

An Evaluation of the Factors Affecting the Effective Use of Safety Wears on Construction Site in North Western Nigeria.

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ABSTRACT: The construction industry poses great hazard to the health and safety of workers, visitors and activities on construction sites, in spite of its importance on the national economy. The study addressed the problem of insufficient understanding of how the factors affect the effective use of safety wears on construction sites, with a view to determining the most prioritise factors that affect the use of safety wears, so that if addressed appropriately it will go along way in improving safety of workers on site. The questionnaires were administered to 140 randomly selected construction firms, 89 copies were returned and analyzed justifying 68% response rate. The study identified Five top ranked factors preventing site operatives from effective use of safety wears out of thirteen listed factors include: Inadequate engagement of Safety Managers and ineffective supervision, Insufficient instructions about the working condition and environment, Lack of proper knowledge on the hazards management, Operatives' engagement in improper conduct that could endanger their safety, and Carelessness and over-confidence of workers. This study concluded that Construction firms should create adequate awareness, through safety meetings/inductions, to educate workers on the implementation of the important health and safety practices/wears and hazards management for improved health and safety performance.

I. INTRODUCTION

Construction industry has been considered most risky of all industries in terms of health and safety consideration. Death tolls, permanent disability and severe environmental threat had been on the increase through collapse of buildings and other operational accidents [23]. Work related

hazard is not a new phenomenon but its frequent occurrence on sites remains a major setback towards successful projects delivery [18].

Construction industry is associated with vital contributions to national economic development through strategic planning, design, and construction in transforming various production processes into constructed facilities [18]. [11], [26]. Categorises Nigeria Construction companies to majorly two categories: multinational construction companies and indigenous construction companies. The are known to be Nigerian owned firms, whose establishment and man power resources are relatively sourced for in Nigeria and their strength determine the level of its operation in terms of project capacity and they are mainly seen as medium and small size firms [26].

However, indigenous construction companies still represent one of the most dynamic and risky business in Nigeria because safety practices has not been given proper consideration [18]. In appropriate use of safety wears has been identified as one of the major course of accident. [18] conducted a research on the factors affecting the use of safety wears by the workers in construction sites of southwestern geopolitical zone of Nigeria but the findings cannot be generalised as it doesn't cover other part of the country. This paper investigates and prioritized factors responsible for ineffective use of safety wears by construction workers in north central Nigeria.

II. LITERATURE REVIEW

The construction industry of developing countries and indeed Nigeria is dominated by small and medium-sized construction companies (construction SMEs) identified with poor health

and safety performance [2], [6], [7], [11], [16]. This is because they lack the managerial and technical skills and sophistication enjoyed by larger companies. Measures taken to eliminate health and safety hazards by the construction SMEs are therefore unsatisfactory [9]. The construction industry has been identified as the most risky and hazardous of all industries in terms of health and safety because its activities pose serious health and safety risks to workers, users of construction facilities and the public [11]. It has been found out that 25 – 40% of fatalities in the global occupational environment are contributed by construction – related activities [12], [13]. According to [4], management policy, especially in developing economies is yet to properly address the issue of employee health and safety. This has resulted in frequent accidents and hazards, leading to high costs in hospital bills, salaries for hospitalised workers and compensations to victims. Increased labour turnover, absenteeism, strained management-labour relationship; operational inefficiency and ultimately, decreasing performance become noticeable in such organisations. [4] opined that the problem of health and safety in the workshop, sites, built facilities and the field in Nigeria cannot be overemphasised. Hence, careless attitudes, overconfidence and failure to provide health and safety measures and periodic health and safety seminar for the stake holders and general public triggers a high risk of accidents in the construction industry.

[21] opined that inadequate compliance with health and safety rules on project sites were due to low level of supervision of construction workers. [26] noticed that health and safety practices in Nigeria is ineffective and lacks proper documentation when compared with the international standards. [17] stated that site workers embraced safety training in enhancing workers performances and reduced accidents on site. [25] established that insufficient knowledge on safety education has limited Safety Managers ability to coordinate safety practices and develop Safety Policy for the management of building production processes. [3] established high level of awareness on the importance of Occupational Safety but there was inadequate investment made towards enhancing workers capacity development on safety programmes in majority of the construction companies. However, [25] argued that safety awareness and compliance among the sites operatives was at infant level and this has caused low project performance.

Safety practice of indigenous companies remained an issue of concern in the Nigerian

construction industry. Violation of safety rules seems to be a predominant practice and common phenomenon of indigenous construction companies while workers are trying to make work faster because most construction managers place more value on productivity than safety [8]. [28] stated that in Canada, projects that involve appointment of resident Safety Manager have better safety performance records than others without Safety Managers because they ensure that both human and materials resources are managed effectively on site. [24] listed out the following usual practices of construction workers on sites in Nigeria, they include: working bare footed, use of bamboo scaffolds, hand mixing of concrete without protective wears as some of the unsafe practices among workers. [1] revealed that contractors in South Western Nigeria have implemented safety policy that covers safety briefing and also uses audio, video and print media in communicating safety information to operatives on sites. However, area such as engaging resident Safety Manager on construction sites; training of the new staff on the related jobs and the use of tools and equipment site; reward workers that exhibit excellent safety performances; testing the competence of the skilled labour and their adaptability to working environment; availability of the internal and external health and safety department; setting safety guidelines into the body of conditions of contract were less implemented.

Several authors worked on health and safety management on construction site, but adequate consideration have not be given to proactive measures of effective use of safety wears on workers wellbeing [2]. This is due to its active role of modifying the behaviour of workers which will reluctantly yield a greater influence towards improving safety behaviour [20]. Many factors have been considered why workers lack effective use of safety wears, though the cause of occupational accidents have been classified into unsafe conditions and unsafe behaviour [7]. For example [12] argued that contractors sometime overlook their workers from using safety wears because they perceived that its use could increase time taken by the workers to complete their daily output, which in turn impedes their productivity. The study conducted by [4] found out that most common unsafe acts that frequently occur on construction sites in Thailand is a as failure of workers to use safety wears, improper lifting or handling of materials, and keeping sharp objects in wrong positions. Based on the study conducted by [19] on safety practices on high rise design and construction, the study established that workers

ignorance, negligence, carelessness, over-confidence and workers disregarding proper use of safety wears were the major factors affecting safety practices. [9] opined that, unsafe conditions coupled with the use of improper safety wears contributed to high rate of accidents on construction sites. The outcome of [24] study articulated that, workers are prone to injuries at work setting because of the lack of appropriate approach and right attitude in which contractors disregarded compliance with Occupational Health and Safety (OHS). [28] stated that unemployment have made workers to disregard compliance with safety practices by accepting risky jobs. [17] noted that workers low wages and willingness to accept risky job as a means of survival remained the majors cause of accidents. [22] argued that any attempt to implement health and safety programs on construction site would increase the overall cost of the projects. Further assessment showed that for the past two decades researchers could not established the use of safety wears as part of Artisans apprenticeship, it is a general believe that safety wears were against their traditional training and practices [25]. Hence, [5] proposed that around 81.1% of Nigerian construction Sites labourers didn't use safety wears because they are of opinion that safety wears are either curiously large/undersized or overwhelming. [19] opined that there is skill gaps in Nigerian construction industry, especially Artisans and Craftsmen lacks requisite knowledge, skills and experience required to undertake their tasks competently. He stressed that what most of the Artisan possesses are simple skills that was learnt informally and/or on the-job, and there are gaps between the skills required on the job and the actual skills possessed by the employees. [2] found out that adaptability of workers to safety practices as it was against their traditional training, unethical practices of worker due to human attitudinal peculiarities, insufficient instructions about the working conditions, inadequate and ineffective supervision by Safety Managers on sites, workers unsafe practices due to religious assertions among others.

III. METHODOLOGY

Survey is a structured approach to data collection and analysis that depends on a precise logic. Survey data may be gathered with the use of interviews and questionnaires. Perhaps the most widely used data collection instrument for field survey in researches is questionnaire. Cross-sectional surveys are designed to collect data at one point in time, whereas longitudinal surveys collect data that reflect the time dimension of social life.

This study adopted the cross-sectional survey design.

In order to verify the quality of the questionnaire developed for the study, the questionnaire was pilot-tested (pre-testing) by sending it to ten (10) construction SMEs. A questionnaire can be verified through a pre-testing exercise in order to reveal omissions and questions liable to misinterpretation. The final questionnaire developed had no fundamental changes,

The questionnaire was divided into two sections. The section of the questionnaire contained questions on profiles of construction firms (e.g. experience, position of respondent, type of work the business undertakes, number of employees). The information in this section gave detailed account of the respondents characteristics which is very vital. The second section contained responses on the identified factors preventing effective use of safety wears on construction sites. This section is also essential because it contains fundamental factors that prevents constructions firms from effective use of safety wears on site. The information here was also crucial towards addressing the research problem.

In order to ensure applicability of the findings from this study across the North Western region of Nigeria, it became necessary to have a population that represented the construction firms operating across the region. A list of registered construction firms was obtained from the government establishment saddled with the responsibility of registering and ensuring continuity of construction and other contractors in Nigeria. Sample size for the study was determined using Cochran's (1977) table for determining minimum returned sample size for a given population size study (margin of error = 0.05, alpha level = 0.5). A total sample size of 180 was identified to be sufficient for the study. Therefore, based on the above sample size, 140 copies of questionnaires were administered. 89 copies were returned and analyzed justifying 68% response rate.

3.1 RELIABILITY CHECK

Cooper and Emory (1995) defined the measure of the accuracy and precision of measurement procedure as reliability. The Cronbach's alpha reliability test determines the consistency of the data of a research instrument. The normal range for the determination of the internal consistency of a research instrument is 0.50-0.70 and more as posited by (Binyam et al., 2016). The greater the alpha values, the better the reliability of data. The Cronbach a value was used to test the reliability of measurement scales. As

shown in Table 4.2, the value of Cronbach a of the measurement scale is greater than the cut-off value of 0.7 (Netemeyer et al., 2003), indicating that all of the factors exhibited high internal consistency

and that the questionnaire was thus reliable. Therefore, the measurement scales of the 13 factors are reliable.

TABLE 1. CRONBACH'S ALFA FOR RELIABILITY TEST

SN	Variables Tested	Cronbach's Alpha	N of items
1	What is the status of the effectiveness of improvised safety wears in construction sites	0.865	13

3.2 DATA ANALYSIS, RESULTS AND DISCUSSION

Mean Score was used to rank respondents opinion on factors preventing effective use of safety wears on construction sites. The five-point Linker Scale ranged from 1 (totally disagree) to 5 (highly agree) was adopted where W is the weighting assign to each factor by the respondents ranging from 1 (totally disagree) to 5 (highly agree), HA is the highest weight (i.e. 5 in this regard), and N is the total number of respondents. An independent-samples t-test was adopted to determine the significant of various factors preventing effective use of safety wears.

3.2 General Characteristics of the Respondents

Table 4.1 shows the result of the analysis of the respondents' general characteristics. With regards to their years of experience, 26.4% have less than 0-5 years' experience, 27.9% have 6-10 years' experience, 15.7% have 11-15 years'

experience, and 16.4% have 16-20years while 13.6% have 20 and above years of experience. In terms of Age, 50.7% have 20-30 age' 35.7% have 30-40 age' and 9.3% have 40 and above.

In terms of Academic Qualification, sizeable proportions 39.3% have B.Sc as their highest qualification, 18.6% have HND, and about 21.4% have M.Sc, 15.0% have Phd, and 5.0% have OND. This implies that 100% of the respondents received higher formal education, thereby qualified to be able to provide relevant information for this research. As regards to their profession, Architects constitute 20.7%, 22.1% are Builders, 47.1% are Quantity surveyors and 9.0% are Engineers.

The result from this section shows that the respondents have the requisite academic qualification, industry experience and professional qualification to give reliable information regarding the subject of this research.

Table 2: Demographic characteristics of Respondents

Category	Classification	Freq.	Percent
Years of experience	0 - 5years	37	26.40%
	6-10 years	39	27.90%
	11-15years	22	15.70%
	16-20years	23	16.40%
	20 and above	19	13.6%
	TOTAL	140	100.00%
Age	20-30age	71	50.70%
	30-40age	50	35.7%
	40and above	13	9.3%
	TOTAL	140	100.00%

Academic Qualification			
	HND	26	18.60%
	B.Sc	55	39.30%
	M.Sc	30	21.40%
	PhD	21	15.0%
	OND	8	5.7%
	TOTAL	140	100.00%
Respondents profession			
	Architects	29	20.70%
	Builders	31	22.10%
	Engineers	13	9.30%
	Quantity Surveyors	66	47.10%
	TOTAL	140	100.00%

Source: Researcher’s analysis (2021)

The result from table 4.1 shows that the respondents have the requisite academic qualification, industry experience and professional qualification to give reliable information regarding the subject of this research.

3.3 Analysis of Factors Affecting effective use of Safety Wears on Construction Sites

The analysis of survey response data produced mean importance values for the 49 factors affecting the adoption of BIM, ranging from 3.00 to 4.42. Tables 3 shows that three (3) leading factors scored mean values greater than 4.0, while the remaining 10 factors scored mean value between 3 and 3.9.

The 3 leading factors that affect the effective use of safety wears on construction site

are; Inadequate engagement of Safety Managers and Ineffective Supervision with mean value of 4.4157, Insufficient Instructions about the Working Condition and Environment with mean score of 4.1910 and Lack of proper knowledge on the hazards management with mean value of 4.0000.

The least important overall factors that affect the effective use of safety wears on construction site according to the survey are "Workers inadequate or lack of understanding about the workplace safety rules.", "Safety wears is not comfortable to workwith" and "Willingness of the workers to meet their daily output" with mean score of 3.0000, 3.1910 and 3.3258 respectively.

Table 3: FACTORS AFFECTING USE OF SAFETY WEARS ON CONSTRUCTION SITE

FACTORS	Mean	Std. Deviation	Rank
Inadequate engagement of Safety Managers and ineffective supervision	4.4157	.65382	1
Insufficient instructions about the working condition and environment.	4.1910	.87745	2
Lack of proper knowledge on the hazards management.	4.0000	.63960	3

"Operatives' engagement in improper conduct that could endanger their safety."	3.9101	1.05141	4
Carelessness and over-confidence of workers	3.8989	.95400	5
Lack of proper training on effective use of safety wears.	3.6966	1.11196	6
"Ineffective communication between health and Safety Managers and workers"	3.6966	.78920	6
"Unethical practices of worker due to human attitudinal peculiarities and traditional believes."	3.6854	1.19274	7
"Adaptability of workers to safety practices as it was against the traditional practices."	3.6067	1.02932	8
Unsafe practices of worker due to religious assertions	3.6067	.80648	8
Willingness of the workers to meet their daily output.	3.3258	1.17527	9
Safety wears is not comfortable to workwith	3.1910	1.33890	10
Workers inadequate or lack of understanding about the workplace safety rules.	3.0000	1.27920	11

Source: Researcher's Field survey (2021)

IV. DISCUSSION OF FINDINGS

The study identified Inadequate engagement of Safety Managers and ineffective supervision as the most prioritise factor affecting the adoption of health and safety wears on construction sites where is is ranked first (1). This is inagreement with Ogundipe, Olaniran, Owolabi, Akuete, Olanipekun and Fagbenle (2018) who recommended that in a place where provision are made forhealth and safety policies, a supervisor should beappointed toensure compliancewhere while Several measures and punishmentsshould be meted out to contractors who violate safety policy.

Five top ranked factors preventing site operatives from effective use of safety wears out of thirteen listed factors include: Inadequate engagement of Safety Managers and ineffective supervision, Insufficient instructions about the working condition and environment, Lack of proper knowledge on the hazards management,

Operatives' engagement in improper conduct that could endanger their safety, and Carelessness and over-confidence of workers. All of these factors except one, are within the control of the Safety and Site Managers and if averted they will go a long way in addressing the issues of safety practices.

Workers inadequate or lack of understanding about the workplace safety rules and Safety wears is not comfortable to work with were ranked low as it is against their tradition and practice. It is therefore not surprising workers have problems adapting to safety practices especially the use of safety wears because it is not part of their training and expectations.. This therefore necessitates a determination of favourable conditions for effective implementation of use of safety wears on construction sites.

V. CONCLUSION

The findings of the results discussed in this study can serve as a good foundation for the development of a framework for improving effective use of safety wear on construction site. In order to have a significant improvement in the health and safety performance of construction site and the construction sector as a whole, it is essential to create a sustainable and enabling environment which will enhance the capacity of construction firms to manage their operations in a safe and healthy manner. Constant re-evaluation and safety training should be taken seriously especially on the most vulnerable. Also, the research concludes that for improvements of safety performance on construction sites, channels of communication must be improved on construction sites and safety and site managers should adopt the required site training for the operatives.

Construction firms should create adequate awareness, through safety meetings/inductions, to educate workers on the implementation of the important health and safety practices/wears and hazards management for improved health and safety performance. This is because Lack of proper knowledge on the hazards management. ranked 3rd among the five factors affecting the effective use of safety wears on construction site

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