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Appraisal of Safety Practices on Construction Sites in Ibadan, Oyo State, Nigeria

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ABSTRACT

Safety practices in projects are considered significant to successful project delivery in the construction industry. This research focused on the appraisal of safety practices on construction sites in Ibadan, Oyo State, Nigeria. This is with a view to enhancing maximum productivity which is germane to timely project delivery. The study identified various safety practices employed on site and factors influencing safety practices among contractors on Nigerian construction sites. The data for the study were obtained using multiple-choice questionnaire administered on 43 construction sites in Ibadan, Oyo State. A total of eighty-five (85) copies of questionnaire were distributed to respondents out of which sixty (60) were returned representing 70.5% response rate. Data received were analyzed using relative importance index (RII). The study revealed that identification of hazard ranked 1st position with RII of 0.90, medical provision ranked 2nd with RII of 0.87, risk control ranked 3rd with RII of 0.83, Occupational safety and health practices ranked 4th with RII of 0.80, safety review ranked 5th with RII of 0.75 and revealed that lack of safety management committee is the utmost factor affecting the adoption of safety practices in the Nigeria construction sites The study therefore concluded that hazard identification, instant medical provision, occupational safety and health programme are paramount towards achieving safe project delivery as revealed by the study and recommended that contracting firms should device a strategy that would identify hazards inherent in a particular project and set up safety management committees who would always be concerned with the safety of all and sundry on site.

Keywords: *Construction Sites, Hazards, Risks and Safety Management Procedures.*

1.0 INTRODUCTION

The construction industry world over, is however considered as one of the most hazardous industry. The International Training Centre of the International Labour Organization (2011) claims that one in six fatal accidents at work occur on a construction site. It further stated that no less than 60,000 fatal accidents occur on construction sites around the world every year. Similar conclusions were made by Keller and Keller (2009) and Injuries Board (2009). Considering the adverse impacts of accidents, construction safety management is of genuine concern to all stakeholders in the construction industry. Construction industry is also viewed as labour intensive because labour cost amounts to 40-65% of the overall cost of a project (Rao, Sreenivasan & Babu, 2015). Therefore, the labour intensive nature of the industry will demands more human involvement at the production stage.

Smallwood and Haupt (2002) viewed accidents as part of the building production process that is unavoidable because construction industry is inherently dangerous, therefore, compliance or not to safety practices will forfeit the impact of safety regulations. Factors adding to occurrence of construction fatalities were known as the uniqueness of the sector that differentiate it from other industries

Diugwu, Baba and Egila (2012); Okolie and Okoye (2012); Idubor and Oisamoje (2013) and Umeokafor, Umeadi and Jones (2014) contend that the number and magnitude of accidents occurring and recorded on construction sites in Nigeria underscored low level of safety practices. However, safety is implemented, in essence, by contractors on work sites indeed need to adopt adequate safety related systems for the provision and control of work environment system and human behaviour.

Government, unions and insurers have spent a great deal of time and effort attempting to evolve legislation, rules and regulations to help reduce the large loss of life and limbs, and the high number of "loss-work days"

The practice of safety in construction is regulated by governmental agencies such as the occupational safety and health administration (OSHA), which provides strict rules and regulation to enforce safety and health standards on jobsites. However, Legislation alone cannot reduce rates unless craftsmen and management takes positive actions to integrate these rules into their everyday activities by implementing a safety management program. Safety management is aimed at removing or minimizing the forces which cause losses through injured workers, or damaged equipment and facilities. (Mohamed, 2003).

Hence, presence of a safety culture in contracting organization is immensely needed which should be concerned with the determinants of ability to manage safety from top to bottom organization attitude approach. This safety culture is largely dependent on a total safety management philosophy which finds its root from total quality management principles.

Although, the concept of total safety management is relatively new in the construction industry; however, it is gaining popularity due to its ability to embrace all perceptions, psychological, behavioral and managerial factors. There is a gross increase in the occurrence of casualties and illnesses reported on project sites. This is unacceptably high considering the numerous regulatory standards and control systems for construction projects, thereby creating serious threat to construction workers' health at work. Thus, proactive step must be taken to identify these factors and be averted accordingly.

2.0 LITERATURE REVIEW

2.1 Occupational Safety Management Practices

Establishing a safety and health programme at job site is one of the most effective ways of protecting the most valuable asset: your workers. Losing workers to injury or illness, even for a short time, can cause significant disruption and cost—to you as well as the workers and their families. It can also damage workplace morale, productivity, turnover, and reputation **(**OSHA, 2016**).**
Bluff (2003); Needleman (2000); La Montagne *et al*. (2003); and Indian Council of Medical Research (2003) uniformly recommended that construction firms adopt safety system that seeks to prevent the occurrence of accidents rather than essentially managing accident cases and victims by paying medical bills and compensation. Similarly, OSHA (2016) stated that finding and fixing hazards before they cause injury or illness is a far more effective approach. Doing so avoids the direct and indirect costs of worker injuries and illnesses, and promotes a positive work environment. The "find and fix" approach to workplace hazards refers to the "Hazard Identification" and "Hazard Prevention and Control" core elements. Because of the wide variety of site conditions, these two core elements should be implemented on a site-specific basis in order to effectively detect and correct hazards.
The core of such safety management system as highlighted by Bluff (2003) includes "systematic identification of hazards, assessment and control of risks, evaluation and review of risk control measures" to ensure that they are effectively implemented and maintained. Needleman (2000) on the other hand recommended that an effective safety system management requires management commitment to Occupational Health and Safety administration (OSHA); assignment of responsibilities; OSHA procedures; OSHA communication mechanisms; hazard identification, prevention and control, accident investigation; OSHA training; documentation and evaluation of program effectiveness. Bluff (2003) further opined that if such safety management system would be effective then responsibility must be designated to competent safety personnel who will determine and implement the required preventive measures; that workers will actively be involved; and that procedure are documented and repeatable. This implies that an effective safety management system requires the implementation of core structures and processes and action by key players.

2.2 Level of Implementation of Safety Practices

Nigerian construction firms especially the multinationals which seem to have inherited safety policies and systems from their parent companies yet record of repeated cases of accidents and injuries some of which include falls from height, trapped by something collapsing or overturning, struck by a moving vehicle, contact with electricity or electrical discharge, struck by flying/falling object during machine lifting of materials, contact with operating machinery or material being machined, exposure to hot or harmful substance or fire outbreak that engulfed their entire office premises (Consultant Ltd. 2011 cited in Samuel, 2014). Most often, the problem is not the level of awareness of importance of safety neither is a safety policy absent but it is more related to poor or lack of implementation of safety programmes and systems, as it is with many other key players in the Nigerian construction industry (La Montagne *et al.*, 2003; Indian Council of Medical Research, 2003).

Abdelhamid (2000) and Shamsuddin, *et al*., (2015) added that worker omission is the cause of construction injuries and can be view under behavior and human factor approach. Behavior approach underscores that construction workers are the original reason for fatality due to their unlimited number of costly mistakes at different stages of building production process. However, human factors approach makes suggestion that workers are the original victim of construction fatality not because of individuals' unsafe behaviour rather, the emphases was on the working environment settings.
Procedures and programmes of safety management system of construction firms are naturally expected to lead to highly safe construction sites if they are well followed and implemented. Research studies however, claim that accident and injury rate in many developing countries such as Nigeria is considerably higher than in Europe, U.S. and Australia (Idoro, 2004 & 2007). Koehn, Ahmed and Jayanti (2000) in Bust, Gibb and Pasquire (2004) reported that statistics has shown that there are 8 or 9 times as many fatalities and accidents on construction sites in developing countries than in industrialized developed regions. This is

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similar to the claims of Awodele and Ayoola (2005), Smallwood and Haupt (2005) that not less than hundreds of construction workers are being killed each year and many more rendered permanently disabled on Nigerian construction sites. It is either the installed safety management system is poorly managed or the safety system is not adequately addressing all the relevant safety issues involved in each construction project and site thereby making workers on site highly prone to accident. Clark (2006) reported that failure to adhere with the required safety procedures and as well take precautions against hazards such as wearing safety wears are common on project sites. Awwad, Awwad, El Souki & Jabbour, (2016) added that safety practices lack necessary implementation due to absence of proper monitoring system, low level of safety awareness and inadequate support from safety managers. Che Hassan, Basha, Wan Hanafi (2007) and Shamsuddin, Ani, Ismail and Ibrahim (2015) argued that workers' knowledge and understanding of safety at work setting remained vital in promoting safety among themselves on construction site. Matthew (2013) noted that construction company should provide awareness particularly on each project, that covers an outline of the project, a top to bottom survey of the safety necessities and desires, clearing arrangements and systems, disciplinary activities, substance manhandle testing policy and proactive management methods needed for the project.

The study of Kolawole (2014) in Minna, north central Nigeria submitted that that site workers embraced "safety training" as this enhances their performances and reduced accidents on site and also government did not have well defined safety act for construction activities. Agwu (2012) conducted a study on total safety management (TSM) an approach for improving organisational performance in six selected construction firms in Nigeria. They include: (Julius Berger Nigeria Plc, Setraco Nigeria Ltd, Fourgerolle Nigeria Ltd, Arab-Contractors Nigeria Ltd, Dantata & Sawoe Nigeria Ltd and Costain Nigeria Ltd). The outcome of the research suggested that integration of total safety management as part of the organisational policy would lead to improving safety practices on construction projects. The essence of total safety management practices in Nigerian can be sustained if the operatives maintain good attitudinal behaviour and structural modifications in management of construction safety.

Okoye, Ezeokonkwo, and Ezeokoli (2016) study recommended that, knowledge and compliance with health and safety practices alone cannot achieve optimum project performance, it would require safety culture which encompassed other factors such as: management commitment, workers' involvement and strict enforcement of safety regulation should be adopted.

2.3 Factors Influencing Non-Compliance With Safety Practices On Construction Sites.

The significance of occupational safety regulations has been taken seriously due to individual acceptance that construction accidents is an unavoidable act due to the characteristic of activities involved on project sites, thus making non-compliance with operational health and safety a common believe (Smallwood, 2002). Although many authors have worked on health and safety management on construction site, yet adequate consideration have not been lent to compliance with safety procedures which is fundamental to workers output. Olutuase (2014) studied safety management in the context of Nigerian industry with an intention to compare level of compliance with the international standards. The study outcome established existence of safety regulations in the management of construction projects. However, the system seems to be poorly characterised by ineffectiveness and poor documentation. The study called for urgent attention on construction managers to strictly adhere with the provisions safety regulation requirements for site management.

Ismail, Doostdar and Harun (2011) appraised factors influencing the implementation of safety management system for construction sites with specific focus on skilled labours. It was suggested that personal awareness and communication were the most influential safety management factors. It became imperative for the site managers to conduct enlightenment programmes among their workers to build safety consciousness in them. The study recommended the use of personal protective gadgets, reduction of manual work without neglecting the appropriate use of equipment and tools.
Umeokafor *et al.,* (2014) unearthed reasons regarding non-compliance with health and safety requirement in Nigerian construction sites, as owner's impact and weak implementation. The study concluded that, safety personnel should consider importance of implementing safety provision to attract construction manager and contractors in building a robust safety management on construction site, while client should use health and safety records as a required document for prequalifying contractors.

Okoye, Okolie and Aderibigbe (2014) conducted exploratory study on the cost of health and safety performance of building contractors in south-east Nigeria and the correlation between the cost of performance and projects outcome. Similarly, it also supported opinion of the construction practitioners that, implementation of programmes and policies regarding safety management would resort in increasing the overall project cost.

Famakin and Fawehinmi (2012) opined that inclusion of health and safety policies and programmes at the design stage, up through the completion stage is critical to project delivery.

3.0 METHODOLOGY

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Data for the study were obtained through a questionnaire survey of construction sites in Ibadan, Oyo State. In order to achieve the set objectives, random sampling technique was employed on forty three (43) contracting firms out of 117 registered contracting firms in Ibadan, Oyo State representing 36.75% of the contracting firm (www.Vconnect list of contracting firms in Ibadan, Oyo State).

These percentage selections were considered adequate according to Trochim (2007), for a small population of interest, sample of about 10-30% of the population is adequate.

3.1 Data Presentation and Analysis of Results

A total of Eighty-Five (85) copies of questionnaire were distributed to respondents of which a total of Sixty (60) were retrieved representing 70.6% response rate. Relative importance index (RII) was utilized in analyzing all data retrieved from respondents so as to rate their responses in order of their importance.

The relative importance index is expressed by:

RII $=\frac{\sum Wn}{AN}$, ($0 \leq$ index x ≤ 1)

Where, W = Weight given to each factor by respondents,

A = Highest weight; N = Total Number of respondents.

4.0 RESULTS AND DISCUSSIONS

In presenting results of the questionnaire survey, the research examined, at first the safety procedures on construction sites. The result of the first part of the analysis is presented in Table 4.0. The results were obtained from analyzing the responses of 43 construction sites.

The second part examined and analyzed the factors influencing adoption of safety procedures as presented in Table 4.1.

Table 4.0 revealed that identification of hazard ranked 1st position with RII of 0.90, medical provision ranked 2nd with RII of 0.87, risk control with RII of 0.83 ranked 3rd, Occupational safety and health practices ranked 4th with RII of 0.80, safety review ranked 5th with RII of 0.75. It further showed other safety procedure with their corresponding ranking positions and RII values. However, the first five safety procedures were significant to achieving safe delivery of projects without ignoring other lesser procedures.

Table 4.1 indicated that establishing the total safety management committee has the highest RII 0.95, followed by giving the committee an awareness training 0.88, handling of materials 0.80, communication and information 0.75 work tools or equipment 0.68, developing the organization mission and objectives 0.65, gaining executive level committee 0.64, planning of construction 0.63, molding the committee into a team 0.61, while the least is staff training 0.52. The research had established that important factors influencing the adoption of safety practices should be ultimately considered by contracting firms prior site work.

Table 1: Safety Procedures Employed on Construction Sites

	Frequency							
Safety Procedures	**5**	**4**	**3**	**2**	**1**	**Total**	**RII**	**Ranking**
Identification of hazard	41	9	10	0	0	60	0.90	1
Medical provision	41	0	19	0	0	60	0.87	2
Risk Control measures	9	51	0	0	0	60	0.83	3
Occupational Safety and Health practice	35	0	16	9	0	60	0.80	4
Safety review	0	44	16	0	0	60	0.75	5
OSH training	0	50	0	10	0	60	0.73	6
Assignment of responsibility	0	0	60	0	0	60	0.60	7
Communication Mechanism	0	9	35	16	0	60	0.58	8
Accident Investigation	0	18	16	26	0	60	0.57	9
Emergency preparation	0	9	0	51	0	60	0.46	10

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Source: Authors

Table 2: Factors Influencing the Adoption of Safety Practices

Factors	Frequency 5	4	3	2	1	Total	RII	Ranking
Establishing the total safety								
management committee	50	5	5	0	0	60	0.95	1
awareness training	35	15	10	0	0	60	0.88	2
Handing of materials	26	18	10	3	3	60	0.8	3
Communication and information	9	26	25	0	0	60	0.75	4
Developing the organization								
mission and objectives	20	10	15	5	10	60	0.68	5
Work tools or equipment	15	15	10	10	10	60	0.65	6
Gaining executive level committee	26	9	0	0	25	60	0.64	7
Planning of construction	0	35	9	6	10	60	0.63	8
Molding the committee into a team	6	20	9	20	5	60	0.61	9
Giving the committee an								
Staff training	4	2	30	14	10	60	0.52	10

Source: Authors

5.0 CONCLUSION AND RECOMMENDATIONS

There are have been many studies aimed at the assessment of safety practices on construction sites in Nigeria but there is still need to access the study vividly in order to ascertain the precise safety practices among contractors especially in the construction industry in Nigeria. in line with the findings of the study, it is hereby concluded that hazard identification, instant medical provision, occupational safety and health programme are paramount towards achieving safe project delivery as revealed by the study.

However, the following recommendations should be adequately considered:

1. Proactive approach to managing occupational safety and health. Contracting firms should device a strategy to identify hazard inherent in a particular project before it commences. When hazards are identified, measures to prevent their occurrence would be put in place and also measure to suppress their effects perhaps they occur by chance. It takes minimal cost to prevent hazard than correcting it when it has happened.

2. Also, every contracting firm should establish the total safety management committee who will see to the welfare of craftsmen, supervisors and who can as well sanction erring site workers who decline from using safety measures put in place.

3. Employers in construction work must have a programme that includes measures to detect and correct workplace hazards. It should be the mandate of contracting firm to design a road map towards addressing accidents on site. This can be in form of insurance, safety gadgets, compensation.

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