ASSESSMENT OF THE IMPLIMENTATION OF ACCIDENT PREVENTIVE MEASURES ON CONSTRUCTION SITES IN ABUJA

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Abstract *- Generally, construction activity is a complex and lengthy process. Safety on construction sites is important this is because lack of adherence to safety requirements has led to increased exposure of workmen and the general public to risky situation at construction sites resulting in a high chance of occurrence of accidents. The study aimed at assessing the level of implementation of accident preventive measures on construction sites. The study adopted quantitative approach. The research population constituted construction companies in Abuja. A total of 71 questionnaires were administered, from which a total of 64 was retrieved representing 90% response rate. The data collected was analyzed using descriptive methods (descriptive percentages and mean item score). It was discovered that accident preventive measures are not always implemented by construction companies and there is a frequent trend of accident occurrence on construction sites. The research also found out that the most common category of*

accident on construction sites is slip and trip accident. Based on these findings, it can be concluded that the level of implementation of accident preventive measures on construction site in Abuja is not as effective as expected. Base on the conclusion reached, the research recommends that they should be a steady implementation of accident preventive measures on construction sites and that the clients, contractor and all professionals involved should be aware of the possible hazards on site and the preventive measures.

***Keywords**: Accident, Activity, Construction, Implementation, Prevention,*

1. Introduction

The construction industry has been identified with very high rate of accidents occurrences compared to any other industry. In recent times, they have been an increasing rate of operational accident resulting to death tolls, permanent disability, partial disability and some other severe environmental threats (Olatunji *et al.*, 2007; Orji 2014). The International Training Centre of the International Labour Organisation (2011) claims that one in six fatal accidents at work occur on a construction site. The rate of accidents and injuries in developing countries like Nigeria are generally considered to be higher than in the developed countries (Hämäläinen *et al.*, 2009). According to Consult Net Ltd (2011), Nigerian construction firms especially the multinationals which seem to have inherited safety policies and systems from their parent companies still record repeated cases of accidents and injuries. Most often, the problem is not

the level of awareness of importance of safety neither is a safety policy been absent in construction firms but it boils down to poor or lack of implementation of safety programmes and systems, as it is with many other key causes in the Nigerian construction industry (LaMontagne *et al.*, 2003). Despite being a party to the Geneva Occupational Safety and Health Convention 1981, Nigeria continues to default in implementing Occupational Health and Safety practices (Adeogun and Okafor, 2013). According to Idoro, (2011), high numbers of injuries still recorded on sites by contractors with the best safety records in Nigeria. Kolo, (2015) stated that accidents occur frequently on building construction sites in Nigeria with little or no documentation. While workers themselves are the cause of some of these accidents (due to illiteracy, lack of commitment to work etc.) some are caused as a result of poor or no safety measures employed by the construction companies/site staff on site. Belel and Mahmud (2012) attributed accidents on construction sites to a lack of appropriate consideration of implementations of preventive measures or practices in construction project delivery process. Nigeria continues to default in the implementation of occupational health and safety practices (Adeogun and Okafor, 2013). Molenaar *et al* (2002) advocated that safety plans should go beyond the levels of just drafting them, to ensure the creation of adequate safety culture on site. Despite the improvements realized through the adoption of preventive measures on construction sites to reduce the rate at which accidents occur on construction sites, it remains unclear the extent to which such practices are implemented by Nigerian construction firms as accidents still occur at high rates on

construction sites. This research was conducted to assess the level of implementation of accident preventive measures on construction sites. The specific objectives include: to examine the frequency of accident on construction site; to identify the types of accidents on construction site from the frequency examined; and, to determine the level of implementation of accident preventive measures on construction sites.

2. Literature Review

Frequency of Construction Site Accidents

Accidents frequently occur on building construction sites. These accidents could be in the form of Workers falling from heights, exaction accidents, the risk of falling debris or equipment etc. Researchers have shown that accidents and injuries in developing countries are generally high when compared to other European countries (Idoro, 2007). Hunter (2011) emphasized that construction sites are the most potentially hazardous and accident prone parts of any working environment. This implies that construction workers are constantly exposed to excessive site hazards which expose them to injuries and possibly death. Occupational Safety and Health Administration (2005) cited in Kadiri *et al* (2014) has fixed the number of fatal accidents on constructions sites around the world annually at 60,000. The construction industry has been identified with very high rate of accidents occurrences compared to any other industry. Risk of a fatality in the construction industry is five times more likely than in a manufacturing based industry, while it is two and a half times higher in cases of major injury (Maraqa and Mohamed, 2013;

CIDC, 2006; Davis and Tomasin, 1990). International Labour Organization, as cited by Aneziris *et al.* (2012), stated that construction sector contributes about 17% to total world workplace fatalities. In recent times, death tolls, permanent disability, partial disability and some other severe environmental threat with an increasing rate has been on the rise through collapse of buildings and other major operational accidents (Olatunji *et al.*, 2007). Mostly in all countries, United Kingdom (UK) and United States (US) inclusive, the occurrence of construction site accidents as well as injuries is at a very high magnitude (Idoro, 2011), as compared with other industries. Nigeria, like other developing countries (Idoro, 2008), is not left out of this scenario, though the lack of reliable data makes it impossible to know the actual rate of occurrence of accidents in Nigeria (Agwu, 2014; Udo, Usip, and Asuquo,2016).

Types of Construction Site Accident

Accidents on construction sites are of different types and have been identified by many researchers. Accidents that mostly occur on site, range from falls from heights/falling hazards Orji *et al.*, (2016), explosion Hovden *et al*, (2008), Vehicle accidents Edwards and Nicholas, (2002), fire outbreak HSE, (2006), electrocution/electrical incidents Nkem *et al.*, (2015), contact with electric current Umeokafor *et al.*, (2014). However, the most frequent accidents identified by HSE (2006) are falls, mobile plant, falling material and collapses, electrical accidents as well as trips. Apart from the occurrence of an accident, there is also exposure of workers to ill-health

condition as identified by HSE, which include asbestos, manual handling, noise and vibration, and finally chemical exposures. Furthermore, with the study carried out by Williams *et al.* (2017) on the types and frequency of accident in the South-western states of Nigeria, four categories of accident were most prominent which were contact with working tools, vehicle-related accidents, slip and trip, and fall-related accident and also Oladarin and Sotunbo (2012) identified that slip and trip accidents are the most common types of accident on construction sites. Furthermore different types of accidents with varying rates of occurrence and fatalities from previous works are scaffold accidents (OSHA (2005; HSE, (2006); Mccann and Paine; (2002, U.S Department of labour (2005); accidents due to slip, trips and falls Tappin *et al* (2004); crane accidents (Neitzel 2001; Skinner *et al*, 2006); ladder accidents, OSHA (2005); Mitra *et al*, (2007); and, electrocution and electrical accidents (Taylor *et al* 2002; Crowley and Homce, 2001). Also thirteen types (categories) of accident were differently identified from literature. These are: Fall-related accident; Contact with objects; Vehicle/ Machine-related accident; Lifting and handling objects accident; Explosions; Collapse accident; Welding accident; Drown/Asphyxiation accident; Animal behaviour accident; Slip and Trip accident; Victim of human aggression; Equipment/tools related accident; and Electrocution accident.

Level of Implementation of Accident Preventive Measures

Koehn, Ahmed, and Jayanti (2000), Idoro (2008) and Enhassi, Choudhry, Mayer amd Shoman (2008) all express similar

worry as to why worse safety conditions persist on construction work sites in most developing countries like Nigeria. The irony of the situation is that the causes of accidents are well known and can be managed in the enterprise, (International Training Centre of the ILO, 2011; Indian Council of Medical Research, 2003). However in recent times, the construction industry in Nigeria has increased efforts to enhance the performance of health and safety but these efforts have been transferred from performance of safety to preventive measures so as to improve the performance (Okoye and Okolie, 2014). But according to Ikechukwu and Dorothy (2013), Nigeria is one of the countries without adaptive regulatory laws on health and safety to help check the implementation of preventive measures on construction sites and ensuring that they are adequate. Samuel *et al* (2010) revealed that there was a serious lack of structures and procedures regarding worker safety at all levels of construction chain. Bruno *et al* (2012) also suggested that about 81.1% of Nigerian construction Site workers do not wear personal protective equipment (PPE) provided by the contractors, there reasons for these being that the protective equipment are either oversized/undersized or heavy.

3. Methodology

The quantitative method is employed in this research. The research population constituted the construction companies operating in Abuja, Nigeria. Random sampling technique was adopted to select the sample from the entire population. It is a type of probability sampling to ensure that among the

identified target groups equal and independent chance is given. A population size of 244 construction companies in Abuja was used. This value was subjected to the Yamane formula for determining the minimum sample size value in the population. The value was reduced to a minimum of 71 at 10% limit of error; implying that 71 is the minimum number of questionnaires that can be administered within the population. The response rate of 90% was achieved as 71 questionnaires were administered and 64 were retrieved with all fully answered. The questionnaire for this study comprised close ended questions with answers provided for respondents to choose from. and archival data on frequency of accident and the types for a period of ten years was collected and was presented using graphs .The data collected from archives was used to determine the frequency of accident on construction site and also to determine the most common category of accident that occur on construction site .the data was analyzed using the descriptive percentile method. The data collected through structured questionnaire were analyzed using descriptive statistical method (mean item score and ranking) which were found in the statistical package for social science (SPSS) version 22. The analyzed data was presented in form of table. Mean item score was used in the study to determine the level of implementation of accident preventive measures on construction sites. The mean score is given by the formula:

$$\text{Mean score} = \frac{Ranking\ X\ frequency\ of\ ranking}{Total\ Number\ of\ Respondents}$$

It is meaningful to know that the item with the highest mean is usually assigned with rank 1; the second is assigned with rank 2 till the least item.

4. Results and Discussion

Frequency of Accident on Construction Site

Figure 4.1 shows the frequency of accident on construction sites over a span of ten years with year 2011 and 2012 having the highest number of accident which amounted to 14% of the total number of accident recorded. The results shows a frequent trend of accidents on construction sites which is in tandem with, Idoro (2011) who stated that the occurrence of construction site accidents as well as injuries is at a very high magnitude, but does not agree with the study on the rate of accident occurrence in Lagos by Oladarin and Sotunbo (2012) who concluded that the rate of accident occurrence is low.

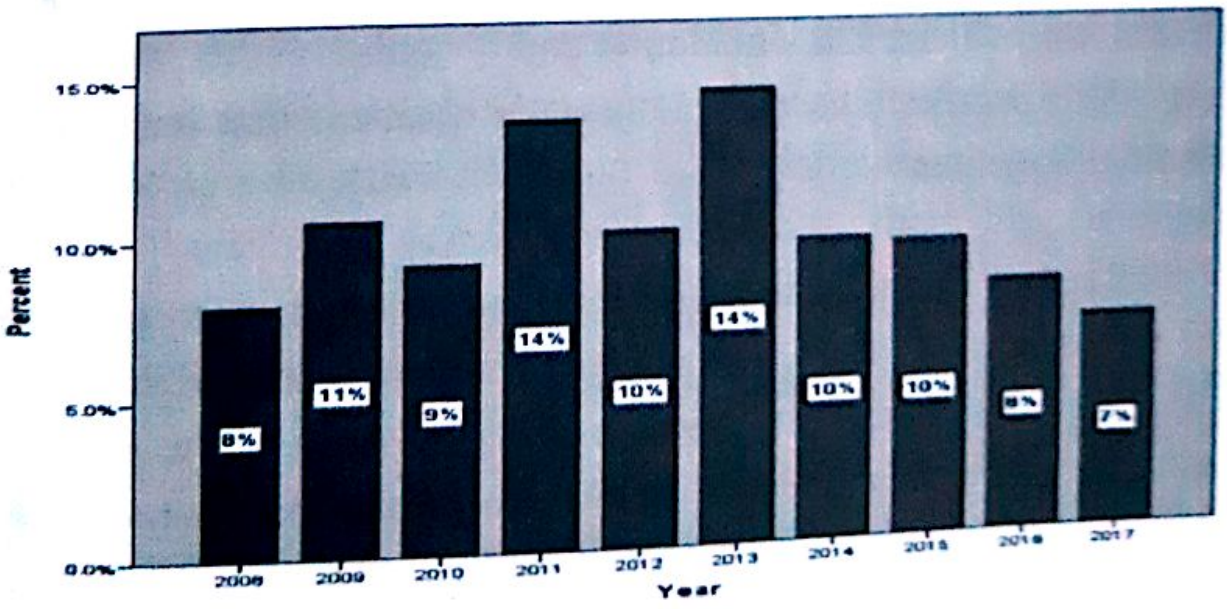

Figure 4.1: frequency of Accident on construction site

Types of Accident on Construction Site

The results of the type of accident on construction sites were presented in figure 4.2.The result shows that slip and trip related accidents were the most common accident occurring in construction firms followed by fall accidents recorded by construction firms in 10 years .The result is in tandem with findings from study by Oladarin and Sotunbo (2012) who concluded that slip and trip accidents are the most common types of accident on construction sites. It also goes in line with the study carried out by Williams *et al.* (2017) on the types and frequency of accident in the South-western states of Nigeria, concluding that four categories of accident were most prominent which were contact with working tools, vehicle-related accidents, slip and trip, and fall-related accident in contrast with findings from Orji *et al.*(2016), Hovden *et al.*(2008), Edwards and Nicholas,(2002), HSE (2006), Nkem *et al.*(2015) and Umeokafor *et al.*(2014) who identified fall from height, Vehicle accidents ,explosion, fire outbreak, electrocution/electrical incidents and contact with electric current respectively as the category of accident that occur on construction sites.

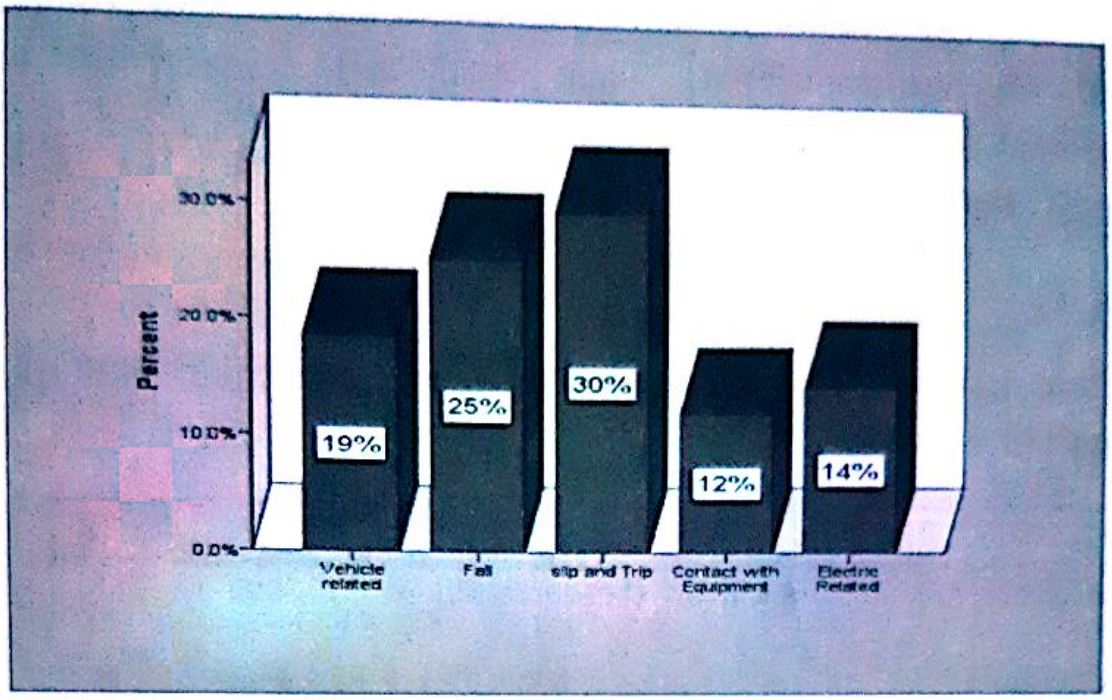

Figure 4.2: types of accidents on construction sites

Level of Implementation of Accident Preventive Measures on Construction Sites.

From responses gotten from respondents as presented in table 4.1, sanitation, Co-operating with all parties involved in construction, Keeping tools and personal protective equipment in good condition, Providing first aid and medical attention, Appointing competent staff and Site illumination were ranked as the accident preventive measures that are always implemented by construction firms. Olatunji and Ade (2005) stated that Safety factors are not given high priority which is true as most of the accident preventive measures ranking showed that they are often implemented by construction firms while others sometimes implement and some falls within the seldom region. From result gotten from the study safety measures are not always implemented which agrees with Mba, *et al* (2004) who stated that there is a poor safety culture in

Nigerian construction industry and also in tandem with Abdul and Muhammed (2008) who stated that comprehensive accident prevention policies have not been established by many employers.

Table 4.1: Accident preventive measures and their level of implementation

ACCIDENT PREVENTIVE MEASURES	MEAN	RANK
Co-operate with all parties involved in construction	4.92	1
Sanitation	4.75	2
Keep tools and equipment in good condition	4.75	2
Provide first aid and medical attention	4.69	4
Appoint competent staff	4.61	5
Site illumination	4.61	5
Communication between the employer and workers	4.47	7
Fire protection and prevention	4.17	8
Housekeeping	4.14	9
Provide personal protective equipment and clothing for workers	4.05	10
Allocate health and safety coordinator/supervisor	3.94	11
Provide health and safety training for workers and	3.69	12

supervisors	3.61	13
Explosives used or to be used on the sites are stored, transported, used and disposed	3.48	14
Safety awareness and consciousness	3.42	15
Emergency routes and exits remain clear of obstruction	3.27	16
Investigate all accidents that occur in your firm	3.14	17
Provide welfare facilities from the start of the construction phase	3.00	18
Provide pregnant women and nursing mothers at work on the site with appropriate facilities	2.98	19
Accident prevention by signs and tag		

Source: research analysis

Table 4.1:contd.

ACCIDENT PREVENTIVE MEASURES	MEAN	RANK

Provide and maintain equipment, materials or things that are properly equipped with safety devices	2.61	20
Notify health and safety agency if construction phase is likely to involve more than 500 person for more than 30 days of construction work	2.25	21
deliver safety file to the client on the completion of the project	1.77	22
Use of technology to improve conditions	1.73	23
Use health and safety file	1.72	24

Source: research analysis

5. Conclusion and Recommendation

Generally, construction activity is a complex and lengthy process. The total development of a construction project normally consists of several phases requiring a diverse range of specialized services. Greater emphasis has been given to Cost, time, quality at the expense of safety. Safety on construction sites is important this is because Lack of adherence to safety requirements has led to increased exposure of workmen and the general public to risky situation at construction sites resulting in a high chance of occurrence of accidents. The study aimed at assessing the level of implementation of accident preventive measures on construction sites and it was discovered that accident preventive measures are not always implemented by

construction companies and there a frequent trend of accident occurrence on construction sites. The research also found that the most common category of accident is slip and trip accident. Based on these findings, it can be concluded that the level of implementation of accident preventive measures on construction site in Abuja is not as effective as expected.

Based on this conclusion, the research recommends that they should be a steady implementation of accident preventive measures on construction sites and that the clients, contractor and all professionals involved should be aware of the possible hazards on site and the preventive measures, contractors should not only be profit driven but safety conscious and they should be periodic check on site by safety experts to know the working condition of workers and to evaluate the possible risks that they are subjected to.

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