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# **SAFETY IN CONSTRUCTION: REDUCING THE PHYSICAL DEMANDS ON WORKERS IN NIGERIA**

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## **ABSTRACT**

*A proactive safety culture helps to save lives, retain workers, reduce claims and enhance productivity on construction sites. Previous studies show that health and safety has not been given enough attention in the construction industry in Nigeria. This paper investigated the physical demands on construction workers in different project site. This study was carried out on the construction of 10 number senior staff bungalow at Asaba campus of Delta State University, belonging to the same client and ten different building contractors. Data for the study were generated from two methods, using questionnaire and interview guide. To achieve this, one hundred (100) questionnaires were developed and distributed randomly to ten workers on each site and a response rate of 100% was achieved because the research assistants administered and collected immediately, while the interview source is the site head on each site. Data was analysed using frequency tables, percentages and ranking. The result of the analysis reveals that site works are exposed to high risks in construction, low safety policies are in place and most of the workers do not know how to use some of the existing safety tools. Implications of these finding and future research directions are discussed. The study concludes that improved safety culture and ergonomics of the*

*physical demands on all workers in the construction industry would bring changes in the workers attitude and improved the site productivity in Nigeria.*

**Key words:** Construction, culture, ergonomics, policies, safety, physical demands.

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## 1. INTRODUCTION

The essence of safety in construction is to preserve the life of workers and property. The construction industry is the hub of social and economic development in all countries of the world, Agwu, & Olele, 2014 [1]. Though, the construction industry contributed only about 1.98% of the total Gross Domestic Product (GDP) to the Nigerian economy in 2009, its importance and roles in the development of the economy of any nation can never be disputed. However, when compared with other labour intensive industries, construction industry has historically experienced a disproportionately high rate of disability injuries and fatalities for its size Agwu, & Olele, 2014 [1]. Culturally, construction remains an industry where workers may feel that taking risks is a part of the job and may worry about what their peers think of those who take extra precautions. The reality is that construction workers are more exposed to workplace injuries because of the inherent dangers of a job that often involves working with large machinery and power tools, [2]. Safety performance on construction sites is usually measured using lagging indicators such as accidents and not by using leading indicators such as safe work behaviors. Traditionally, safety in construction sites has always been measured by the level of implementation of safety rules and procedures, and hazard control mechanisms. Recent advancements in construction safety such as the move towards safety culture and behavior-based safety have proven to generate better results [3]. Safety culture is when safety is the priority concern of people working in an organisation; however, stressing that an organisation can only be identified with safety culture after it has developed to a certain stage [4]

### 1.1. Construction safety policies in Nigeria

Occupational health and safety programmes were first introduced in Nigeria during the time the colonial days Ekhaese, Amole and Izobo-Martins (2017) [5] in Nigeria, almost all existing regulations on safety originated from foreign countries without putting into considerations the culture and life style of the people. This initiative led to legislation that included the Labour Act of 1974, the Factories Act of 1987 and the Workman's Compensation Act of 1987. Other relevant acts to occupational health and safety in Nigeria are Labour Acts 1990 and Workman's Compensation Act, 2004 of the laws of the Federation of Nigeria [4]. The 1987 Factory Act, which is the most popular safety regulation, was adapted from the 1961 Factory Act of Great Britain. The 1970 Occupational Safety and Health Act which is another safety document of reference in Nigeria has its origin and even application in the United States of America (US) and it is administered by the Occupational Safety and Health Administration (OSHA) of US Department of Labour. The Manual Handling Operations Regulations of 1992, the New Construction Design and Management Regulations of 1994 and similar others of reference in Nigeria are products of foreign countries [6].

## **1.2. New Trends in Construction Safety in Nigeria**

Present-day construction is marked by rapid execution of projects and the extensive use of machinery and mechanized production processes [8]. Today, building a safer workplace and industry, requires constant effort and continual improvement, but the result is well worth the investment of time, resources and money. More construction companies are retaining a larger portion of the risk through higher deductibles, and can expect to bear significant costs for any accident involving bodily injury [2]. According to [9], in Nigeria, the major concern in most of the occurring accidents, is the apparent disregard of safety and health standards by the employers and workers. More importantly, many of the accidents that occurs on sites were preventable and the deaths avoidable. The Ministry has the following activities in place to enforce OSH (Organisational Safety and Health) standards: routine inspection of workplaces, safety and health trainings/workshops, awareness creation e.g. celebration of World Day for Safety and Health at work, capacity building of staff of the Ministry on safety and health, provision of Information, Education and Communication (IEC) materials on safety and health issue, provision of enough sanctions in the labour legislations to serve as deterrent to non-compliant factory occupiers, provision of an occupational safety and health policy that will provide the enabling environment for safety and health delivery, provision of inspection vehicles for effective coverage of workplaces, evaluation of workplace statistics for effective planning, prosecution of safety measures defaulters, payment of workmen's compensation, prohibition of hazardous processes, closure of workplaces where an occupier is non-compliant and Investigation and analysis of industrial accidents. OSH (Organisational Safety and Health) is a health care function that impacts directly on the national strategy for poverty reduction and sustainable development. It is obvious that policies are in place but the centre needs capacity building and technical support to meet these challenges [9].

## **1.3. Benefits of reducing physical demands on construction workers**

Because of the physical demands of the work, construction workers who are employed have to be healthier than the general population, but the same physical demands cause workers with injuries or illness to leave the industry. We know that 10 percent of construction workers do not return to work after an injury, and that construction workers with a musculoskeletal disorder (MSD), lung disease, or injury are more likely to retire on disability than workers with the same conditions in less physically demanding work [10]. Even without an injury or an MSD, construction workers have a high risk for serious diseases down the road. Construction workers in the United States have the highest rate of smoking among all occupations, at 37.7 percent, compared to a national average of 22 percent, carrying a risk for lung cancer and chronic lung disease [10]. Workers are exposed to physically demanding repetitive work, poor work postures and handling of heavy loads at least half of the working time. The physical requirements were as common for the older and younger (less than 45 years of age) workers. The physical demands were most common in small scale projects as there is less provisions for the use of machinery [11]. Evidences has shown that construction work includes a lot of material handling, awkward posture, and other physical demands, many construction workers also develop work-related MSDs, such as chronic low back pain or shoulder problems. If one looks at the increasing age of workers in this industry, the likelihood of a construction worker developing an MSD or other chronic disease, combined with the industry characteristics mentioned, one can anticipate a shortage of experienced workers in the next decade [8].

#### **1.4. Construction safety, workers, organisations and third party (social sphere)**

According to [12], the effect of safety in construction, on health and the surrounding environment would vary from particular operations starting with extraction of building materials from quarries and methods by which the extraction is occurring, transportation, preparation of building materials at site and construction of works processes. There are few companies in Nigeria who recognize occupational health and safety, majority of such are the big multinationals; they are actually running the policies as constituted in Nigeria. However, occupational health and safety practice is still at infancy in most indigenous organizations in Nigeria [4]. Looking at the happening around us, it would be essential that highest priority on the health and safety of all employees, subcontractors and contractual partners, as well as the people and the environment that may be affected by the company's sphere of activity needs to be implemented. For appropriate safety measures and cultures organisations may need to invest heavily in the ongoing training of its workforce. The company dedicates the resources necessary to promote increased Health, Safety and Environment awareness, based on best practice standards, at all levels within the organization. In some multinational company, they have proactively removed and reduced potential hazards and therefore the risk is limited, Residual hazards are identified and mitigated through programs for incident prevention, assessment and analysis [13]. From the study, it has been observed that almost all existing regulations on safety originated from foreign countries. While this is a good initiative, it is about time we come up with more specific, transparent, simple and permanent policy peculiar only to our country. Interestingly, there has been more awareness and attention paid to safety and its policies in construction in recent times but it is mostly the big companies and multinationals that proactively reduce hazards and avoid health and safety risks of their workers in construction.

## **2. DATA USED**

The quantitative design approach was used for the research (Similar to Izobo-Martins et al 2018) [7]. A well-structured questionnaire was the instrument of data collection. Data for the study is collected through the use of questionnaires and interviews based on the construction of ten (10) units senior staff bungalows at Asaba campus of Delta state university. A total of one hundred (100) questionnaires were shared, ten (10) questionnaires to ten (10) workers under each of the ten (10) contractors handling the construction of the 10 units of senior staff bungalows at Asaba campus of Delta state university. The questionnaires were basically measuring the level of adherence to safety on site, the risks, the frequency of occurrence of site accidents and how it affects the workers and the level of delay in construction, due to extension of time

## **3. RESULTS AND DISCUSSION**

In this study, the site condition in relation to accidents were investigated from the point of view of architects and other professionals on site in Nigeria. The result of the investigation are as follows;

### **3.1. Work Experience of the respondents**

Result depicted in Table 1 showing, majority of the worker to have working experience of 11-15 years.

**Table 1** Work Experience of the respondents

Experience	Frequency	Percentage
1-5	14	14
6-10	28	28
11-15	42	42
16-20	11	11
21 and above	5	5

Source: Author's Survey, 2014

### 3.2. Ranking of Most Frequent Accidents on Site

Most frequent accident on site, Table 2 shows the ranking of the most accident that usually occur on the site. From the respondent the three most ranked accidents are scaffolding accidents, falls from ladders, and Lift & crane equipment.

**Table 2** Work Experience of the respondents

Description of Accident	Mean	Ranking
Scaffolding accidents	4.2037	1st
Falls from ladders	4.1388	2nd
Lift & crane equipment accident	4.0370	3rd
Electric shock injury	4.0185	4th
Welding accidents	4.0000	5th
Accidents from faulty machinery	2.9166	6th
Forklift truck accidents	2.6203	7th
Holes in flooring	2.4074	8th

Source: Author's Survey, 2014

### 3.3. Workers Involvement in Safety Education and Training

The knowledge of people about safety was investigated from the interview with the site heads.

**Table 3** Workers Comprehension of Safety Measures on Site

S/N	Description	Yes (%)	No (%)
1	Existence of Health and Safety Insurance	40	60
2	Payment of Health and Safety Insurance to accident victims	40	60
3	Compliance to Health and Safety Plan	30	70
4	Safety Education and Training for Workers	50	50
5	Existence of Safety Culture in Workers Attitude	80	20
6	Unsafe Acts Resulting in Fatalities	40	60
7	Poor Management Commitment to Safety	60	40

### 3.4. Discussion

- a. More than half of the respondent have over one decade of working experience as a site worker.
- b. They have all witnessed or experienced one accident or the other before on the site.
- c. Majority of their employers do not have any health insurance in place for their workers.
- d. Majority of their employers do not make payment benefits related to Health and Safety.
- e. The workers keep risking their life by working in an unsafe environment because of chronic un-employment.

It may be concluded that effective Health and Safety practices for site workers in Nigeria are yet to be fully activated.

#### 4. CONCLUSIONS

In the study it was noted that according to [8], in Nigeria, the major concern in most of the accidents, is the apparent disregard of safety and health standards by the employers and workers. Also, in cases where proactive measures have been put in place to rectify the situation it has been fairly effective. It is believe that the better way to push forward a safety culture is to enforce the write up of a safety plan attached to the contractors' construction methods in the preconstruction stage. Once a safety plan is drawn up by the contractor, this should be legally binding and be part of contract documents. The contractor should be held liable in case of disregard, accidents and other risk occurrences. If this move is put forward strictly by the approval bodies, such as professional bodies, Building and Construction agencies and others. There will be less safety problems on construction sites and the workers will benefit from this. Once these are done, there would be improved workers attitudes, safety culture and ergonomics of the physical demands on all workers in the construction industry in Nigeria.

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