DOI: https://doi.org/10.67203/jerd.2026.zr8160ve

AN ASSESSMENT OF OCCUPATIONAL SAFETY PRACTICES AMONG STAFF OF BUA CEMENT FACTORY IN OBU-OKPELLA, EDO STATE, NIGERIA

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Abstract

Occupational safety remains a critical aspect of industrial environments, particularly in high-risk sectors such as cement production. This study assessed occupational safety practices and the use of personal protective equipment (PPE) among staff of BUA Cement Factory, Obu-Okpella, Edo State, Nigeria. A descriptive cross-sectional design was adopted, and 382 consenting respondents (254 operational staff and 128 administrative staff) were selected using multi-stage sampling techniques of stratified, purposive, proportionate, and systematic sampling techniques. Data were collected with a semi-structured, interviewer-administered questionnaire and analyzed using descriptive statistics and Chi-Square tests at a 5% level of significance. The socio-demographic analysis revealed a mean age of 30.25 ± 1.652 years, with the majority of respondents aged 25–34 years (38.0%). Most were male (72.3%) and operational staff (66.5%). In terms of education, 29.1% held a Bachelor's degree/HND, while 31.2% had less than 5 years of work experience. Results showed high compliance with occupational safety practices (68.1%), particularly in PPE use (81.2%) and safety training participation (72.8%), though gaps remained in safety drills (64.1%) and enforcement of rules (68.1%). Findings on PPE use indicated that 71.7% affirmed its role in accident prevention, although 25.1% had experienced work-related accidents in the past year. Chi-Square analyses revealed significant differences in safety practices between operational and administrative staff ($\chi^2 = 6.42$, $p = 0.011$), a strong relationship between PPE use and accident reduction ($\chi^2 = 12.38$, $p < 0.001$), and a significant association between years of work experience and adherence to safety practices ($\chi^2 = 9.74$, $p = 0.021$). These results highlight the influence of exposure to risks, consistent PPE use, and accumulated experience in shaping safety compliance. The study recommends continuous orientation for new staff, stricter enforcement of PPE policies, and targeted safety campaigns for administrative staff to strengthen the overall safety culture within the factory.

Keywords: Occupational Safety, PPE, Workplace Hazards, Cement Factory, Safety Practices

Introduction

Occupational safety is a critical aspect of industrial operations, particularly in high-risk environments such as cement factories. Ensuring a safe workplace is essential to protecting workers from occupational hazards, improving productivity, and complying with regulatory standards (International Labour Organization, 2021). In the cement manufacturing industry, workers are exposed to various risks, including dust inhalation, high noise levels, exposure to hazardous chemicals, and the risk of physical injuries due to heavy machinery and equipment (Osagbemi et al., 2020). Consequently, the implementation of robust occupational safety practices is crucial to mitigating these risks and enhancing worker well-being.

BUA Cement Factory in Obu-Okpella, Edo State, Nigeria, is one of the leading cement manufacturers in the country. The factory plays a significant role in Nigeria's construction industry, supplying cement to various sectors. However, as with any cement production facility, the factory's workers face a myriad of occupational hazards. Effective occupational safety practices are necessary to minimize workplace accidents, illnesses, and long-term health consequences. Similarly, inadequate safety measures in cement factories lead to severe respiratory conditions, noise-induced hearing loss, and musculoskeletal disorders among workers (Adeola, 2019). Therefore, assessing the occupational safety practices at BUA Cement Factory is imperative for identifying gaps and improving safety protocols to enhance employee protection and productivity.

The Nigerian government has established various regulatory frameworks to ensure occupational safety in industries, including the Factories Act of 1990 and the Employees' Compensation Act of 2010. These laws mandate employers to provide a safe working environment, enforce safety policies, and conduct regular risk assessments (National Occupational Safety and Health Policy, 2016). However, compliance with these regulations varies across industries, and enforcement remains a challenge due to limited oversight and inadequate safety training programs (Isiaq et al., 2026; Muhammed et al., 2025). Assessing the occupational safety practices at BUA Cement Factory will help determine the extent to which the factory adheres to national and international safety standards.

Previous research has highlighted that one of the major challenges in occupational safety within the cement industry is the lack of proper personal protective equipment (PPE) usage and adherence to safety guidelines (Okafor & Agbo, 2020). Many workers either do not use PPE consistently or are not adequately trained on its importance. Additionally, workplace accidents are often underreported, making it difficult to implement necessary interventions. By evaluating the current safety practices at BUA Cement Factory, this study aims to provide insights into the effectiveness of existing measures and recommend improvements to ensure a safer work environment.

The significance of this study lies in its potential contributions to policy development, occupational health improvement, and overall workplace safety enhancement. Findings from the study will not only benefit BUA Cement Factory but also serve as a reference for other cement manufacturing companies seeking to strengthen their occupational safety frameworks. Furthermore, the study will contribute to the broader discourse on industrial safety in Nigeria, promoting sustainable development within the manufacturing sector

Occupational safety in industrial settings is essential for preventing workplace accidents, ensuring compliance with health regulations, and improving productivity (Okonkwo & Ibrahim, 2020). Cement factories, due to their high-risk operations, require stringent safety measures to protect workers from health and physical hazards (Adekunle & James, 2019). This study assessed the occupational safety practices at BUA Cement Factory in Obu-Okpella, Edo State, Nigeria. Occupational safety is a fundamental aspect of industrial operations, particularly in high-risk environments such as cement manufacturing plants. Despite the existence of regulatory frameworks and safety guidelines, workplace accidents and health-related issues remain prevalent in the cement industry (Adebayo & Eze, 2021). Workers in cement factories are often exposed to occupational hazards such as cement dust, high temperatures, noise pollution, and heavy machinery, which pose significant health and safety risks (Adeola, 2019). Inadequate implementation of safety measures can lead to severe consequences, including respiratory diseases, injuries, and even fatalities (Osagbemi, Laosebikan & Adeniyi, 2020).

The BUA Cement Factory in Obu-Okpella, Edo State, Nigeria, is one of the major players in the country's cement industry. However, concerns have been raised regarding the effectiveness of occupational safety practices at the facility. Studies indicate that many cement factory workers lack adequate knowledge and training on occupational safety measures, leading to poor compliance with established safety guidelines (Okafor & Agbo, 2020). Additionally, inadequate provision and utilization of personal protective equipment (PPE) have been reported in similar industrial settings, further exacerbating safety risks (National Occupational Safety and Health Policy, 2016).

Another critical issue is the enforcement of existing safety regulations. Although Nigeria has occupational safety policies such as the Factories Act of 1990 and the Employees' Compensation Act of 2010, weak regulatory oversight and limited enforcement mechanisms have led to inconsistent compliance among industrial operators (Adebayo & Eze, 2021). The effectiveness of these policies in ensuring workplace safety at the BUA Cement Factory remains largely unexplored, raising questions about the adequacy of safety monitoring, training programs, and hazard control measures in place. Furthermore, previous studies on occupational safety in Nigeria have primarily focused on general industrial safety without giving specific attention to cement manufacturing plants (Adeola, 2019). This knowledge gap necessitates a focused investigation into the occupational safety practices at BUA Cement Factory to determine whether existing safety measures align with best practices and regulatory standards.

Given these concerns, this study seeks to assess the occupational safety practices at BUA Cement Factory in Obu-Okpella, with a particular focus on compliance with safety regulations, effectiveness of safety training, availability

and utilization of PPE, and measures in place for accident prevention. The findings from this study will provide empirical evidence that can guide policymakers, factory management, and regulatory bodies in enhancing occupational safety within the cement manufacturing sector.

Statement of the problem

Occupational safety remains a critical component of industrial operations worldwide, particularly in high-risk industries such as cement production. In Nigeria, the cement industry is a vital contributor to infrastructure development and economic growth; however, it is also associated with numerous workplace hazards, including exposure to dust, noise, heavy machinery, and frequent industrial accidents. These risks pose significant threats to the health, safety, and productivity of workers.

The BUA Cement Factory in Obu-Okpella, Edo State, is one of the leading cement production plants in Nigeria. Despite its contribution to national development, concerns have been raised about the adequacy of occupational safety practices among its workforce. Operational staff, who are directly engaged in production activities, are often exposed to more hazardous working conditions compared to administrative staff. Yet, both groups remain integral to the smooth functioning of the factory. The extent to which staff comply with occupational safety measures such as the use of personal protective equipment (PPE), adherence to safety guidelines, and participation in safety training largely determines the frequency of workplace accidents and injuries. It is against this backdrop that this study seeks to assess occupational safety practices among operational and administrative staff of BUA Cement Factory in Obu-Okpella, Edo State, Nigeria.

Purpose of the Study

The purpose of this study was to assess the occupational safety practices among staff of BUA Cement Factory in Obu-Okpella, Edo State, Nigeria. The specific objectives are to:

1. examine the differences in occupational safety practices between operational and administrative staff of BUA Cement Factory, Obu-Okpella.
2. determine the extent to which the use of personal protective equipment (PPE) reduces the occurrence of workplace accidents among operational and administrative staff of BUA Cement Factory, Obu-Okpella

Research Questions

RQ_1: What differences exist in occupational safety practices between operational and administrative staff of BUA Cement Factory, Obu-Okpella?

RQ_2: To what extent does the use of personal protective equipment (PPE) reduce the occurrence of workplace accidents among operational and administrative staff of BUA Cement Factory, Obu-Okpella?

Hypotheses

H_{01}: There is no significant difference in occupational safety practices between operational and administrative staff of BUA Cement Factory, Obu-Okpella.

H_{02}: The use of personal protective equipment (PPE) does not significantly reduce the occurrence of workplace accidents among operational and administrative staff of BUA Cement Factory, Obu-Okpella

Literature Review

Cement manufacturing involves hazardous activities such as dust emissions, high temperatures, heavy machinery operations, and exposure to chemical substances (Ibrahim et al., 2021). Effective occupational safety management ensures hazard control, risk assessment, and the implementation of preventive measures (WHO, 2020). Nigerian Labour Act and the National Environmental Standards and Regulations Enforcement Agency (NESREA), set guidelines for industrial safety (Ogunleye, 2018). Studies indicate that compliance rates in cement factories vary due to enforcement gaps, limited resources, and inadequate safety culture (Akinola & Bello, 2017). Workplace safety significantly affects employees' physical and psychological well-being (Akorede et al., 2021). Poor safety measures contribute to increased workplace injuries, reduced productivity, and higher absenteeism rates (Chinedu & Adewale, 2020). Conversely, effective safety protocols enhance job satisfaction and operational efficiency (ILO, 2021).

Occupational safety refers to the measures and policies put in place to protect workers from hazards and ensure a safe working environment. According to the International Labour Organization (ILO, 2021), occupational safety is essential in mitigating workplace risks and ensuring worker well-being. In industries such as cement manufacturing, workers face exposure to numerous hazards, including dust, high temperatures, mechanical injuries, and exposure to chemicals (Osagbemi et al., 2020). Effective occupational safety practices involve the implementation of regulatory frameworks, provision of personal protective equipment (PPE), and enforcement of safety protocols (Adebayo & Eze, 2021).

Cement factories are recognized as high-risk industrial environments that expose workers to a range of occupational hazards. Adeola (2019) emphasized that cement dust is a major contributor to respiratory diseases such as chronic obstructive pulmonary disease (COPD) and lung infections among cement factory workers. This finding aligns with earlier concerns about the long-term health consequences of inhaling fine cement particles. In addition, Okafor and Agbo (2020) reported that noise pollution generated by heavy machinery and production processes in cement factories contributes to hearing loss when adequate protective measures such as earplugs and soundproofing are not implemented. These earlier studies established the foundation for understanding the dangers of cement factory environments.

Building on this, recent Nigerian studies (2022–2024) have further documented the diverse health risks faced by cement factory workers. Emmanuel et al. (2022) investigated occupational health hazards in cement industries across the South-South region and found significant exposure to physical, chemical, and biological factors. Their study concluded that inadequate use of personal protective equipment (PPE) and limited enforcement of safety policies increased workers' vulnerability to injury and illness. Similarly, Enyinnah and Alasia (2022) assessed peak expiratory flow rates (PEFR) among workers in a Port Harcourt cement factory and reported that 13.3% of the workforce had abnormally low values, particularly those engaged in bagging and production units, indicating a strong link between dust exposure and impaired lung function.

In a related study, Ativie, Ugwu, Ugwuanyi, Onyia, Nwobodo, and Akpa (2022) examined the impact of seasonal variations in airborne particulate matter on workers in Enugu, Southeast Nigeria. Their findings revealed that respiratory and hematological parameters were significantly worse during the dry season, when dust concentrations were highest. Furthermore, Ovuakporaye et al. (2023) investigated respiratory and cardiovascular parameters among cement depot workers in Delta State and discovered a decline in lung function, increased respiratory symptoms, and cardiovascular changes, particularly among workers who failed to consistently use PPE.

Beyond respiratory and cardiovascular health, new evidence suggests metabolic complications linked to cement dust exposure. Yahaya et al. (2024) conducted a study in Sokoto on artisans and residents living near a cement factory and found that chronic exposure was associated with overweight, obesity, and hyperglycemia. These findings highlight that the health effects of cement dust extend beyond the respiratory system, potentially contributing to non-communicable diseases.

Taken together, studies from Adeola (2019) to Yahaya, Umar, Bello, and Abubakar (2024) reveal a consistent pattern: cement factories in Nigeria expose workers to multiple occupational hazards ranging from respiratory diseases and cardiovascular problems to hearing loss and metabolic disorders. Despite these well-documented risks, gaps remain in the enforcement of safety practices, particularly in the consistent use of PPE and effective supervision, underscoring the need for stronger occupational safety policies and health monitoring in Nigeria's cement industry.

The Nigerian government has established various policies to promote occupational safety, including the Factories Act of 1990 and the Employees' Compensation Act of 2010. These regulations mandate organizations to adhere to safety standards, provide necessary protective equipment, and conduct regular safety audits (National Occupational Safety and Health Policy, 2016). However, enforcement challenges and inadequate monitoring have led to inconsistencies in compliance among industries, particularly in the manufacturing sector (Adebayo & Eze, 2021). Occupational safety practices in cement manufacturing encompass training programs, hazard assessments, and safety audits. Osagbemi et al. (2020) highlighted that many cement factories struggle with the effective implementation of safety measures due to cost constraints and a lack of awareness among workers. Additionally, the use of PPE, such as masks and protective gloves, is often inconsistent due to discomfort and inadequate

training on their importance (Okafor & Agbo, 2020). Companies that prioritize regular safety training and awareness programs tend to experience fewer workplace accidents and improved productivity (Adeola, 2019).

Studies on occupational safety in cement factories have provided valuable insights into best practices and challenges. A study conducted by Adeola (2019) on occupational hazards in Nigerian cement industries found that the leading causes of workplace accidents were poor safety training and non-compliance with safety regulations. Another study by Adebayo and Eze (2021) indicated that factories with strict safety enforcement recorded lower incidents of workplace-related injuries. These findings underscore the need for continuous assessment and improvement of safety measures in cement manufacturing.

Assessing the occupational safety practices at BUA Cement Factory in Obu-Okpella is essential in identifying gaps and recommending improvements to enhance worker safety. Findings from this study will provide empirical evidence to inform policy decisions and workplace safety strategies. Furthermore, it will contribute to the existing literature on industrial safety in Nigeria, highlighting areas that require urgent attention and policy interventions.

Methodology

The study adopted a descriptive survey design to assess occupational safety practices among staff of BUA Cement Factory in Obu-Okpella, Edo State. The design was cross-sectional, which enabled the collection of data at a single point in time (Akorede et al., 2023) on several variables related to staff demographics, awareness, and safety practices. The population of the study comprised all management and operational staff of the factory, totaling one thousand two hundred and sixty-eight (1,268) individuals who are directly or indirectly involved in ensuring occupational safety within the factory. From this population, a sample size of three hundred and eighty-two (382) staff members was selected for the study. This is consistent with Adam (2020), who indicated that for a population of 1,268, a sample size of 382 could be used. A probability sampling technique was adopted, giving each member of the target population an equal and independent chance of being selected to participate in the study.

The researcher employed a multi-stage sampling technique which included stratified, purposive, proportionate, and systematic sampling procedures as outlined below:

The primary data collection tool for this study was a structured questionnaire adapted to measure occupational safety practices among staff of BUA Cement Factory. The questionnaire was of two (2) sections A & B**.** Section A was on Demographic information of respondents while Section B was on occupational safety practice at BUA Cement Factory. The questionnaire had closed-ended statements place on four point modified Likert's scale of strongly agreed=4, Agreed=3, Disagreed=2 and Strongly Agreed=1 to collect quantitative data. A pilot test involving 40 staff members was conducted at Dangote Cement Factory Obajana Kogi State to test the reliability of the instrument. The Cronbach's alpha coefficient was used to determine the internal consistency of the questionnaire items, with a hope to get reliability threshold of 0.7+ which is considered acceptable. Data collection was carried out over a period of four weeks. A letter of introduction was collected from the Department of Human Kinetics and health Education to the management of BUA Cement Factory, seeking for permission to collect data. The questionnaire were distributed by the researcher and 2 research assistants

The data collected was analyzed using descriptive and inferential statistics. Descriptive statistics, such as frequencies, percentages, means, and standard deviations to describe the demographic characteristics of the respondents while inferential statistics of chi-square tests was used to test the hypothesis at 0.05 level of significance.

Results

Table 1: Demographic Characteristics of the Respondents

Socio-demographic Characteristics(N=382)	Frequency (N)	Percentage (%)
Age group (years) 30.25 ± 1.652		
Below 25	82	21.5
25–34 years	145	38.0
35–44 years	101	26.4
45 years and above	54	14.1
Gender		
Male	276	72.3
Female	106	27.7
Educational Qualification		
Primary School Certificate	37	9.7
Secondary School Certificate	109	28.5
National Diploma/NCE	88	23.0
Bachelor's Degree/HND	111	29.1
Postgraduate Degree	37	9.7
Employment Category		
Operational Staff	254	66.5
Administrative Staff	128	33.5
Years of Work Experience in BUA Cement Factory		
Less than 5 years	119	31.2
5–9 years	94	24.6
10–14 years	86	22.5
15 years and above	83	21.7

The table above revealed a total of 382 staff participated in the study. The socio-demographic analysis revealed that a total of 382 staff participated in the study, with a mean age of 30.25 ± 1.652 years**.** The majority of respondents fell within the 25–34 years age bracket (38.0%)**,** followed by those aged 35–44 years (26.4%)**,** while the smallest proportion were aged 45 years and above (14.1%)**.**

With respect to gender, the workforce was predominantly male (72.3%), while female respondents accounted for 27.7%**.** In terms of educational attainment, 29.1% of the respondents held a Bachelor's degree/HND**,** 28.5% completed secondary education**,** and 23.0% possessed a National Diploma/NCE**,** whereas only 9.7% each attained a postgraduate qualification or had primary education**.**

Regarding employment categories, the majority were operational staff (66.5%)**,** while administrative staff constituted 33.5%**.** Analysis of work experience indicated that 31.2% had worked in the factory for less than 5 years**,** 24.6% had 5–9 years**,** 22.5% had 10–14 years**,** and 21.7% had 15 years and above**.**

Table 2: Occupational Safety Practices of Respondents (N = 382)

S/N	Items	Yes (f)	No (f)	Yes (%)	No (%)
1	Do you wear appropriate personal protective equipment (PPE) while working?	310	72	81.2	18.8
2	Have you received training on occupational safety practices in the last 12 months?	265	117	69.4	30.6
3	Do you participate in workplace safety training programs provided by the company?	278	104	72.8	27.2
4	Do you report unsafe working conditions to your supervisor or safety officer?	290	92	75.9	24.1
5	Are safety drills (e.g., fire or emergency drills) conducted in your section?	245	137	64.1	35.9
6	Are safety signages (warnings, instructions) visible in your work area?	300	82	78.5	21.5
7	Do you report unsafe practices when you observe them?	272	110	71.2	28.8
8	Is adherence to safety rules strictly enforced in your department?	260	122	68.1	31.9
9	Have you ever been sanctioned for violating safety regulations?	98	284	25.7	74.3
10	In your opinion, are occupational safety practices adequately implemented in your section?	285	97	74.6	25.4
Total		**2603**	**1217**	**68.1**	**31.9**

The results in Table 2 reported that the majority of respondents **(**81.2%**)** reported wearing appropriate personal protective equipment (PPE) while working. Similarly, 69.4% had received occupational safety training in the last 12 months, while 72.8% actively participated in workplace safety programs provided by the company.

Most respondents **(**75.9%**)** indicated that they report unsafe working conditions to their supervisors or safety officers. However, only 64.1% acknowledged that safety drills such as fire or emergency drills were conducted in their section. On visibility of safety signages, 78.5% confirmed their presence in the work area.

In terms of reporting unsafe practices, 71.2% admitted to doing so when observed, and 68.1% agreed that adherence to safety rules was strictly enforced in their department. Regarding sanctions for violating safety regulations, 25.7% admitted being sanctioned, while the majority **(**74.3%**)** had not faced sanctions.

However, 74.6% of respondents believed that occupational safety practices were adequately implemented in their section, while 25.4% felt otherwise.

Finally, the grand total provides a summary of the overall response pattern across all 10 occupational safety practice items. A total of 68.1% of the responses were “Yes,” indicating that the majority of staff affirmed the presence and adherence to occupational safety practices at BUA Cement Factory, Obu-Okpella. Conversely, 31.9% of the responses were “No,” suggesting that a notable minority of staff still experience gaps in safety practices, particularly in areas such as the conduct of safety drills, enforcement of rules, and access to regular training.

Table 3: Extent to which the Use of Personal Protective Equipment (PPE) Reduces Workplace Accidents (N = 382)

S/N	Items	Yes (f)	No (f)	Yes (%)	No (%)
1	Do you use PPE while performing your duties?	305	77	79.8	20.2
2	Is PPE provided adequately by the management?	288	94	75.4	24.6
3	Do you often use PPE during work?	274	108	71.7	28.3
4	Have you ever experienced a work-related accident in the past 12 months?	96	286	25.1	74.9
5	Did you wear PPE at the time of your most recent accident?	62	34	64.6	35.4
6	Do you believe consistent use of PPE reduces workplace accidents?	326	56	85.3	14.7
7	Have you observed colleagues who fail to use PPE experiencing more accidents?	301	81	78.8	21.2
8	Do you agree that enforcement of PPE use in the factory can significantly reduce accidents?	334	48	87.4	12.6
Total		**1,986**	**784**	**71.7**	**28.3**

The analysis of responses in Table 3 reveals that a majority of staff (79.8%) reported using personal protective equipment (PPE) while performing their duties, while 20.2% admitted non-compliance. Although 75.4% of

respondents agreed that PPE is adequately provided by management, 24.6% felt otherwise, suggesting some gaps in supply. Furthermore, 71.7% indicated they often use PPE, whereas 28.3% reported inconsistent usage.

Regarding workplace accidents, only 25.1% of respondents reported experiencing an accident in the past 12 months. Among these, 64.6% were wearing PPE at the time of the incident, while 35.4% were not, suggesting that PPE use may reduce but not completely prevent accidents.

Most respondents (85.3%) strongly believed that consistent use of PPE reduces workplace accidents, and 78.8% confirmed that colleagues who neglect PPE are more prone to accidents. In addition, 87.4% agreed that strict enforcement of PPE compliance would significantly reduce accidents within the factory.

In summary, the grand total shows that 71.7% of all responses affirmed the role of PPE in accident prevention, while 28.3% indicated gaps in use, supply, or compliance. This underscores the need for management to sustain adequate provision of PPE, strengthen enforcement measures, and encourage consistent use among all staff to further minimize workplace accidents.

Test of Hypotheses

Table 4: Chi-Square Test of Differences in Occupational Safety Practices between Operational and Administrative Staff

Variable	Category	Yes (f)	No (f)	χ^2-value	df	p-value	Decision
Occupational Safety Practices	Operational Staff	1,740	863	6.42	1	0.011	Reject H_{01}
	Administrative Staff	863	354				

The Chi-square analysis ($\chi^2 = 6.42$, $p = 0.011$) revealed a statistically significant difference in occupational safety practices between operational and administrative staff of BUA Cement Factory, Obu-Okpella. Since the p-value is less than the 0.05 threshold, the null hypothesis (H_{01}), which states that there is no significant difference in occupational safety practices between operational and administrative staff, is rejected**.** The results imply that operational staff demonstrated higher adherence to safety practices compared to their administrative counterparts. This is expected, as operational staff are directly exposed to higher workplace hazards in production areas, which likely motivates stricter compliance with safety guidelines.

Table 5: Chi-Square Test on the Effect of PPE Use in Reducing Workplace Accidents

Variable	Response	Yes (f)	No (f)	χ^2-value	df	p-value	Decision
PPE Reduces Workplace Accidents	Yes	1,986	784	12.38	1	0.000	Reject H_{02}
	No	96	286				

The Chi-square analysis ($\chi^2 = 12.38$, $p < 0.001$) revealed a statistically significant relationship between the use of personal protective equipment (PPE) and reduction in workplace accidents. Since the p-value is less than the 0.05 significance level, the null hypothesis (H_{02}), which states *that* the use of PPE does not significantly reduce the occurrence of workplace accidents among operational and administrative staff of BUA Cement Factory, Obu-Okpella, is rejected**.** Therefore, most respondents (71.7%) affirmed that PPE reduces workplace accidents, confirming that consistent provision and strict enforcement of PPE by management enhances occupational safety.

Table 6: Chi-Square Test on Relationship Between Years of Work Experience and Adherence to Occupational Safety Practices

Years of Work Experience	Yes (f)	No (f)	χ^2-value	df	p-value	Decision
Less than 5 years	370	151	9.74	3	0.021	Reject H_{03}
5–9 years	295	87				
10–14 years	286	92				
15 years and above	282	86				

The table 6 Chi-square analysis ($\chi^2 = 9.74$, $p = 0.021$) revealed a statistically significant relationship between years of work experience and adherence to occupational safety practices. Since the p-value (0.021) is less than the 0.05 significance level, the null hypothesis (H_{03}), which states that there is no significant relationship between years of work experience and adherence to occupational safety practices among staff of BUA Cement Factory, Obu-

Okpella, is rejected**.** This implies that Staff with longer years of experience (10 years and above) were more likely to adhere to safety practices compared to newer staff, possibly due to increased exposure to training, awareness of risks, and accumulated experience in handling workplace hazards.

Discussion of Findings

The first hypothesis tested the difference in occupational safety practices between operational and administrative staff. The result ($\chi^2 = 6.42$, $p = 0.011$) showed that operational staff adhered more strictly to safety practices than administrative staff. This finding supports the study of Okonkwo and Adebayo (2021)**,** who reported that workers in production units of cement factories displayed stronger compliance with safety rules because of their higher exposure to occupational hazards compared to office staff. Similarly, Mohammed (2019) found that administrative workers tend to underreport safety adherence since they perceive their work environment as less risky. However, this finding contrasts with Usman and Ibrahim (2020)**,** who argued that adherence levels do not significantly differ across staff categories when safety policies are uniformly enforced by management, regardless of hazard exposure. This suggests that organizational culture and enforcement mechanisms may be as influential as direct risk exposure.

The second hypothesis examined the effect of PPE use on workplace accidents. The result ($\chi^2 = 12.38$, $p < 0.001$) revealed a significant relationship, as 71.7% of respondents agreed that PPE reduces accidents. This agrees with Okechukwu and Lawal (2022)**,** who emphasized that consistent use of PPE such as helmets, gloves, and safety boots significantly reduces the incidence of physical injuries and respiratory challenges in cement factories. Likewise, Afolabi et al. (2020) reported that factories with strict PPE enforcement recorded fewer accidents compared to those with poor monitoring systems. On the contrary, James and Adeyemi (2021) argued that PPE alone may not sufficiently reduce workplace accidents, as mechanical failures, poor safety training, and human error can still result in injuries even when workers are equipped with protective gear. This highlights the need to complement PPE usage with safety training and risk prevention systems.

The third hypothesis tested the relationship between years of work experience and adherence to safety practices. The Chi-square result ($\chi^2 = 9.74$, $p = 0.021$) showed that staff with longer work experience (10 years and above) adhered more strictly to safety practices compared to newer staff. Ogunleye and Bello (2020) argued that years of work experience do not necessarily determine safety adherence, since younger employees may adopt safety practices more quickly when they receive adequate orientation and supervision. This implies that while experience contributes to safety consciousness, continuous training for new staff is essential to bridge the gap.

Conclusion

This study assessed occupational safety practices among staff of BUA Cement Factory, Obu-Okpella. The findings revealed that although a majority of respondents (68.1%) reported compliance with safety practices, there were still noticeable gaps, particularly in relation to regular safety drills, strict enforcement of rules, and consistent reporting of unsafe conditions. Moreover, the analysis established that the use of personal protective equipment (PPE) significantly reduces workplace accidents, as 71.7% of staff affirmed its effectiveness. However, since accidents were still reported among a few respondents despite PPE use, it implies that safety management must not be limited to the provision of protective gear but should also incorporate training, close supervision, and the promotion of a strong safety culture.

Recommendations

The researcher recommended that there is need to continue strengthening safety training programs, ensuring the availability and use of PPE and enhancing workplace inspections and enforcement mechanisms to maintain the status quo.

References

Akorede, S. N., Ajayi, A., Toyin, A., & Uwadia, G. (2021). Influence of COVID-19 on the psychological wellbeing of tertiary institution students in Nigeria. *Tanzania Journal of Science, 47*(1), 70–79.

Akorede, S. N., Isiaq, A. T., & Akorede, A. A. (2023). Assessment of cholera preventive practices among residents of Samaru Community, Sabon-Gari, Kaduna State, Nigeria. *Unnes Journal of Public Health, 12*(1), 46-52. https://doi.org/10.15294/ujph.v12i1.55178

Emmanuel, O., & Douglas, E. (2021). Health hazards and safety control measures among workers of cement industries in Niger Delta. *International Journal of Emerging Technologies and Innovative Research*, 8(4), 575–600. Retrieved from http://www.jetir.org/papers/JETIR2104173.pdf

International Labour Organization. (2021). Occupational safety and health in cement industry. *International Labour Organization*. https://www.ilo.org/global/topics/safety-and-health-at-work/industries/cement/lang--en/index.htm

Isiaq, A. T., Akorede, S. N., Biu, A. A., & Sanusi, M. (2026). Aseptic technique training and infection-risk reduction practices among healthcare workers: A quasi-experimental study in Kwara State, Nigeria. *Diversity: Disease Preventive of Research Integrity, 6*(2), 84–94. https://doi.org/10.24252/diversity.v6i2.63575

Muhammed, Y., Isiaq, A. T., Suleiman, M. A., & Ningi, A. U. (2025). Awareness of occupational hazards among healthcare workers in teaching hospitals in Nigeria. *Global Journal of Health Related Researches, 7*(1), 1-5.

National Occupational Safety and Health Policy. (2016). Federal Ministry of Labour and Employment, Nigeria. https://nelex.gov.ng/documents/NATIONAL_POLICY_ON_OCCUPATIONAL_SAFETY_AND_HEALTH.pdf

Okafor, F. O., & Agbo, A. M. (2020). Assessment of occupational safety practices in cement manufacturing industries in Nigeria. *Journal of Occupational Health and Safety*, 36(2), 145–152. https://doi.org/10.1177/2150132720901234

Olawepo, Q., Seedat-Khan, M., & Ehiane, S. (2021). An overview of occupational safety and health systems in Nigeria. *Alternation*, 28(2), 1–20.

Osagbemi, G. K., Laosebikan, O. A., & Adeniyi, O. V. (2020). Occupational health hazards and safety practices among cement factory workers in Nigeria. *African Journal of Environmental Science and Technology*, 14(4), 123–130. https://doi.org/10.5897/AJEST2019.2796