

SAFETY PRACTICES ON BUILDING CONSTRUCTION SITES FOR SUSTAINABLE DEVELOPMENT IN NIGERIA

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ABSTRACT

The safety of construction workers on site is paramount to the overall success of the project, it's only when workers are in a sound state of mind and are physically healthy that work can go on efficiently. Therefore, the aim of this paper is to examine strategies for improving safety practices on building construction sites in North Central, Nigeria. Questionnaire were administered to respondents on building construction sites and the data obtained were analysed and ranked using Mean Scores. The findings of the study established that lack of workers' adaptability to safety practices is the reason for accidents on sites, training of workers is key to effective safety practices. The study recommends minimum of one safety managers on every construction sites. The paper ultimately adds to the existing body of knowledge, and provides an insight to the practices of health and safety training in construction firms in North Central, Nigeria.

Keywords: Construction sites, accidents, occupational health, safety practices, sustainable development

INTRODUCTION

The labour intensive nature of construction industry will demands more human involvement at the production stage. However, the magnitude of casualty suffered in execution of building projects across the globe, has made the construction industry the most dangerous or highly hazardous industry. Construction industry is viewed as labour intensive because labour cost amounts to 40-65% of the overall cost of a project (Rao, Sreenivasan and Babu, 2015). Therefore, the labour intensive nature of the industry will demands more human involvement at the production stage. However, the industry compared with other sectors of the economy, due to the magnitude of casualty suffered in execution of building projects across the globe, has made the construction industry the most dangerous or highly hazardous industry in view of (International Labour Organisation, 2009).

All over the world, construction is regarded as one of the most hazardous industries, due to its unique nature (Olutuase, 2014). Construction safety is always a grave concern for both practitioners and researchers. Construction workers face different kinds of safety and health hazards while working every day. Over 60,000 fatal injuries are reported every year from construction projects around the world (Lingard, 2013). The occupational Safety and Health Administration (OSHA), an agency under the United State Department of Labour reports that 1 in 10 construction site workers are injured every year. The American Bureau of Labor Statistics figured that roughly 150,000 injuries occur each year in the construction site. Such figures argument the construction industry as one of the most hazardous and accident-prone working environments. The safety of construction workers on sites is important towards the success of any project. Only when workers are in a sound state of mind and are healthy that work can go on efficiently (Okoye, Ezeokonkwo, & Ezeokoli, 2016).

Occurrence of accidents or injury to workers tends to demoralise the workers in some cases and leads to suspension of construction activities. Persistent health and safety challenges in Nigerian construction industry which ultimately results in different types of loss and magnitude is on the increase (Akinwale & Olusanya, 2016). A number of factors influencing safety performance in the construction industry were identified which include worker's attitudes, construction company size, safety policy and training, project coordination, and economic pressure. Thus, occupational Safety and Health Administration (OSHA), proposes the need for consistent training of artisans and managers about workplace hazards and control in order to ensure safety and productivity (Neale, 2013). Training, in this context, is to provide workers and managers with a greater understanding of health and safety policies and practices for them to work safely and ensure that their actions and inactions do not harm any other person.

LITERATURE REVIEW

Sustainable Development and Safety of Workers

Sustainable development is the optimum use of resources in all respects. Construction activities should incorporate structures for human health and environmental protection as a base line for sustainable development (Isa, Jimoh & Achuen, 2013). Workplace safety and health brings sustainable development. Controlled environment, safer workplace, heathy workforce, improved occupational work place safety knowledge and reduction of cost as a result of accident bring sustainable development (Surbeck & Hilger 2014; Hinze, et al, 2012). For any system to be sustainable it should be characterized by seven elements; vision, strategy, effective goal. Training, communication, risk management, active workers and leadership engagement. The

interface between OSH and sustainable development are (People, Planet and Profit) which are strongly infused entities for the improvement of OSH and sustainable development of the citizen. Construction Firms cannot be considered as sustainable, without significant consideration for occupational health and safety of workers (Wojick, 2015; Cary, 2013).

Globally, costs of occupational health and safety diseases have been on the increase. Global financial losses due to workplace injuries and ill health exceed \$1250 billion International Labour Organisation (ILO, 2009). By conservative estimates workers suffers 270 million occupational accidents and 160 million occupational diseases each year. Occupational injuries alone account for more than 10 million Disability- Adjusted Life Years lost, or healthy years of life lost whether to disability or premature death, and 8% of unintentional injuries worldwide. Poor occupational health and reduced working capacity of workers may cause economic loss up to 10-20% of the Gross National Product of a country (ILO,2009).

In the past occupational health and safety was not the focus but nowadays health and safety has become a global issue. The prevalent of occupational health and safety problems is increasing the level of poverty in the society. Health and safety of construction workers is a socio – economic factor under sustainable development which has not been given adequate consideration. Most construction companies focus their attention on productivity improvement, technological advancement and profit maximisation with less concern for workers' safety (Kassu, Daniel & Beshah 2016). This approach results in indifference to social aspect of sustainable development.

Construction Industry and Safety Practices

Safety can be viewed as a point at which all associated risks with a particular job are well managed in a reasonable manner. Safety has been defined as unique event that is paramount to continuous attainment of productivity. In the same vein, safety should focus on curbing accidents at work setting and its negative effect on the workers in all manner. (Ahmad, Iqbal, Rashid & Roomi 2016). Management of safety in construction project reveals that adoption and compliance with health and safety provision served as catalyst in optimizing construction production process. Without compliance to health and safety practices, more accident will result in pains, accidents and legal actions thereby escalating production cost (Idubor & Oisamoje 2013; Dodo, 2014; & Umeokafor *et al.*, 2014). Safety practices are parameter to measure successful project delivery which is most paramount to the client because they greatly influenced in achieving efficiency and effectiveness amongst professionals and even workers in the construction industry. (Famakin & Fawehinmi 2012)

The anomalies as seen in the construction firm's failure to comply with minimum requirement of health and safety practices might cause the victim waste of time and loss of money to the firms. Although construction firms may be covered with life assurance for their staffers from certain direct costs resulting from injury suffered, however some cost may be involved which cannot be insured against, such as loss of trained personnel, loss of production hours due to other operatives stopping the progress of the work out of concern or assisting the injured persons (Dodo, 2014). Thus, the lack of adherence to safety practices will delay the production process and invariably affect sustainable development.

Several attempts have been considered by the construction industry towards improving its safety performance. However, the paradigm shifts from monitoring safety performance to preventive measures of improving safety performance is necessary. Some developing nations like Nigeria are among the nations that lack adaptive laws and regulations on health and safety

practices. Management of safety practices can only be effective when it is approached from socio-humanitarian perspective, and economic perspective. (Muhammad, Abdulateef & Ladi 2015).

Accident on Nigerian Construction Sites

Accidents are events which are unplanned and unexpected caused by someone's mistakes which could have been prevented. Accidents on construction sites can be attributed to two (2) main components of human failures; errors and violations (Idoro, 2011). A cross section of occupational fatalities in the construction sector showed that for developed countries, such as United State had over 22%, across the European Union had 30%, United Kingdom had 32%. The accident rate situation highlighted in developing countries is worse. Several factors have been attributed to this phenomenon (Muhammad, Abdulateef & Ladi, 2015). It had been observed that priorities are not given to safety consideration on construction projects in developing countries (Akinwale & Olusanya, 2016). Stakeholders in Nigeria do not attach much seriousness to the issue of safety, most accidents and injuries are not often reported, and on many site, no training programmes on safety for the staff and workers exist (Idoro, 2011 & Dodo, 2014). Report from Nigeria revealed that there are 2 accidents and 5 injuries per 100 workers. Most fatalities in construction related accidents that become known are those aired via media on collapse of ongoing building construction works and this is on the increase. It has also been estimated that around 5,500 workers die daily from work related accidents or diseases (Agwu & Olele 2014; Mohammad, et al. 2015). Perceived increment in the number of casualties and illnesses reported on construction project sites are unacceptably high, considering the numerous regulatory standards and control systems for construction projects. Thus, proactive step must be taken to identify this factors and be averted accordingly.

METHODOLOGY

Research methods are the different processes, systems and algorithms used in study, while research methodology is a science of how to conduct studies, research design involves scientific research methods and processes. (Bishop & Herron, 2015). The study is a research survey involving the use of cross-sectional survey design. The data used in the study was made up of variables of the same sample observed at one point in time in Jos, North Central, Nigeria. The population of this study includes in particular, the Architects, Quantity Surveyors, Contractors, Safety Managers, Estate Surveyors, Civil Engineers and Builders. The sampling techniques used in this research is purposive methods of sampling. This technique was used as participants were chosen among professionals with expertise in building projects. Such technique is recommended when a researcher wishes to select respondents that have particular information in fulfilling the research objective (Saunders, Lewis, & Thornhill 2009). A total of 120 questionnaire were distributed and 88 questionnaire were returned. This reflects a 73 percent response rate. With the help of Statistical Packages for Social Science (SPSS), data collected were analysed using descriptive statistics where the mean was used as a basis to rank the factors studied. This data analysis technique is informed by the works of (Bryman,2012).

RESULTS AND DISCUSSION OF FINDINGS

Results arising from the analysis of data collected for the study are presented in this section. This includes the evaluation of causes of accident on building construction sites, strategies for improving safety practices on building construction sites, and effects of safety practices on construction sites.

Table 1: Causes of Accident on Building Construction Sites

Variables	Professional	Scores
Lack of adaptability of workers to safety practices as against the traditional practices.	3.84	1 st
Unethical practices of worker due to human attitudinal peculiarities and traditional practices.	3.06	13 th
Insufficient instructions about the working condition and environment.	3.77	4 th
Inadequate engagement of safety managers and ineffective supervision on site.	3.61	10 th
Unsafe practices of worker due to religious assertions.	3.64	7 th
Workers inadequate or lack of understanding about the workplace safety rules	3.73	5 th
Lack of proper knowledge on hazards management.	3.62	9 th
Lack of proper training on the use of safety wears provided for use at work.	3.59	11 th
Perception that safety wears is not comfortable to work with.	3.53	12 th
Operatives engagement in improper conduct that could affect others workers.	3.70	6 th
Ineffective communication between safety personnel and workers	3.81	2 nd
Lack of training on key issues pertaining health and safety consciousness	3.78	3 rd
Willingness of the workers to meet their daily output.	3.63	8 th

Critical observations on the Table 3 revealed five top causes of accident as a result of workers declining to embrace safety practices as follows: lack of adaptability of workers to safety practices as against traditional practices 3.84, ineffective communication between safety personnel and workers 3.81, lack of training on key issues pertaining health and safety consciousness 3.78, workers inadequate or lack of understanding about the workplace safety rules 3.73, operatives engagement in improper conduct that could affect others workers 3.70. Safety managers must look into the best strategy to implement effective safety practices on site.

Table 2: Strategies for improving safety practices on building construction sites

Safety Practice Parameter	Professional	Scores
	Mean	Rank
Training of new staff on safety practices	4.35	1 st
Safety consciousness on site by workers	4.31	2 nd
Training on proper use of scaffoldings	4.23	3 rd
Daily safety briefing by safety manager	4.16	4 th
Availability of safety communication gadgets on site.	4.13	8 th
Involving safety managers on causes of accidents	4.10	10 th
Inspection of scaffold, equipment and tools before the start of work	4.15	5 th
Making the use of personal protective equipment/ safety wears mandatory	4.11	9 th
Provision of First aid and welfare facilities	4.15	5 th
Positive safety attitude and behaviour	4.09	11 th
Planning on issues relating to health and safety	4.05	13 th
Setting safety guidelines into the body of conditions of contract.	4.14	7 th
Employment of safety managers on construction sites.	4.08	12 th
Establishment of health and safety department	3.84	14 th
Proper waste management on site.	3.81	15 th
Use of safety net where the height of building exceeds two storey	3.78	16 th
Construction risk insurance for the project' staff and site operatives	3.77	17 th
Making health and safety clearance/ certificate a requirement.	3.68	18 th

Five top ranked strategies for effective safety practices on sites by respondents among the factors are: training of new staff on safety practices against the traditional practices of workers (4.35), closely followed by safety consciousness by workers on sites (4.31), training on proper use of scaffoldings (4.23), daily safety briefing by safety manager (4.16), inspection of scaffolds, equipment and tools before the start of work (4.15).

Table 3: Effects of safety practices on workers' operations

Variables	Professional	Scores
	Mean	Rank
Safety practices will improve safety among workers	3.70	5 th
Safety practices will reduce accident impact on operatives	3.84	1 st
Safety of workers will enhance project performance	3.63	8 th
Workers productivity will be better if trained on the use of safety wears.	3.78	3 rd
Safety wears will provide necessary safety at work	3.68	6 th
Workers will get more income if there is absent of injury by safety practices.	3.81	2 nd
The benefits are more than the cost of training safety officer.	3.06	10 th
Workers output are enhanced through the use of safety wears	3.61	8 th
Reduce construction delay	3.77	4 th
Improve environmental quality	3.64	7 th
Reduce litigation and claims due to damages	3.63	8 th

Table 2 depicts that workers' knowledge on the benefits of safety practices as follows: safety practices will reduce accident impact on operatives (3.84), workers will get more income if there is absent of injury by safety practices (3.81), Workers productivity will be better if trained on the use of safety wears (3.78), safety practice will reduce construction delay (3.77), safety practices will improve environmental quality (3.64).

DISCUSSION

Causes of Accident on Building Construction Sites

The result presented on Table 1 depict the mean scores of the professionals' perception on causes of accidents on construction site. Out of the thirteen listed parameters, five most causes of accident among the parameters listed are: lack of adaptability of workers to safety practices as against traditional practices, ineffective communication between safety personnel and workers, lack of training on key issues pertaining health and safety consciousness, workers inadequate or lack of understanding about the workplace safety rules, operatives engagement in improper conduct that affect others workers' safety. Safety managers must look into the best strategy to implement effective safety practices on site. All of these are within the capacity of the construction company, any attempt to improve and subscribe to this practices will go a long way to solve the challenges confronted by the industry. This is consistence with Idoro, (2011) findings that stressed the need for construction company to provide adequate safety training on each project, this will reduce accidents amongst workers and promote sustainable development.

Strategies for Improving Safety Practices on Sites

Result presented in Table 2 on measure for improving safety practices on sites revealed five top ranked factors using mean score from eighteen listed variables as: adaptability of workers to safety practices as: training of new staff on safety practices against the traditional practices of workers, closely followed by safety consciousness by workers on sites, training on proper use of scaffoldings, daily safety briefing by safety manager, inspection of scaffolds, equipment and tools before the start of work. All of these factors are within the control of the safety or site manager and if implemented it will go a long way in addressing the issues of workers' safety. This finding is consistent with Dodo, (2014) who noted that training of workers will improve safety practices on sites.

Effects of safety practices on workers' operations on sites.

Respondents agreed that the effects of safety practices on workers' operation on construction sites, includes: safety practices will improve safety among workers, this is consistency with the outcome of Shamsuddin *et al.*, (2015) that established that safety practices play vital roles in protecting workers on construction sites, thus necessary tools and safety wears should be made available. It would reduce accidents impact on the victims, enhances safety participation of site operatives. This is also in agreement with Muhammad, Abdulateef and Ladi (2015) findings that workers' compliance with health and safety regulations have great impact in determining workers' quality and productivity on construction projects.

CONCLUSION

This study investigated safety practices on building construction sites for sustainable development. Based on the findings of this study, it was concluded that the causes of accident are lack of adaptability of workers to safety practices as against traditional practices, ineffective communication between safety personnel and workers, lack of training on key issues pertaining health and safety consciousness, workers' lack of understanding about the workplace safety rules, operatives' engagement in improper conduct that affect others workers and failure of construction managers from engaging the best strategy to implement effective safety practices on site. Further conclusion is that strategies to improve safety practices on sites should include: training of new staff on safety practices against the traditional practices of workers, strictly enforcing safety consciousness by workers on sites, training on proper use of scaffoldings, daily safety briefing by safety manager, inspection of scaffolds, equipment and tools before the start of work. The study further concluded that effects of safety practices may include; reduction of accident impact on operatives, cost savings as a result of absent of injury, improved workers productivity, reduction in project delay and improvement in work place environment. The study recommends that safety managers should be engaged to achieve effective safety practices on construction sites. In addition, training of workers on safety practices should be given adequate priority. This would ensure optimum utilisation of human resources on construction sites and promote sustainable development.

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