may be undermined by collusion between regulators and firms. These studies suggest that high levels of corruption and bribery undermine the enforcement of OHS standards by weakening institutional effectiveness and enabling collusion between regulators and firms, ultimately leading to poorer safety outcomes. The perception of corruption as a barrier is consistent with prior studies, such as Umeokafor et al. (2014) while the Labour, Safety, Health and Welfare Bill of 2012 empowers the National Council for Occupational Safety and Health of Nigeria to administer the proceeding regulations on its behalf. Sadly enough, the impact of the enforcement authority is ineffective, as the key stakeholders pay less attention to OSH regulations; thus, rendering the OSH scheme dysfunctional and unenforceable, at the same time impeding OSH development. For optimum OSH in Nigeria, maximum enforcement and compliance with the regulations must be in place. This paper, which is based on conceptual analysis, reviews literature gathered through desk literature search. It identified issues to OSH enforcement such as: political influence, bribery and corruption, insecurity, lack of governmental commitment, inadequate legislation inter alia. While recommending ways to improve the enforcement of OSH regulations, it states that self-regulatory style of enforcing OSH regulations should be adopted by organisations. It also recommends that more OSH inspectors be recruited; local government authorities empowered to facilitate the enforcement of OSH regulations. Moreover, the study encourages organisations to champion OSH enforcement, as it is beneficial to them; it concludes that the burden of OSH improvement in Nigeria is on the government, educational authorities, organisations and trade unions.

“author”: [“dropping-particle”: “”, “family”: “Umeokafor”, “given”: “Nnedinma”, “non-dropping-particle”: “”, “parse-names”: false, “suffix”: “”], [“dropping-particle”: “”, “family”: “Isaac”, “given”: “David”, “non-dropping-particle”: “”, “parse-names”: false, “suffix”: “”], [“dropping-particle”: “”, “family”: “Jones”, “given”: “Keith”, “non-dropping-particle”: “”, “parse-names”: false, “suffix”: “”], [“dropping-particle”: “”, “family”: “Umeadi”, “given”: “Boniface”, “non-dropping-particle”: “”, “parse-names”: false, “suffix”: “”], “container-title”: “European Scientific Journal”, “id”: “ITEM-1”, “issue”: “May”, “issued”: {“date-parts”: [“2014”]}, “page”: “1857-7881”, “title”: “Enforcement of Occupational Safety and Health Regulations in Nigeria: an Exploration”, “type”: “article-journal”, “volume”: “3”, “uris”: [“http://www.mendeley.com/documents/?uuid=f8006573-ac72-4819-9856-bcaecfa08c6c”]], “mendeley”: {“formattedCitation”: “(Umeokafor, Isaac, Jones, & Umeadi, 2014, who identified regulatory laxity and institutional compromise as key setbacks for workplace safety in Nigeria. Closely related to this is the issue of political influence, which 42% of respondents rated as “High” or “Very High”. This suggests that political interference may shape prioritization, inspection frequency, or the outcome of OHS assessments, particularly on government-linked projects. Such interference can reduce accountability and incentivize shortcuts, ultimately weakening safety culture. Notably, poor health and safety culture was rated “High” or “Very High” by over 42% of respondents, signalling that behavioural and attitudinal factors remain central barriers to OHSM. This issue is may be closely linked to behavioural and attitudinal factors, such as lack of worker engagement, weak safety leadership, and the failure to embed OHS values into the company ethos. Capacity gaps, including a shortage of skilled staff and insufficient government commitment, further undermine the effectiveness of OHSM. Furthermore, the reported lack of skilled staff (35.7%) and inadequate government commitment (18.5% rated as “High” or “Very High”) highlight capacity gaps both within the workforce and regulatory institutions.

Level of Challenges

The distribution of overall challenge levels, illustrated in this study, reflects that most workers (58.5%) experienced *moderate challenges*, indicating that while safety structures exist, they are undermined by implementation gaps. Interestingly, a sizeable proportion (40.4%) rated challenges as *low*, highlighting differences in company practices. Only a small minority (11.1%) experienced *high challenges*, suggesting that extreme safety failures are not the norm but remain significant for specific projects.

This research reveals significant differences in OHSM challenges between indigenous and international firms ($p < 0.001$). Indigenous companies reported higher proportions of *low challenges* (49.7%) than international firms (30.0%), but international firms faced more *moderate challenges* (67.9%) and fewer high challenges (2.1%). This research further shows significant disparities across several challenge areas.

This may reflect differences in project scale and complexity, as international projects often involve larger, more technically demanding sites with stricter reporting and documentation requirements. Workforce composition and local recruitment practices may also contribute, with indigenous firms employing more local labour familiar with site conditions. International firms reported higher mean scores in areas such as vector-borne exposure, medical assistance speed, emergency protocols, and telemedicine access, suggesting they may operate in higher-risk environments or adopt stricter reporting standards. Conversely, indigenous companies faced significantly greater challenges, including workers' resistance, a lack of skilled staff, and inadequate government support. These findings highlight contextual differences in organizational capacity and workforce characteristics, aligning with studies that noted that multinational firms often implement stricter safety frameworks but face higher logistical challenges.

Furthermore, this research shows statistically significant state-level differences ($p < 0.005$). Cross River reported the highest proportion of *moderate challenges* (88.4%), while Lagos recorded the highest percentage of *low challenges* (54.7%). Bayelsa reported the highest *challenges* (2.0%), reflecting the compounded impact of environmental and institutional factors. These regional variations align with findings by Walters and Wadsworth (2014), who argued that geographic and political contexts strongly influence the effectiveness of OHSM in Nigeria. State-level differences, such as Lagos reporting more low challenges and Cross River showing higher moderate challenges, could be influenced by regulatory intensity, infrastructure readiness, and local governance practices. Alternative explanations could be differences in reporting practices, environmental hazards, and resource availability, highlighting the need for context-sensitive interpretation of OHSM challenges.

The ranking of challenges provides further insights into priority issues. Workers' resistance emerged as the top challenge (mean = 3.98), confirming the significance of behavioural non-compliance. Corruption, poor safety culture, and political influence also ranked high, reinforcing systemic barriers beyond organizational control. Resource-related challenges, such as inadequate preventive measures (mean = 2.95), weak health screenings (2.91), and insufficient training (2.62), ranked lowest, indicating that while resources are important, behavioural and governance challenges present greater obstacles. This research further disaggregates challenge scores between company types. Indigenous companies faced significantly greater challenges with *workers' resistance* (3.50 vs. 3.23), reflecting behavioural management difficulties. Conversely, international companies faced significantly higher challenges in structural and systemic areas such as *training adequacy* (2.59 vs. 2.12), *telemedicine access* (3.03 vs. 2.42), and *medical assistance speed* (3.31 vs. 2.74). These differences suggest that while indigenous firms struggle with workforce compliance, international firms encounter systemic and logistical barriers.

Furthermore, these managerial respondents in this study also identify several enduring challenges that hinder the full realization of safety goals. The most prominent barriers include non-compliance and worker attitudes, which reflect deep behavioural and cultural resistance to safety practices. In Nigeria, the refusal to wear PPE or follow procedures, even when equipment is provided, demonstrates that enforcement alone is insufficient; sustained education and behavioural change strategies are essential (Izudi, Ninsiima, & Alege, 2017). Kampala district has the highest workplace injury and fatality rates. However, information on personal protective equipment (PPE). Resource and budgetary constraints compound these issues, particularly when safety investments compete with other project priorities. Respondents in managerial roles cited difficulties in securing PPE, organizing training, and maintaining infrastructure due to limited financial backing or centralized bureaucratic delays. This is a common issue in many sub-Saharan countries, where fragmented procurement systems and budget dependencies hinder project-level flexibility (Rai, 2021). The result is a disconnect between policy and practice, with safety sometimes compromised due to a lack of timely resources. Logistical delays in PPE supply and inadequate provisioning for site visitors highlight operational inefficiencies that can expose workers to temporary hazards. These issues are often less about neglect and more about systemic bottlenecks, such as unreliable suppliers or rigid approval hierarchies. Compared with other studies (Isah, 2019; Abina et al., 2024), multiple studies report similar logistical and institutional setbacks, suggesting a regional pattern.

Educational and cultural barriers further complicate the implementation of safety measures in this study. Many workers in Nigeria's construction industry are drawn from informal labour markets, with limited formal schooling or awareness of occupational risks. The use of alcohol or disregard for protective equipment is not merely defiance but may also reflect poor understanding or traditional notions of masculinity and invincibility. As echoed in (Siuta, Kukfisz, Kuczyńska, & Mitkowski, 2022) incidents, and unsafe behaviors in the process industry, so as to make it more sustainable and economically responsi-

ble. Measurement, investigation, and assessment of the safety culture using interviews, questionnaires, behavior observation, reviewing documentation, and its impact on the safety performances of an organization is complicated, challenging, and requires a commitment to all employees. The aim of this study was to propose a novel, unique semi-quantitative methodology for the determination of a total process safety culture index and parametric model of process safety culture maturity in an organization based on the Bradley model. The methodology includes a questionnaire concerning different process safety culture factors, calculation procedures, and a graphical tool. In addition, three quantitative survey indicators were proposed: indicators of direct communication, average communication time, and the applicability rate of the proposed changes by employees. A fully-developed total process safety culture index allows for identifying, hierarchizing, and benchmarking different factors of the safety culture among companies and sectors. Moreover, it will enable identifying the area of actions required to improve safety practices and elements applied to the organization analyzed. The proposed methodology was verified in a case study of one energy company with three locations in Poland and can be easily applied to different industrial fields, including logistics and warehousing, the food industry, the paper industry, security services, fire services, and environmental and other agencies."

"author":{"dropping-particle":"","family":"Siuta","given":"Dorota","non-dropping-particle":"","parse-names":false,"suffix":""},"dropping-particle":"","family":"Kukfisz","given":"Bożena","non-dropping-particle":"","parse-names":false,"suffix":""},"dropping-particle":"","family":"Kuczyńska","given":"Aneta","non-dropping-particle":"","parse-names":false,"suffix":""},"dropping-particle":"","family":"Mitkowski","given":"Piotr Tomasz","non-dropping-particle":"","parse-names":false,"suffix":""},"container-title":"International Journal of Environmental Research and Public Health","id":"ITEM-1","issue":"5","issued":{"date-parts":[["2022"]]},"title":"Methodology for the Determination of a Process Safety Culture Index and Safety Culture Maturity Level in Industries","type":"article-journal","volume":"19"},"uris":["http://www.mendeley.com/documents/?uuid=f5c1b957-8bf5-4833-87f4-0a8701dac108"]},"mendeley":{"formattedCitation":"(Siuta, Kukfisz, Kuczyńska, & Mitkowski, 2022, Improving the safety culture within the Nigerian construction industry is critical to ensuring that health and safety practices are effectively implemented Systemic and institutional hurdles such as centralized budget controls, weak regulatory enforcement, and complexity in legal standards form the structural backdrop against which these operational and human challenges play out. As found in the UK and Australia (Hale et al., 2010), even the best-designed safety frameworks struggle without decentralized authority and streamlined institutional support. In Nigeria, the reliance on federal approvals for routine safety expenditures limits the responsiveness of site-level management to emerging risks.

5. Limitations and Strengths

Limitations

This study has some limitations that should be acknowledged. First, its cross-sectional design limits the ability to establish causal relationships between identified challenges and OHSM outcomes. Second, reliance on self-reported survey data may introduce response bias, particularly in sensitive areas such as corruption and non-compliance. Third, the study was restricted to Nigeria's coastal cities, which may not fully capture the experiences of inland regions where construction practices and regulatory oversight may differ. Finally, while qualitative interviews enriched the findings, the perspectives were limited to site managers, potentially excluding frontline workers' voices.

Strengths

Despite these limitations, studying has several strengths. It is one of the few comprehensive investigations of OHSM challenges in Nigeria's coastal construction sector, combining both quantitative and qualitative evidence. The inclusion of multiple states and company types (indigenous and international) enabled meaningful comparative and regional analyses. Furthermore, the relatively large sample size enhanced the reliability and generalizability of findings. By triangulating quantitative trends with qualitative insights, the study provides a nuanced understanding of both systemic and behavioural barriers to effective OHSM implementation, offering practical implications for policy and industry stakeholders.

6. Conclusion

This study highlights that Occupational Health and Safety Management (OHSM) in Nigeria's coastal construction sector is challenged by several interconnected factors that go beyond the availability of resources or training. Although many companies show moderate to good preparedness, key barriers, including workers' resistance, corruption, weak safety culture, and political interference, persist. Differences observed between indigenous and international firms, as well as across states, further indicate that organizational practices, governance structures, and local contexts play a significant role in shaping OHSM implementation. Notably, the findings highlight that behavioural non-compliance and systemic governance failures, rather than resource limitations, shape OHSM outcomes. Addressing these challenges requires a multidimensional approach that combines continuous worker education, stricter enforcement of safety regulations, timely allocation of resources, and a more substantial government commitment. By targeting both organizational behaviours and institutional weaknesses, Nigeria's construction industry can move toward safer, more sustainable, and globally competitive practices.

Recommendations

Based on the study's findings, we propose the following prioritized actions:

1. **Construction Companies:** Implement ongoing worker sensitization and behavioural training to address resistance and improve safety compliance. Ensure timely provision and monitoring of PPE and safety protocols.
2. **Regulators and Government Agencies:** Strengthen enforcement of OHS regulations, reduce bureaucratic delays, and monitor compliance to mitigate corruption and political interference.
3. **Professional Bodies (e.g., COREN, IOSH, ISPON):** Support capacity-building and advocacy programs to foster a stronger safety culture and provide guidance on best practices.

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