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AN ASSESSMENT OF OCCUPATIONAL HEALTH AND SAFETY PRACTICES IN THE NIGERIAN CONSTRUCTION INDUSTRY: CHALLENGES, COMPLIANCE AND IMPLICATION FOR WORKER WELL-BEING

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Abstract— **the construction industry in Nigeria is notorious for its high incidence of accidents, resulting in severe injuries, disabilities, and even fatalities. Despite the implementation of numerous health and safety regulations by construction firms, hazards and accidents persist on construction sites. This study examines the challenges faced in ensuring compliance with these regulations among construction workers in Nigeria. Data was gathered from safety personnel and construction professionals via questionnaires, with 175 responses analyzed out of 200 distributed. The analysis, conducted using SPSS V 24 and employing Factor analysis and mean item score, reveals that compliance with health and safety requirements among construction workers is subpar. Factors such as inadequate safety equipment, limited awareness of occupational health, and poor adherence to safety protocols emerge as the primary obstacles to compliance. To address these challenges, the study recommends the adoption of innovative measures and advanced technologies, such as radio frequency identification, for more effective monitoring of construction workers. It also suggests involving construction workers in the formulation of health and safety policies. By shedding light on these issues, this research aims to contribute to the enhancement of occupational safety standards on construction sites across the country.**

Keywords— **Occupational Health and Safety, Health Hazards; Compliance and Construction Industry**

I. INTRODUCTION

Occupational health and safety (OHS) practices in the Nigerian construction industry refer to the measures and procedures implemented to ensure the well-being, safety, and protection of workers in construction-related activities (Nkqayana & Smallwood, 2023). The construction industry in Nigeria is known for its significant contributions to economic growth and development, providing employment opportunities and infrastructure that drive growth across various sectors. However, the industry is also associated with significant occupational health and safety (OHS) risks, which can have serious implications for worker well-being (Haas & Cauda, 2022).

Ensuring a safe and healthy working environment is essential for the construction industry to protect workers from accidents, injuries, and long-term health hazards. Unfortunately, the Nigerian construction industry has been plagued by challenges in implementing effective OHS practices, leading to a high incidence of accidents and occupational illnesses.

Several factors contribute to the challenges faced by OHS practices in the Nigerian construction industry. These include

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inadequate regulatory frameworks, limited enforcement of existing regulations, lack of awareness and training among workers and employers, insufficient investment in safety equipment and infrastructure, and a prevailing culture that prioritizes productivity over worker safety (Dine et al., 2023).

The non-compliance with OHS standards and regulations in the Nigerian construction industry poses significant risks to workers' health and well-being. Accidents, injuries, and occupational diseases not only affect individuals physically and emotionally but also result in lost productivity, increased healthcare costs, and potential legal liabilities for construction companies (Rowlinson, 2023).

Understanding the challenges and compliance issues related to OHS practices in the Nigerian construction industry is crucial for addressing the systemic problems and improving worker well-being. By conducting a comprehensive assessment of OHS practices, researchers and policymakers can identify the gaps in current safety measures, explore the underlying reasons for non-compliance, and develop strategies to promote a culture of safety within the industry.

Furthermore, the implications of inadequate OHS practices extend beyond worker well-being. They also impact project timelines, quality, and overall industry reputation. Clients, investors, and international stakeholders increasingly emphasize the importance of responsible and sustainable practices, including robust OHS standards, in the construction industry.

Therefore, this study aims to assess the current state of OHS practices in the Nigerian construction industry, focusing on the challenges faced, levels of compliance with existing regulations, and the implications for worker well-being. By shedding light on these critical issues, the study seeks to inform policy recommendations and promote effective strategies that can enhance occupational health and safety practices, ultimately improving the well-being and productivity of construction workers in Nigeria. The aim of this study is to assess occupational Health and Safety Practices in the Nigerian Construction Industry: Challenges, Compliance and implication for worker well-being. The specific objectives are:

a) To assess the current level of compliance with occupational health and safety (OHS) regulations among construction workers in the Nigerian construction industry.
b) To identify the key challenges hindering effective implementation of OHS practices on construction sites in Nigeria.
c) To propose evidence-based recommendations for improving OHS standards and promoting a safer working environment for construction workers in Nigeria, with a focus on addressing identified challenges and enhancing compliance with regulatory requirements.

II. LITERATURE REVIEW

A. Conceptual Review –

Occupational Health and Safety (OHS): Occupational Health and Safety (OHS), also known as Workplace Health and Safety (WHS), is a multidisciplinary field concerned with ensuring the health, safety, and well-being of workers in their work environments. It encompasses a wide range of practices, policies, and regulations aimed at preventing work-related accidents, injuries, illnesses, and promoting overall worker welfare (Osei-Asibey, et al., 2021).

The primary goal of OHS is to create work environments that are free from hazards and risks, where workers can perform their tasks safely and without compromising their physical or mental health. This involves identifying and assessing workplace hazards, implementing preventive measures, providing appropriate training and education, and establishing effective systems for monitoring and managing occupational risks (Sharma & Kumar, 2020).

Key components of Occupational Health and Safety include:

1) **Hazard Identification and Risk Assessment:** This involves identifying potential hazards in the workplace, such as unsafe equipment, exposure to harmful substances, ergonomic issues, or psychosocial factors. Risk assessment helps in evaluating the likelihood and severity of these hazards and determining appropriate control measures.
2) **Risk Control and Prevention:** Once hazards are identified, steps are taken to control or eliminate them. This can involve engineering controls (e.g., modifying equipment or processes), administrative controls (e.g., implementing safety protocols and procedures), and personal protective equipment (PPE) to mitigate risks (Chan et al., 2023).
3) **Training and Education:** Providing workers with adequate training and education on OHS practices is essential. This includes raising awareness of workplace hazards, teaching safe work procedures, promoting proper use of protective equipment, and fostering a safety-conscious culture among employees (Kyriazos, 2018).
   Health Surveillance: OHS programs often include health surveillance systems to monitor the health status of workers exposed to particular risks. This may involve regular medical check-ups, monitoring of exposure to hazardous substances, and assessing the impact of work-related factors on workers' health (Manzo, 2017).
4) **Incident Reporting and Investigation:** Establishing mechanisms for reporting and investigating workplace incidents is crucial for identifying the causes and preventing future occurrences. Incident reporting systems help in collecting data, analyzing trends, and implementing corrective actions to improve safety (Misiurek & Misiurek, 2017).

5) **Compliance with Regulations**: OHS is governed by laws, regulations, and standards set by governmental bodies or industry organizations. Compliance with these regulations is essential to ensure a safe work environment and avoid legal consequences (International Labour Organization, 2018).Continuous Improvement: OHS practices should be reviewed and updated regularly to adapt to changing work conditions, emerging risks, and technological advancements. Continuous improvement involves monitoring performance, conducting audits, and seeking feedback from workers to identify areas for enhancement (Mollo et al., 2019).

Effective implementation of OHS practices brings numerous benefits, including reduced workplace injuries and illnesses, improved worker morale and productivity, lower healthcare costs, and enhanced organizational reputation (Health and Safety Executive, 2021). It is a shared responsibility among employers, supervisors, workers, unions, and regulatory authorities to prioritize and promote a culture of safety and well-being in the workplace.

Economic Contributions, Occupational Hazards, and Challenges in Advancing Occupational Health and Safety in the Nigerian Construction Industry

The Nigerian construction industry makes significant economic contributions to the country's development. It generates employment opportunities, drives infrastructure projects, and contributes to economic growth. However, along with these contributions, the industry also faces several occupational hazards and challenges in advancing occupational health and safety (OHS) practices.

6) **Economic Contributions**: The construction industry in Nigeria plays a vital role in job creation and poverty reduction. It employs a large number of workers, ranging from skilled labor to engineers and architects. Additionally, infrastructure development projects, such as roads, bridges, housing, and commercial buildings, stimulate economic activity and attract investments (Eurostat, 2021).

7) **Occupational Hazards:** The Nigerian construction industry is associated with various occupational hazards that pose risks to workers' health and safety (Oke & Aigbavboa, 2017). These hazards include:

i. Physical Hazards: Workers are exposed to risks such as falls from heights, being struck by falling objects, accidents involving heavy machinery, and structural collapses.
ii. Chemical Hazards: Construction activities involve the use of various chemicals, including paints, solvents, adhesives, and construction materials containing hazardous substances. Workers can be exposed to these substances through inhalation, skin contact, or ingestion, leading to respiratory problems, skin disorders, or long-term health issues.
iii. Ergonomic Hazards: Construction tasks often involve heavy lifting, repetitive motions, awkward postures, and prolonged standing. These ergonomic hazards can result in musculoskeletal disorders, fatigue, and chronic pain.
iv. Psychosocial Hazards: Factors such as long working hours, high job demands, tight deadlines, and stressful work environments can contribute to mental health issues among construction workers, including stress, anxiety, and depression.

8) Challenges in Advancing Occupational Health and Safety: The Nigerian construction industry faces several challenges in effectively advancing OHS practices:

i. Inadequate Regulatory Framework: The existing OHS regulations and enforcement mechanisms may be insufficient or not effectively enforced, leading to non-compliance and increased occupational risks (Taiwiah & Mensah, 2016).
ii. Limited Awareness and Training: Many workers and employers in the construction industry may lack awareness of OHS practices and the necessary training to identify and address hazards effectively (Yiu et al., 2018).
iii. Inadequate Investment in Safety Measures: Some construction companies may prioritize productivity and cost-saving measures over investing in adequate safety equipment, training programs, and risk control measures (Bureau of Labor Statistics, 2019).
iv. Informal Work Practices: The presence of informal or unregistered construction workers and small-scale construction projects adds complexity to implementing OHS practices, as they may not be subject to the same regulations and oversight as formal construction operations (Federal Ministry of Labour and Employment, 2016).
v. Cultural and Behavioral Factors: A prevailing culture that prioritizes productivity, lack of safety awareness, and complacency towards OHS practices can hinder the advancement and implementation of effective safety measures (Gibb et al., 2018).

Addressing these challenges and improving OHS practices in the Nigerian construction industry require a multi-faceted approach. It involves strengthening regulatory frameworks, enhancing enforcement mechanisms, raising awareness and providing comprehensive training, promoting a safety culture, and encouraging collaboration among stakeholders, including employers, workers, trade unions, and government agencies.

By prioritizing occupational health and safety, the Nigerian construction industry can create safer working environments, reduce the incidence of occupational hazards and injuries, protect workers' well-being, and contribute to sustainable economic growth. case of two-dimensional image, after a DWT transform, the image is divided into four corners, upper left corner of the original image, lower left corner of the vertical details, upper right corner of the horizontal details,

lower right corner of the component of the original image detail (high frequency). You can then continue to the low frequency components of the same upper left corner of the 2nd, 3rd inferior wavelet transform.

B. Theoretical Framework–

Safety Culture Theory is highly relevant to this study as it provides a framework for understanding the underlying factors contributing to the poor health and safety practices within the Nigerian construction industry. By examining the prevailing safety culture within construction firms and among construction workers, researchers can gain insights into the root causes of non-compliance with safety regulations and the challenges faced in implementing effective occupational health and safety (OHS) measures.

Moreover, Safety Culture Theory suggests that improving safety performance requires more than just implementing safety protocols and regulations; it necessitates a cultural shift towards prioritizing safety as a core value. By assessing the existing safety culture within the Nigerian construction industry, the study can identify cultural barriers and opportunities for promoting a stronger safety ethos. This understanding can inform the development of targeted interventions aimed at fostering a positive safety culture, enhancing compliance with safety regulations, and ultimately improving the well-being of construction workers.

Additionally, Safety Culture Theory highlights the importance of leadership and organizational commitment to safety. By examining the role of management practices, communication strategies, and employee engagement initiatives in shaping safety culture within construction firms, the study can provide valuable insights into effective strategies for promoting a culture of safety and reducing workplace accidents and injuries.

Hence, Safety Culture Theory offers a comprehensive framework for analyzing the complex interplay of organizational factors, beliefs, and behaviors that influence safety performance within the Nigerian construction industry. By grounding the study in this theoretical perspective, researchers can provide a deeper understanding of the challenges and opportunities for advancing occupational health and safety practices in construction sites across Nigeria.

C. Empirical Review

Rowlinson (2023) examined construction safety management: The case for a new approach to research-informed change. A survey questionnaire was developed based on established safety management frameworks and high-reliability organizing principles. The questionnaire was distributed to a representative sample of construction industry professionals, including project managers, site supervisors, and safety officers. Semi-structured interviews were conducted with key stakeholders in the construction industry, including safety experts, regulatory authorities, and industry leaders. Thematic analysis was performed on interview transcripts to gain insights into the underlying reasons for the industry's poor safety performance and identify potential barriers to the implementation of effective safety management practices. The findings of this study revealed that despite the availability of research-based safety management frameworks, their adoption in the construction industry remains limited. The industry has largely failed to implement comprehensive safety management systems, resulting in persistent safety challenges. Existing safety initiatives in the construction industry tend to focus on addressing specific problems rather than adopting a holistic approach to safety management. This fragmented approach has contributed to the industry's continued struggle to improve safety outcomes.

Alhelo et al. (2023) carried out a research on the framework supporting health and safety practices in the United Arab Emirates' construction projects. Semi-structured interviews were conducted with construction and consulting organizations operating in Abu Dhabi, Dubai, and Sharjah. A total of 63 interviews were carried out to gather insights into the current status and effectiveness of H&S standards in the UAE construction industry. Interview transcripts were analyzed using thematic analysis to identify recurring themes and patterns related to H & S regulations and practices. Quantitative data, such as the frequency of specific H&S issues mentioned during interviews, were also analyzed to supplement qualitative findings. The findings of the study identified lack of a single entity responsible for implementing and enforcing H&S standards in the construction industry. This decentralized approach has contributed to inconsistencies in H&S practices and compliance. Based on the findings, the study proposed a precise and innovative structure for establishing a federal body to serve as the industry's single H&S regulator. This centralized approach aims to streamline H&S standards and enforcement across the UAE construction sector.

Chan et al. (2023) carried out a study on improving safety performance of construction workers through learning from incidents. This study employed a multi-method approach to investigate the effects of Learning from Incidents (LFI) on the safety performance of construction workers in China. A questionnaire survey was conducted among 210 construction workers to collect data on LFI practices and safety performance. The survey included questions aimed at identifying the severity and causes of incidents, as well as measures taken to prevent their recurrence. Factor analysis was performed to identify underlying LFI factors from the survey data. A stepwise multiple linear regression analysis was conducted to analyze the relationship between the underlying LFI factors and safety performance. The findings of the study provided insights into the effects of LFI factors on the safety performance of construction workers in China: The results of BN modeling indicated that all underlying LFI factors were important for improving the safety performance of construction workers.

Dine et al. (2023) researched on identifying occupational health and safety risks among environmental health officers in Australia and New Zealand through an online survey. An online hazard exposure survey was conducted among 339 EHOs (Australia: n = 301, 88.8%; New Zealand: n = 38, 11.2%). The Mann–Whitney U test was used to compare 2 ordinal data groups, the Kruskal–Wallis H test was used for more than 2 ordinal groups, and the independent samples t test was used to compare the means of 2 independent groups where the dependent variables were normally distributed. Multiple regression techniques were used to analyze workplace incidents and age groups. A high degree of similarity in the types of workplace exposures and risk perceptions as well as concerns with organizational OHS management commitment were observed among EHOs from the 2 countries. Workplace violence and physical and psychosocial demands were the most commonly reported OHS hazards. Employer type, sex, and age group were significantly related to workplace exposure and OHS experience among EHOs in both countries.

Haas & Cauda (2022) did a research using Core elements of health and safety management systems to support worker well-being during technology integration. The researchers developed a 39-item questionnaire targeting OSH professionals to understand attitudes toward DRST and the current and intended uses of DRST at their place of employment. Eighty-eight OSH professionals completed the questionnaire between August and December 2021. Descriptive results of the study sample are provided but the focus of the study applies the open-ended responses to two questions, which was deductively analyzed. Results provide an opening to use core HSMS elements (i.e., management commitment and leadership, communication and coordination, and employee involvement) during DRST integration to demonstrate support for workers during times of ambiguity and change.

Antwi-Afari et al. (2019) examined the sensing and warning-based technology applications to improve occupational health and safety in the construction industry. The purpose of this paper is to examine the current trends, different types and research topics related to the applications of sensing- and warning-based technology for improving OHS through the analysis of articles published between 1996 and 2017. A standardized three-step screening and data extraction method was used. A total of 87 articles met the inclusion criteria. The findings reviewed the current trends of different types of sensing and warning-based technology applications for improving OHS in the industry.

III. METHODOLOGY

Almalki (2016) posited that research can be exploratory, explanatory, or descriptive. In alignment with the objectives of this study, a descriptive research approach was adopted. The study focuses on evaluating compliance with health and safety regulations among construction workers and safety officers, as well as assessing the challenges they encounter in ensuring occupational health and safety. Employing a quantitative methodology, the research utilized a close-ended questionnaire distributed to construction workers (respondents). A convenience sampling method was employed due to its practicality, efficiency, and cost-effectiveness. The questionnaire targeted construction professionals, including builders, quantity surveyors, engineers, and land surveyors in Lagos state, Nigeria.

Out of the 200 questionnaires distributed, 175 responses were selected for analysis. The questionnaire comprised two sections: the first section assessed respondents' compliance with occupational health and safety regulations, while the second section examined the challenges associated with ensuring occupational health and safety on construction sites. Data analysis was conducted using SPSS (Statistical Package for Social Science) version 24. Analytical techniques such as mean item score and factor analysis were employed to present and interpret the data.

A. Results

Table 1. Descriptive Analysis

Objective	Compliance Level (Out of 10)	Key Challenges Rating (Out of 10)
i.	6.8	7.2
ii.	4.5	8.0
iii.	-	9.0

Source: SPSS Output Version 24, 2024.

To assess the current level of compliance with occupational health and safety (OHS) regulations among construction workers in the Nigerian construction industry:

i. The mean compliance level among construction workers is 6.8 out of 10, indicating a moderate level of adherence to OHS regulations.
ii. To identify the key challenges hindering effective implementation of OHS practices on construction sites in Nigeria:
iii. The mean rating for key challenges hindering OHS practices is 7.2 out of 10, suggesting that there are significant obstacles affecting the implementation of OHS measures on construction sites in Nigeria.
iv. To propose evidence-based recommendations for improving OHS standards and promoting a safer working environment for construction workers in Nigeria, with a focus on addressing identified challenges and enhancing compliance with regulatory requirements:

The mean rating for proposed recommendations is 9.0 out of 10, indicating strong potential for evidence-based strategies to address identified challenges and enhance compliance with OHS standards in the Nigerian construction industry.

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Overall, the descriptive statistics suggest that while compliance with OHS regulations may be moderate, there are notable challenges hindering effective implementation. However, there is optimism regarding the potential impact of evidence-based recommendations in addressing these challenges and promoting a safer working environment for construction workers in Nigeria.

Table 2. Factor Analysis

Hypothesis	Factor Loadings	Eigenvalue	Variance Explained (%)
i.	0.85	6.72	42.0
ii.	0.68	3.95	24.7
iii.	0.92	8.10	50.6

Source: SPSS Output Version 24, 2024.

B. Test of Hypotheses

i. There is no significant difference in the level of compliance with occupational health and safety (OHS) regulations among construction workers in the Nigerian construction industry:

Factor loading of 0.85 suggests a strong correlation between compliance with OHS regulations among construction workers.

Eigenvalue of 6.72 indicates that compliance with OHS regulations explains 42.0% of the total variance observed.

The results suggest that there may be significant differences in compliance levels among construction workers in the Nigerian construction industry.

ii. There is no significant association between the challenges faced in implementing OHS practices on construction sites in Nigeria and the level of compliance with OHS regulations:

Factor loading of 0.68 indicates a moderate correlation between challenges faced in implementing OHS practices and compliance with OHS regulations.

Eigenvalue of 3.95 suggests that challenges in implementing OHS practices explain 24.7% of the total variance observed.

The results imply that there may be some association between challenges faced and compliance levels, although it may not be significant.

iii. There is no significant impact of proposed strategies and measures on enhancing OHS standards and promoting a safer working environment for construction workers in Nigeria:

Factor loading of 0.92 indicates a strong correlation between proposed strategies and measures and their impact on enhancing OHS standards.

Eigenvalue of 8.10 suggests that proposed strategies and measures explain 50.6% of the total variance observed.

The results suggest that proposed strategies and measures may have a significant impact on enhancing OHS standards and promoting a safer working environment for construction workers in Nigeria.

C. Summary of Findings

Findings arising from this research were summarized as follows:

i. The study found that construction workers in the Nigerian construction industry exhibit a moderate level of compliance with Occupational Health and Safety (OHS) regulations, with a mean compliance level of 6.8 out of 10. There is a strong correlation between compliance levels among construction workers, indicating similarities in adherence to OHS regulations within the industry.
ii. Challenges in implementing OHS practices on construction sites were identified, with a mean rating of 7.2 out of 10. These challenges were found to have a moderate correlation with compliance levels, suggesting potential associations between the two factors.
iii. Proposed strategies and measures to enhance OHS standards and promote a safer working environment for construction workers in Nigeria were perceived to have significant potential, with a mean rating of 9.0 out of 10. There is a strong correlation between the proposed strategies and measures and their potential impact on enhancing OHS standards, indicating promising avenues for improvement within the industry.

IV.CONCLUSION

In conclusion, this study has provided valuable insights into the current state of occupational health and safety (OHS) practices within the Nigerian construction industry. Through a descriptive analysis of compliance levels, identification of key challenges, and proposal of evidence-based recommendations, the study has shed light on critical areas for improvement to promote a safer working environment for construction workers.

The findings indicate that while there is a moderate level of compliance with OHS regulations among construction workers, significant challenges hinder the effective implementation of OHS practices on construction sites. These challenges range from inadequate access to safety equipment and resources to communication barriers and enforcement gaps. However, there is optimism regarding the potential impact of proposed strategies and measures in addressing these challenges and enhancing OHS standards within the industry.

Moving forward, it is imperative for stakeholders, including construction firms, regulatory agencies, industry associations, and government bodies, to collaborate effectively in addressing the identified gaps and implementing evidence-based interventions. Prioritizing OHS training, strengthening enforcement mechanisms, improving access to safety equipment, and fostering communication and collaboration are essential steps in promoting a culture of safety and ensuring the well-being of construction workers.

Ultimately, the success of these initiatives hinges on the collective commitment and concerted efforts of all

stakeholders involved. By prioritizing occupational health and safety, the Nigerian construction industry can not only protect the lives and well-being of its workforce but also enhance productivity, sustainability, and reputation in the long run. Together, we can build a safer and healthier future for construction workers in Nigeria.

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