Knowledge and Practice of Occupational Hazard Control among Building Construction Workers in Port Harcourt Metropolis of Rivers State

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Abstract

This study investigated the knowledge and practice of occupational hazard control among construction workers in Port Harcourt metropolis of Rivers State. Nine research questions and six hypotheses were formulated to achieve the aim of the study. The population for the study comprised of all the construction workers in all the building construction sites in Port Harcourt metropolis in Rivers State. A descriptive cross- sectional survey design was adopted as the research design for this study. A multistage sampling procedure was adopted to select a sample of 500 for the study. The instrument for data collection was a self-structured questionnaire with a reliability coefficient of 0.90. Data collected was analyzed using Statistical Package for Social Science (SPSS) version 20. Statistical tools such as percentage, Pearson's correlation, binary logistic regression and Chi-square were used for relevant variables. The findings of the study showed that 70.2% of the respondents had good knowledge of occupational hazard control. The findings on the practice of occupational hazard control showed that majority (92.2%) of the respondents always keep working material and equipment in good condition and more than three quarter (79.7%) always maintain good housekeeping, more than half (56.8%) use protective materials sometimes, 52.7% rarely use mask while mixing or demolishing and 55.3% always wear foot protection. Educational background was found to have a moderately negative relationship with both knowledge and practice of occupational hazard control. On bivariate analysis the study shows educational background has statistically significant relationship with knowledge of hazard control ($X^{2=}$ 133.660, df= 3, P=0.000) and practice ($X^{2=}$ 138.534, df= 3, p = 0.000). Age was also found to have statistically significant ($p<0.05$) relationship with both knowledge and practice. It was concluded that workers on construction sites have good knowledge and good practice of occupational hazard control. Factors such as educational status, age, training and years of experience influence their knowledge and practice of occupational hazards control. It was recommended that, the effort of the ministry of work and public health professionals at preventing occupational diseases among workers should include education and training for both informal and formal workers on construction sites.

Keywords: *Construction, Hazard Control practices, Knowledge, Port Harcourt*

Introduction

Occupational hazard control has been a major concern for safety professionals especially in developing nations like Nigeria. The phrase" safety first" as used by so many extractive, manufacturing and construction industries is one that was born out of the need for the safety of the worker and the work to be guaranteed during and after work process. This is because any damage or harm done to either the worker or the work as a result of hazard induced accident will automatically stop the construction process for a considerable period of time. Occupational accident, in particular has been reported to be one of the major causes on industrial hazards especially in the building construction industry.

According to Anupama and Pratibha, (2007), safety is the state of being certain that adverse effect will not be caused by some agents under defined condition and any method or technique or process which can minimize unwanted events (accidents) in an industrial concern may be referred to as a method, technique or process of industrial safety. Industrial safety is the science and art of identifying, evaluating and controlling workplace hazard. It Includes measures to prevent human exposure to chemical and physical agents as well as faulty or unsafe work practices. It is concerned with the safety of workers' life and the work itself as well as the situation of development and stability. Safety is not a matter of chance, it is something that the employees have the right to expect from their employers (Anupama & Pratibha, 2007). Almen, Larsson, and Thunqvist, (2012) defined hazard as a potential source of harm or an adverse health effect on a person or persons. Anupama and Pratibha, (2007) opined that industrial hazard is any potential condition which might be converted into an accident.

Statement to the Problem

The building construction industry is one that harbors several forms of potential hazards. These hazards includes among others exposure to sharp injurious objects, potential fall from heights, collapse of portions or complete buildings, inhaling of fumes and dust particles, exposure to chemicals etc. The safety of the workers in building construction industry is as important as the safe and smooth completion of the work that is been embarked upon. To guarantee the safety of the workers of building construction industry, there is need for a holistic practice of occupational hazard control by the employers and the employees alike. It has however been observed that majority of the workers in the building construction sites do not possess the needed knowledge of occupational hazard control, thus could not effectively practice the control of the potential hazard that are inherent in the industry.

Series of studies have attempted to find out the causes of accidents among building construction workers and remedies to them in view of safeguarding the life of the workers and the work itself during work processes, but only a few have studied on the need for the workers to possess the prerequisite knowledge of the hazard control measures and the actual practice of these occupational hazard control. This study is however set to inestigate the knowledge and practice of occupational hazard control among building construction workers in Port Harcourt metropolis in Rivers State.

Research Questions

This study provides answers to the following questions:

1. What is level of knowledge of building construction workers regarding occupational hazard control in Port Harcourt Metropolis of Rivers State?
2. What is the practice of occupational hazard control among building construction workers in Port Harcourt Metropolis of Rivers State?
3. What is the relationship between knowledge of occupational hazard control und educational background among building construction workers in Port Harcourt Metropolis of Rivers State?
4. What is the relationship between knowledge of occupational hazard control and age of building construction workers in Port Harcourt Metropolis of Rivers State? :
5. What is the relationship between knowledge of occupational hazard control and years of experience among building construction workers in Port Harcourt Metropolis of Rivers State?

Hazards

According to Achalu (2000), a hazard is an agent which has the potential to cause harm to a vulnerable target. The terms "hazard" and "risk" are often used interchangeably. However, in terms of risk assessment, they are two very distinct terms. A hazard is any agent that can cause harm or damage to humans, property, or the environment. Risk is defined as the probability that exposure to a hazard will lead to a negative consequence, or more simply, a hazard poses no risk if there is no exposure to that hazard.

It is a state, physical or chemical having potential to injure a person or leading to impairment of health. Risk or danger arises out of hazards and can be grouped into chemical, mechanical, biological, environmental or physical, electrical, and fire hazards. "Hazard and Risk" are often used interchangeably. Workers of building construction sites are generally exposed to an excessive risk of being injured at work. Almen et al, (2012) argued that construction industry is unique and complex as compared with other industries and it contains a wide range of construction materials and products, building services, manufacturers, contractors, sub-contractors, design, operation and refurbishing services. These complexities make the construction industry as one of the most hazardous industries that causes high rate of industrial accident.

Occupational Hazard

An occupational hazard as seen by Centre for Disease Control (CDC) (2015). Is a hazard experienced in the workplace? Occupational hazards can encompass many types of hazards, including chemical hazards, biological hazards, (bio hazards), psychological hazards and physical hazards. In the United States, the national institute for occupational safety and Health (NIOSH) conduct .work place investigation and research addressing work place health and safety hazard resulting in guidelines (CDC, 2015). In the EU a similar role is taken by EU-OSHA.

Chemical Hazards

Chemical hazards are a subtype of occupational hazards that involve dangerous chemicals. Exposure to chemicals in the work place can cause acute or long term detrimental health effects. This is evidence that workplace exposure to hazard such as silica dust, engine exhaust or welding fumes, among other are associated with increase valence of heart disease (CDC, 2015), other workplace have been shown to high i pressure (CDC, 2015).

Biological Hazards

Biological agents, including microorganism and toxins produced by living n can cause health problem in workers. Influencing an example of a bio hazard effects a broad population of workers in building construction sites (CDC, 2015). Those who work out doors encounter numerous biological hazards, including bites and strings from insect's spiders, snakes and scorpions. According to NIOSH, outdoor workers at risk for these hazards, include farmers, foresters, landscapes, grounds keepers, gardeners, painters, roofers, payers, construction worker, laborers, mechanic and other workers who speed time outside (CDC, 2015).

Psychosocial Hazards

Psychosocial hazards are occupational hazards that affect someone's social life or psychological health. Psychosocial hazards in the workplace include occupational burn out and occupational stress which can lead to burn out (CDC, 2015).

Physical Hazards

Physical hazards are a subtype of occupational hazards that involve environmental hazards that can cause harm with or without contact. Physical hazard include ergonomic hazards, radiation, heat and cold stress, vibration hazards, and noise hazards (CDC, 2015).

Ergonomic Hazards

Ergonomic hazards are physical conditions that may pose risk of injury to the musculoskeletal system (CDC, 2015) such as the muscle or ligaments of the lower back, tendons or nerves of the hands/wrist or bones surrounding the knees. Ergonomic hazards include things such as and ward or extreme posture, whole-body or hand/arm vibration poor designed tools, equipment, or workstation, Ergonomic hazards occurs in both occupational and non-occupational settings such as in workshop, building sites (CDC, 2015).

Building Construction Site

A construction site is a very dangerous environment if safety rules are not followed. An employee who is injured on the work site will claim worker's compensation and drive the rates up for the employees. This also puts pressure on the fewer employees and the same pressure in conveyed to the company in order to reach completion deadlines. Accidents in the construction site due to poor safety practice are a loss for both the employer and the employee, and are best avoided by observing the use of common safety practices. Occupational safety and health (OSHA) www.osha.gov.

The international labour organization (ILO) estimates at least 60,000 fatal accidents a year on construction sites around the world that is one in six of all fatal work-related accidents (BLS, Bureau of Labour Statistics U.S. Department of Labour 2003).

Knowledge of Workers in Construction Site

According to Wikipedia, knowledge is a familiarity, awareness or understanding of something, such as facts, information, descriptions, or skills, which is acquired through experience of education by perceiving, discovering or learning. It can refer to a theoretical or practical understanding of a subject, course, profession or skill. Knowledge can be implicit, as with practical skill or expertise and it can also be explicit, as with the theoretical understanding of a subject. It can be more or less formal or systematic as its acquisition involves complex cognitive processes like perception, communication and reasoning. In the views of Agwu, (2014), several building construction site workers do not have the pre-requisite knowledge of the required measure needed to effectively control hazards in their work sites. Agwu pointed out that this phenomenon is not different with many employers of labour in these building construction sites as many of them lacks the knowledge of what measure they should put in place to forestall accident arising from hazards in the sites. Acquiring this knowledge will go a long way in positioning them for the actual practice of occupation hazard control in the building construction sites.

Several studies have been done on the need for health and safety management practices in the building construction industry but only a few was centered on the acquisition of knowledge that will translate to the actual practice of occupational hazard control. Olusoga and Fagbemi, (2018) conducted a study on health and safety management practices in the building construction industry in Akure, Nigeria. A total of 110 workers of building construction site which include Architects, Engineers, Building contractors, Project managers and quantity surveyors participated in the study. The result showed that a large portion of the workers are not aware of the safety management practices obtainable within their respective companies which in turn makes them believe that they have to take care of themselves when accidents occur.

Practice of Workers in Construction Site

According to the Collins online dictionary (2018), practice means doing something regularly in order to be able to do it better. It could be said to be repetition or exercise of an activity in order to achieve mastery and fluency and a condition of having mastery of a skill or activity through repetition. Frequently practicing of acquired skill by application of the knowledge leads to proficiency in practice. This implies repeated performance for the purpose of learning or acquiring proficiency. To control the occupational hazards in a building construction site, the actual performance or application of the stipulated hazard control measure is key and employees and employers alike ought to be ready to carry out in practice what they advocated in principle. Practice they say makes perfect, hence the continuous exercise of a profession and a systematic exercise for proficiency in the measures for the control of occupational hazards will in no doubt reduce the risk of accident or unwanted events in the building construction site (Merriam-Webster.com). Since it is believed that practice can make perfect, employers and safety personnel have to make sure that their workers have enough time to get comfortable with any new project before they utilize it. Before embarking on any new project, building construction workers should ensure that they set out enough side and time for practice so that workers are fully ready to reduce to the barest minimum any eventuality that might arise in the Construction processes (businessdictionary.com). How well a person improves with practice depends on several factors, such as the frequency of practice engagement, the knowledge of the person practicing

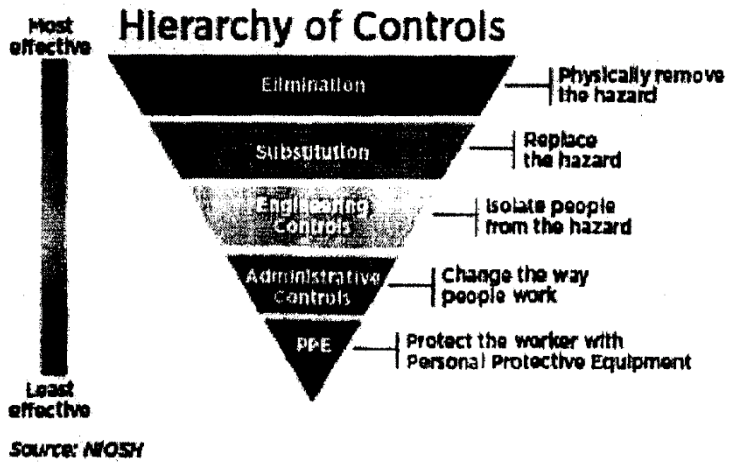
and the feedback that is available for improvement. If feedback is not appropriate (either from the instructor or from self- reference to an information source), then the practice tends to be ineffective or even detrimental to learning. Therefore, practice is often scheduled, to ensure enough of it is performed to reach one's training objectives. How much practice is required depends upon the nature of the activity and upon each individual as some people improve on a particular activity faster than others.

However, the practice of occupational hazard control which evokes the act of rehearsing a behavior over and over, or engaging in an activity again and again, for the purpose of improving or mastering the hazard control measures cannot be attained without first acquiring the knowledge of these occupational hazard control measures. To effectively implement or carry out occupational hazard control, it is of utrnost importance that both the employees and the employers have a sound knowledge of the required control measures necessary to eliminate or reduce hazards to the barest minimum. Aside possessing or acquiring the required hazard control measures, it is also vital for them to make the practice of the hazard control measures paramount in their daily routing work processes.

Hierarchy of Controls

To effectively control and prevent hazards, employers should: Involve workers, who often have the best understanding of the conditions that create hazards and insights into how they can be controlled, identify and evaluate options for controlling hazards, using a "hierarchy of controls." Use a hazard control plan to guide the selection and implementation of controls, and implement controls according to the plan. Develop plans with measures to protect workers during emergencies and non- routine activities. Evaluate the effectiveness of existing controls to determine whether they continue to provide protection, or whether different controls may be more effective. Review new technologies for their potential to be more protective, more reliable, or less costly (Belel & Muhmud, 2012).

Agwa, (2012) argued that, although, some hazard and their controls are specifically outlined in legislation. In all cases, the employer has a duty of due diligence and is responsible for 'taking all reasonable precautions, under the particular circumstances, to prevent injuries or accidents in the workplace'. In situations where there is not a clear way to control a hazard, or if legislation does not impose a limit or guideline, one should seek guidance from occupational health professionals such as an occupational hygienist or safety professional about what is the "best practice" or "standard practice" when working in that situation. A legal limit or guideline (such as an exposure limit) should never be viewed as a line between "safe" and "unsafe". The best approach is to always keep exposures or the risk of a hazard as low as possible. The control of occupational hazard could be done in the following ways otherwise known hierarchy of control:



Source: National Institute of Occupational Safety and Health

Elimination control is a hazard control strategy that is based on completely removing a material or process causing a hazard. It is the most effective of the five members of hierarchy of hazard control in protecting workers and where possible should be implemented before all other method. It is most effective early in the design process. It is more difficult to implement for an existing process, when major changes in equipment and procedure may be required. The strategy of elimination can fail if the hazardous process or material is reintroduced at a later stage in the design or construction phase. The complete elimination of hazard is a major component to the philosophy of prevention through design, which promotes the practice of eliminating hazard at the earliest design stages of a project. Complete elimination of hazard is often the most difficult control to achieve, but addressing it at the start of a project allows designers and planners to make large changes much more easily without the need to redo work. It is simply the removal of the hazard from the workplace (www.wikipedia.com).

Substitution control: Refers to the replacement of a hazardous material or process with one that is less hazardous. It could be likened to minimization of the potential posed by a hazardous material by scaling down the hazardous process. Substitution is usually the least expensive and most positive method of controlling hazard and should always be the first engineering hazard control measure considered (Anupama & Pratibha, 2007). According to the Wikipedia, hazard substitution is a hazard control strategy in which a material or process is replaced with another that is less hazardous. It is the second most effective of the five members of the hierarchy of hazard control in protecting workers after elimination. Like elimination, substitution is the most effective early in the design process when they may be inexpensive or easy to implement. Hazard substitution can involve not only changing one material for another but also using the same material in a less hazardous form. In making a substitution, the hazard of the new material should be considered and monitored so that a new hazard is not unwillingly introduced causing regrettable substitutions. (www.wikipedia.com).

Engineering Controls: includes designs r modifications o plants, equipment, ventilation systems, and processes that reduce the source of exposure. Engineering 1-lazard Control, according to Anupama and Pratibha, (2007) may be defined as an installation of equipment, or physical facilities including, if necessary, the selection and arrangement of experimental equipment. Engineering control remove the hazard, either by initial design specifications or

by applying methods of substitution, minimization, isolation, or ventilation. Engineering control are the most effective hazard control methods, especially when introduction at the conceptual stage of planning when control measure can be integrated more reading into the design. They tend to be more effective than other hazard controls (administrative controls and personal protective equipment) because they remove the source of the hazard or reduce the hazard rather than lessen the damage that may result from the hazard. They are also less dependent on the chemical user who, unfortunately, is subjected to all of the frailties which befall humans (eg forgetfulness preoccupation, insufficient knowledge).

Administrative Controls: Anupama and Pratibha (2007) stated that they are controls that alter the way the work is done, including timing of work, policies and other rules, and work practices such as standards and operating procedures (including training, housekeeping, and equipment maintenance, and personal hygiene practices). It consists of management efforts to reduce hazard through planning, information and training (eg hazard communication), written policies and procedures (i.e. the chemical hygiene plan), safe work practices and environmental and medical surveillance e.g workplace inspections equipment preventive maintenance, and exposure monitoring. It encompasses training, procedure, policy, or shift design that lessen the threat of a hazard to an individual. This method of occupational hazard control typically changes the behavior of people (e.g building construction workers) rather than removing the actual hazard or providing personal protective equipment (PPE).

Personal Protective Equipment (PPE) Control: They are equipment worn by individuals to reduce exposure such as contact with chemicals, sharp objects or exposure to noise. When effective work practices or engineering control are not feasible or while such control are being instituted, appropriate personal protective equipment are used .personal protective equipment include article to protect the eyes, skin and respiratory tract (e.g goggles, face shield, coat. gloves, aprons, respiratory. PPE refers to protective clothing, helmets, goggles or other garment or equipment designed to protect the wearers body from injury. The hazard addressed by PPE include: physical, electrical, heat, chemical, biohazards and airborne particulate matters (Anupama & Pratibha, 2007).

Safety Culture

Safety culture is held in high regard within the construction industry It is described as the product of individual or group values. Attitudes, perception and patterns of behaviour determine the commitment to, and proficiency of an organizations health and safety management (Health and Safety, 1993). Zou, Zhang & Wang (2007) defied safety culture also as an agstomerarion of individuals as well as group that are concerned win abating the risks and exposure of workers and the public to unsafe acts and conditions in a construction environment- This goes to show that for an effective safety culture, all organization members must share a set of belief about risk as well as accidents. Culture is seen to have a hand in accident causation which is predicated on the obvious migration of construction workers across developed cocaine of the world. This was stressed by Baich and Geddes Kolo (2015) that a structurally embedded reliance on cheap and flexible sources of regularly and irregularly employed new workers has always been a key feature of the construction sector. The way of life of people differs from place to place which in rum take its toll on construction work. Alhajeri (2011) opined that the importance of culture to health and safety management cannot be overemphasized because it does help in understanding the different approaches to accident prevention. The different characteristics that help to identify culture

which ranges from: Culture being a system of values- Culture influencing beliefs, attitudes, perception, and behavior, and Culture distinguishing one group from another.

Accident causes are ironically known to au building construction employers and also almost preventable but as other business issues, occupational safety and health can be managed in the enterprise (Indian Council of Medical Research, 2003). Human factory Mechanical factors, and Environmental factors are also seen to be important factors that causes accident, it can be seen as discussed by several authors that the issue of OHS encompasses a whole lot which is not limited to wearing Personal Protective Equipment alone. It is a philosophy that discourages work practices that place individuals at risk of injury and the integration of Health and safety into the daily work process. Construction accidents according to the Workmen's compensation decree of 1987 include but not limited to; Permanent partial incapacity - Permanent total incapacity, temporary incapacity and fatal accidents, where death results.

Research Design

This study adopts a descriptive, cross-sectional survey design. According to Elendu (2010), descriptive survey explains, describe and analyze information generated from the respondents at a particular occasion or period of time in their natural setting. This design is aimed at explaining and describing the behaviour of workers regarding hazard control. However, this design was successfully used by Adebola (2014) on the knowledge, attitude, and compliance with occupational health and safety practice among pipeline product and marketing company in Lagos State which was similar and related to the current study.

Population of the study

The population of the study comprised of all the construction workers in all the building construction sites in Port 1-larcourt metropolis of Rivers State.

Sample and Sampling Techniques

The sample size comprised of 500 workers. Multistage sampling procedure was adopted for the study. The first stage involved the used simple random technique to select 10 locations in Port Harcourt Metropolis such as Rumuokuta, Oyigbo, Rukpokwu, Akpajo, Rumuolumeni, Elelenwo, lgwuruta, Choba, Rumuokwurus. In stage two (2) stratified proportionate sampling techniques was used to select five (5) construction sites in each location. At the last stage (stage 3), purposive sampling techniques was used to select (10) workers from each sites for the study.

Method of Data Analysis

The data collected by the researcher from the field through the use of the instrument was coded in the Statistical Package for Social Sciences (SPSS) for analysis. The research questions 1 and 2 were answered using frequency and simple percentage. Research questions 3 to 9 were answered using Pearson's correlation. While the hypotheses were tested using binary logistic regression and chi-square statistics set at 0.05 level of significance.

The guide for interpreting the nature of relationship was adopted from Elendu (201 0). The criteria for deciding the nature of relationship are as follow: 0.00-0.19 indicates very low relationship (No relationship for 0.00), 0.20-0.39 indicates low relationship, 0.40-0.59 indicates moderate relationship, 0.60-0.79 indicates high relationship, and 0.80-1 .00 indicates very high relationship.

Presentation of Data

Table 41: Socio-demographic characteristics of respondents

Items	Frequency (F)	Percentage (%)
Gender		
Male	411	95.2
Female	18	3.9
Non responses	4	.9
Total	**463**	**100.0**
Age		
18-25	106	22.9
26-35	179	38.7
36-45	86	18.6
46-55	88	19.0
Non responses	4	.9
Total	**463**	**100.0**
Years of working experience		
1-5	156	33.7
5-10	171	36.9
11-15	106	22.9
16 above	28	0.6
Non responses	2	.4
Total	**463**	**100.0**
Position at work		
Architect	88	19.0
Bricklayer	84	81.1
Labourer	162	35.0
Carpenter	91	19.7
Iron bender	34	7.3
Non responses	4	29
Total	**463**	**100.0**
Educational status		
Primary	73	15.8
Secondary	268	57.9
Tertiary	108	23.3
No formal education	10	2.2
Non responses	4	.9
Total	**463**	**100.0**
Training		
Self	140	30.2
Roadside	115	24.8
Company	204	44.1
Non responses	4	.9

Total	**463**	**100.0**

Table 4.1 reveal the socio-demographic characteristics of respondents. Majority 441(95.2%) were males while 18(3.9%) were females. 179(38.7%) were within the age of 26-35 years, 106(22.9%) were aged 18-36-25 years, 86(18.6%) were aged 36- 45 years and 88(19.0%) 46-55 years. 171(36.9%) had 5-10 years of working experience, 156(33.7%) had 1-5 years, 106(22.9%) had 11-15 years and 28(6.0%) had >16 years of working experience. 162(35.0%) were labourers, 91(19.7%) were carpenters, 88(19.0%) were architect and 84(18.1%) were bricklayers. More than half 268(57.9%) had secondary education and 108(23.3%) had tertiary education.

204(44.1%) were trained by a company, 115(24.8%) had roadside training while

410(30.2%) had self-training.

Research question 1: What is the knowledge level of building construction workers (BCW) regarding occupational hazard control in Port 1-larcourt Metropolis of Rivers State?

Table 4.2: Knowledge of occupational hazard control

Knowledge*	**Score**	**Frequency**	**Percentage**
Good	10-15	325	70.2
Poor	0-5	138	29.8
Total	15	463	100.0
Mean knowledge = 11.94±2.74			

Table 4.2 revea1 the knowledge of occupational hazard control among respondents.

The table showed that that 325(70.2%) of the respondents scored between 10-1 5 which is 70% of the total knowledge score which was assumed to be good knowledge and 138(29.8%) scored 5 or less which was assumed to be poor knowledge. Based on the mean knowledge of hazard control, respondents are said to have good knowledge (70.2%).

Research question 2: What is the practice of occupational hazard control among building construction workers in Port Harcourt Metropolis of Rivers State?

Table 4.3: Practice of Occupational Hazard Control

Items	**Always F (%)**	**Sometimes F (%)**	**Rarely F (%)**	**Never F (%)**
Use of protective materials in the workplace.	188(40.6)	263(56.8)	10(2.2)	2(0.4)
Having too box meetings at the working site.	174(37.6)	24(5.2)	103(22.2)	162(35.0)
Use of mask while mixing or demolishing.	172(37.3)	18(3.9)	243(52.7)	28(6.1)
Wearing foot protection.	255(55.3)	194(41.1)	4(0.9)	8(1.7)
Washing of hands with soap before eating in the work site.	387(83.6)	68(14.7)	4(0.9)	4(0.9)
Keeping working material and equipment in good condition.	427(92.2)	31(6.8)	0(0.0)	5(1.0)
Good housekeeping at site.	369(79.7)	90(19.4)	0.(0.0)	4(0.9)
Surveying site condition before commencing work.	260(56.1)	191(41.4)	6(3.1)	4(1.1)
Use of goggle while standing to inspect work on site.	62(13.4)	231(49.9)	136(29.4)	34(7.3)

Use of mask while sanding or drilling.	130(28.1)	163(35.2)	140(30.2)	30(7.3)
Use of ladder for all up works.	211(45.6)	178(38.4)	70(15.1)	4(0.9)
Use of respirator.	8(1.7)	158(34.3)	32(6.9)	263(57.0)
Use of fall-arrest harness system while using ladder.	130(28.1)	70(15.1)	243(52.4)	2(0.4)
Wearing hard hat.	158(34.1)	285(61.6)	12(2.6)	4(0.9)
Performing regular checkup.	170(36.9)	42(9.1)	239(51.8)	10(2.2)
Refuse to do job that is exposed to danger.	104(22.5)	14(3.0)	74(16.0)	271(58.5)
Use of impact harmers.	12(2.6)	92(19.9)	98(21.2)	216(56.4)
Have two or three breaks before the close of works.	86(18.6)	335(72.4)	38(8.2)	4(0.9)
Reports accident to the supervisor.	110(23.8)	327(70.6)	26(5.6)	0.(0.0
Use wheelbarrow for transporting cement/mortar.	106(22.9)	319(68.9)	36(7.8)	2(0.4)

Table 4.3 reveal the practice of occupational hazard control among building construction workers. The highest proportion in each of the items show that 263(56.8%) use protective materials sometimes, 174(37.6%) have tool box meeting at the worksite always, 243(52.7%) rarely use mask while mixing or demolishing, 255(55.3%) always wear foot protection, 387(83.6%) always wash their hands with soap before eating in the work site, 427(92.2%) always keep working material and equipment in good condition, 369(79.7%) always maintain good housekeeping, 260(56.1%) always survey site condition before commencing work. Close to half 170(36.9%) always perform regular check-up, 335(72.4%) sometimes take break two or three breaks before the close of works, 327(70.6%) report accident to the supervision sometimes and 319(68.9%) sometimes use wheelbarrow for transporting cement/mortar.

Research questions 3: What is the relationship between knowledge of occupational hazard control and educational background among building construction workers in Port Harcourt Metropolis of Rivers State?

Table 4.4: Relationship between knowledge of occupational hazard control and educational background

Educational background	Knowledge		Total	r-value	Decision
	Good	Poor			
Primary	20(27.4)	53(72.6)	73(100)	-0.428	Moderate
Secondary	187(69.8)	81(30.2)	268(100)		
Tertiary	108(100)	0(0.0)	108(100)		
No formal education	6(60.0)	4(40.0)	10(100)		
Total	321(69.9)	138(31.1)	459(100)		

*Moderate relationship

Table 4.4 show the relationship between knowledge of occupational hazard and educational background among building construction workers in Port Harcourt Metropolis. The result reveal that 1 87(69.8%) of the respondents who had secondary education, 20(27.4%) who had primary education and all the respondents who had tertiary education had good knowledge of occupational hazard. The result of the study further shows a negatively moderate relationship between knowledge of occupational hazard and educational background (r-value -0.428).

Research questions 4: What is the relationship between knowledge of occupational hazard control and age of building construction workers in Port Harcourt Metropolis of Rivers State?

Table 4.5: Relationship between knowledge of occupational hazard control and age of respondents

Age	Knowledge		Total	r-value	Decision
	Good	Poor			
18-25	12(11.3)	94(88.7)	106(100)	-0.647	Higher
26-35	135(75.4)	44(24.6)	179(100)		
36-45	86(100)	0(0.0)	86(100)		
46-55	88(100)	0(0.0)	88(100)		
Total	321(68.9)	138(30.)	459(100)		

*High relationship

Table 4.5 show the relationship between knowledge of occupational hazard and age of building construction workers in Port Harcourt Metropolis. The result reveal that about three quarter 135(75.4%) of the respondents who were aged 26-35, 12(11.3%) aged 1 8-25 years, ad all the respondents aged 36-45 and 46-55 years had good knowledge of occupational hazard. The result of the study further shows a negatively high relationship between knowledge of occupational hazard and age of respondents (r-value -0647).

Research questions 5: What is the relationship between knowledge of occupational hazard control and years of experience among building construction workers in Port Harcourt Metropolis of Rivers State?

Table 4.6: Relationship between knowledge of occupational hazard control and years of experience

Years of experience	Knowledge		Total	r-value	Decision
	Good	Poor			
1-5	48(30.8)	108(69.2)	156(100)	0-567	Moderate
5-10	143(83.6)	28(16.4)	171(100)		
11-15	104(98.1)	2(1.9)	106(100)		
≥16	28(100)	0(0.0)	28(100)		
Total	232(69.9)	138(30.1)	461(100)		

*****Moderate relationship

Table 4.6 show the relationship between knowledge of occupational hazard and years of experience among building construction workers in Port Harcourt Metropolis. The result reveal that majority 104(98.1%) of the respondents who had 11-15 years of working experience. 143(83.6%) of those who have 5-10 years of experience, 48(30.8%) and all the respondents who had worked 16 years had good knowledge of occupational hazard. The result of the study further shows a negatively moderate relationship between knowledge of occupational hazard and years of experience (r-value -0,567).

Research questions 6: What is the relationship between practice of occupational hazard control and educational background of building construction workers in Port Harcourt Metropolis of Rivers State?

Table 4.7: Relationship between practice of occupational hazard control and educational background

Educational background	Knowledge		Total	r-value	Decision
	Good	Poor			

Primary	0(0.0)	73(100)	73(100)	-0410	Moderate
Secondary	64(24.0)	203(76.0)	267(100)		
Tertiary	76(70.4)	32(29.6)	108(100)		
Non formal education	0(0.0)	10(100)	10(100)		
Total	140(30.6)	318(69.4)	458(100)		

***Moderate relationship

Table 4.7 show the relationship between practice of occupational hazard control and educational background among building construction workers in Port Harcourt Metropolis, 'l'he result reveal that 76(70.4%) of the respondents who had tertiary education, and 64(24.0%) who had secondary education had good practice of occupational hazard control. The result of the study further shows a negatively moderate relationship between practice of occupational hazard control and educational background (r-value = -0.4 10).

Research questions 7: What is the relationship between practice of occupational hazard control and training among building construction workers in Port Harcourt Metropolis of Rivers State?

Table 4.8: Relationship between practice of occupational hazard control and training

Training	**Knowledge**		**Total**	**r-value**	**Decision**
	Good	**Poor**			
Self	12(8.6)	128(91.4)	140(100)	-0.490	Moderate
Roadside	8(7.0)	106(93.0)	114(100)		
Company	120(58.8)	84(41.2)	204(100)		
Total	140(30.6	318(69.4)	458(100)		

***Moderate relationship

Table 4.8 show the relationship between practice of occupational hazard control and training among building construction workers in Port Harcourt Metropolis. The result reveal that more than half 120(58.8%) of the respondents who were trained by company, 12(8.6%) who trained their self and 8(7.0%) of those who had roadside training had good practice of occupational hazard control. The result of the study further shows a negatively moderate relationship between practice of occupational hazard control and training (r-value = -0.490).

Research questions 8: What is the relationship between practice of occupational hazard control and age of building construction workers in Port Harcourt Metropolis of Rivers State?

Table 4.9: Relationship between practice of occupational hazard control and age of respondents

Age	**Knowledge**		**Total**	**r-value**	**Decision**
	Good	**Poor**			
18-25	0(0.0)	106(100)	106(100)	-0.349	Low
26-35	70(39.1)	109(60.9)	179(100)		

36-45	20(23.3)	66(76.7)	86(100)
46-55	52(59.8)	35(40.2)	87(100)
Total	142(31.0)	31(69.0)	458(100)

***** Low relationship

Table 4.9 show the relationship between practice of occupational hazard control and age of building construction workers in Port Harcourt Metropolis. The result reveal that more than half 52(59.8%) of the respondents within the age of 46-55 years, 70(39.1%) aged 26-35, and 20(23.3%) aged 36-45 years had good practice of occupational hazard control. The result of the study further shows a negatively low relationship between practice of occupational hazard control and age (r-value = -0.349).

Research question 9: What is the relationship between practice of occupational hazard control and years of experience among building construction workers in Port Harcourt Metropolis of Rivers State?

Tale 4.10: Relationship between practice of occupational hazard control and years of experience

Years of experience	Knowledge		Total	r-value	Decision
	Good	Poor			
1-5	12(7.7)	144(92.3)	156(100)	-0.151	Very low
5-10	100(58.5)	71(41.5)	171(100)		
11-15	18(17.0)	88(83.0)	106(100)		
≥16	12(44.4)	15(55.6)	27(100)		
Total	142(30.9)	318(69.1)	460(100)		

*Very low relationship

Table 4.10 show the relationship between practice of occupational hazard and years of experience among building construction workers in Port Harcourt Metropolis. The result reveal that more than half 100(58.5%) of the respondents who had 5-10 years of working experience, 18(17.0%) of those who have 11-15 years of experience, 12(7.7%) and 12(44.4%) who had Z16 years of experience had good practice of occupational hazard control. The result of the study further shows a negatively very low relationship between practice of occupational hazard control and years of experience (r-value = -0.15 1)

Testing of Hypotheses

Hypothesis 1: There is no significant relationship between knowledge of hazard control and educational background of building construction workers in Port Harcourt Metropolis of Rivers State.

Table 4.11: Binary Logistic Regression analysis showing relationship between knowledge of hazard and educational background

Education	B	S.E.	Wald	df	Sig.	Odds ratio(OR)	95% C.I for OR Lower	Upper
Primary	Ref		37.90	3	.000			
Secondary	1.380	.697	3.922	1	.048	3.975	1.014	15.576
Tertiary	1.431	.659	.428	1	.513	.650	.179	2.364
Constant	-.405	.645	.395	1	.530	.667		

Table 4.11 shows the binary logistic regression analysis showing the relationship between knowledge of hazard control and educational background. On bivariate analysis the study shows a significant relationship between knowledge of hazard control and educational background (X2 133.660, df= 3, P0.000). On binary logistic regression the result of the study shows that respondents who had secondary education were significantly about 3 times (OR = 3.975: 95%CI = 1.014-15.576) more likely to be knowledgeable about hazard control compared to those who had primary education. The result of the study further revealed that as respondents increases in education knowledge of hazard control also increases. (B = 1.431).

Hypothesis 2: There is no significant relationship between occupational hazard control and age of building construction workers in Port Harcourt Metropolis.

Table 4.12: Binary Logistic Regression analysis showing relationship between knowledge of hazard and control and age

Age	B	S.E.	Wald	Df	Sig.	Odds ratio(OR)	95% C.I for OR Lower	Upper
18-25	Ref		81.45	3	.000			
26-35	23.26	42.59	11.32	1	.996	12.35	3.033	
36-45	20.08	42.59	.354	1	.996	52.09	23.114	96.22
46-55	.000	61.45	.017	1	1.00	1.000	.030	5.54
Constant	-212	42.59	.000	1	.996	.000		

Table 4.12 shows the binary logistic regression analysis showing the relationship between knowledge of hazard control and age of respondents. On bivariate analysis the study shows a significant relationship between knowledge of hazard control and educational background (X^2 = 286.758, df 3, p 0.000). On binary logistic regression the result of the study shows that respondents who were aged 26-35 years were non-significantly about 12 times (OR = 12.35: 95%CI = 3.033-48.02) more likely to be knowledgeable about hazard control compared to those who were aged 18-25 years.

Hypothesis 3: There is no significant relationship between knowledge of occupational hazard control and year of experience among building construction workers in Port Harcourt Metropolis.

Table 4.13: Binary Logistic Regression analysis showing relationship between knowledge of hazard control and years of experience

Years of experience	B	S.E.	Wald	Df	Sig.	Odds ratio(OR)	95% C.I for OR Lower	Upper
1-5	Ref		1.59	3	.000			

5-10	22.01	7.72	.000	1	.998	3.768	.032	6.72
1-15	19.57	7.72	.000	1	.998	3.085	1.32	5.91
≥16	17.25	7.72	.000	1	.998	2.767	.923	4.55
Total	-21.2	7.72	.000	1	.998	.000		

On bivariate analysis the study shows a significant relationship between knowledge of hazard control and years of experience (X^2 = 197.8 13, df = 3, p 0.000). On binary logistic regression the result of the study shows that respondents who had 5-10 years of experience were non-significantly about 3 times (OR=3.768: 95% C1= 0.032-6.72) more likely to be knowledgeable about hazard control compared to those who had 18- 25 years of experience. The result further revealed that as respondents' years of experience increase their knowledge of hazard control also increases (B = 17.25).

Hypothesis 4: There is no significant relationship between practice and age regarding occupational hazard control among building construction workers in Port Harcourt Metropolis.

4.14: Binary Logistic Regression analysis showing relationship between practice of hazard control and age of respondents

Age	**B**	**S.E.**	**Wald**	**Df**	**Sig.**	**Odds ratio(OR)**	**95% C.I for OR**	
							Lower	**Upper**
18-25	Ref		22.916	3	.000			
26-35	21.59	3.88	.000	1	.996	2.218	.000	
36-45	.839	.267	9.872	1	.002	2.313	1.371	3.904
46-55	1.59	.336	22.377	1	.000	4.903	2.537	9.474
Constant	-.396	.219	3.279	1	.070	.673		

On bivariate analysis the study shows a significant relationship between practice of hazard control and age ($X^{2=}$ 116.999, df 3, p = 0.000). On binary logistic regression the result of the study shows that those aged 26-35 years (OR 2.2 18: 95%C1 = 0.000) and those aged 36-45 years (OR =2.313: 95%CI 1.371-3.904) were about 2 times more likely to practice occupational hazard control compared to those aged 1 8-25 years. Those aged 46-55 years were significantly about 4 times (OR 4.903: 95%C1 2.5 37-9.474) more likely to practice occupational hazard control compared to those aged 18-25 years The result further revealed that as respondents' age increase practice of hazard control also increases (B = 1.59).

Hypothesis 5: There is no significant relationship between practice and training regarding occupational hazard control (OHC) among building construction workers in Port Harcourt Metropolis

Table 4.15: Chi-squared test showing relationship between practice of hazard control and training

Training	**Practice**		**Total**	**df**	**X^2-value**	**P-value**	**Decision**
	Good	**Poor**					
Self	12(8.6)	128(91.4)	140(100)				
Roadside	8(7.0)	106(93.0)	144(100)	2	138.445	0.000	Rejected
Company	120(58.8)	84(41.2)	204(100)				

Total	140(30.6)	31(69.4)	458(100)

P<0.05 *Significant

The null hypothesis states that there is no significant relationship between practice of occupational hazard control and training among building construction workers in Port Harcourt Metropolis. The finding of the study revealed a significant relationship between and training ($p<0.05$,df= 2, $X^2 = 138.445$). The null hypothesis is therefore rejected (Table 4.15).

Discussion of Findings

The findings of this study showed that the 70.2% respondents had good knowledge of occupational hazard control. The findings of this study is in keeping with that of Oluwafemi, Abiola, Akingbade and Faej (2017) were majority of the respondents were found to have good knowledge of occupational hazards control. The finding of this study is also in line with that of Amabye (2016) where majority of the workers (66.7%) had good knowledge of occupational health and safety practices. The finding of this study is similar to that of Milemal. Lillian, Gatebe and Eraste (2015) which showed that all the respondents in this study were very much aware of the existence of injuries and ailments associated with working in the construction sites. The reason attributed to the similarity found in the two studies is the similarity in the population studied and the sample size used in the two studies. The findings of this study is different from that of Peter and Olasumbo (2014) where the knowledge of safety practices was found to be poor. The findings of this study is different from that of Adewale and Adhuze (2017) which showed that majority of the respondents have poor knowledge of safety practices and hazard control at the construction site. This difference found between the present study and the previous one might be due to the difference in the study area, and the sample size. The findings of this study also differ from that of Vitharam, Subashe and Sudhira (2015) where poor knowledge was recorded. The fact that the previous study analysed data qualitative whereas the present study analyzed the data generated quantitatively might be implicated for the variations found between the two studies.

The findings of this study on the practice of occupational hazard control showed in table 4.3 that majority (92.2%) of the respondents always keep working material and equipment in good condition and more than three quarter (79.7%) always maintain good housekeeping. The finding of this study is akin to Adebola (2014) which showed that majority (90.0%) of the respondent comply with safe work practices and high proportion of (85.9%) have compliance with occupational hazards and safety procedure. The findings of this study also showed that more than half (56.8%) use protective materials sometimes, 52.7% rarely use mask while mixing or demolishing and 55.3% always wear foot protection. The findings of this study is different from that of Jasani, Joshi, Kartha, Mehta, and Shah (2016) where a lesser proportion (25%) of the respondents used one or other form of PPEs to prevent work related hazards and a higher proportion (74%) workers were using PPE irregularly. The findings of this study differs from that of Oluwafemi, Abiola, Akingbade and Faej (2017) where poor practice of occupational safety was recorded. The findings of this study is also different from that of Onowhakpor, Abusu; Adebayo, Esene, and Okojie (2017) where more than half (57.9%) of the respondents had poor work safety practice. The negligence of workers about their health status might be implicated for the poor occupational hazard control found among respondents.

The findings of this study showed in table 4.4 that there was a negatively moderate relationship between knowledge of occupational hazard and educational background (r-value = -0.428). On bivariate analysis the study shows a significant relationship between knowledge of hazard control and educational background ($X^{2=}$133.660, df= 3, P=0.000). The findings of this study gives credence to that of Adebola (2014) which showed that there is a statistical significant relationship between educational status and knowledge of occupational hazard (p=0.04) at 95% level of significance. The findings of this study is also similar to that of Amabye (2016) which showed that there was a significant association between knowledge of occupational hazards and educational status (p<0.00l).

The findings of this study showed a negatively moderate relationship between practice of occupational hazard control and educational background (r-value = -0.410). On bivariate analysis the study shows a significant relationship between practice of hazard control and educational background (X^2 = 138.534, df = 3, p 0.000). The findings of this study is similar to that of Amabye (2016) which showed a significant association between occupational hazards and educational status (p<0.001). The findings of this study also showed that 70.4% of the respondents who had tertiary education, and 64(24.0%) who had secondary education had good practice of occupational hazard control. This finding is in keeping with that of Adebola (2014) which showed that compliance to hazard control practice was quite high among those with post-secondary education and relatively low in respondents with secondary education and that there was a statistical significant relationship between educational status and practice at 95% level of significance p≤0.05. The similarity found in the present study and the previous ones might be due to the fact that education is helping to fill in gap in knowledge and the subsequent practice found among the respondents.

The findings of this study showed that about three quarter (75.4%) of the respondents who were aged 26-3 5 years had good knowledge of occupational hazard and there was a negatively high relationship between knowledge of occupational hazard and age of respondents (r-value = -0.647). On bivariate analysis the study shows a significant relationship between knowledge of hazard control and educational background (X^2 = 286.758, df = 3, p = 0.000). The findings of this study is similar to that of Amabye (2016) which showed that a significant association exist between knowledge of occupational hazards and age (p=0.05). The findings of this study is also similar to that of Amabye (2016) which showed that there was a significant association between knowledge of occupational risks and age (p=0.05). This similarity found in the previous study and the previous one might be due to that fact that age is a strong epidemiological variable which is associated with general health.

Summary

This study investigates the knowledge and practice of occupational hazard control among building construction workers in Port Harcourt metropolis of Rivers State. Nine research questions and six hypotheses were formulated to achieve the aim of the study. The population of the study comprised of all the construction workers in all the building construction sites in Port Harcourt metropolis of Rivers State. A descriptive cross-sectional survey design was adopted as the research design for this study. A multistage sampling procedure was adopted to select a sample of 500 for the study. The instrument for data collection was a self-structured questionnaire with a reliability coefficient of 0.90. Data collected was analyzed using Statistical Package for Social Science (SPSS) version 20. Statistical tools such as

frequency, percentage, Pearson's correlation, binary logistic regression and Chi-square were used for relevant variables.

The findings of the study showed that 70.2% of the respondents had good knowledge of occupational hazard control. The findings of this study on the practice of occupational, hazard control showed that majority (92.2%) of the respondents always keep working material and equipment in good condition and more than three quarter (79.7%) always maintain good housekeeping, more than half (56.8%) use protective materials sometimes, 52.7% rarely use mask while mixing or demolishing and 55.3% always wear foot protection. educational background was found to have a negatively moderate relationship with both knowledge and practice of occupational hazard control. On bivariate analysis the study shows educational background has statistically significant relationship with knowledge of hazard control (X2 133.660, df = 3, P0.000) and practice ($X^{2=}$ 138.534, df' 3, p = 0.000). Age was also found to be statistically significant.

Conclusion

Based on the findings of this study, it was concluded that workers on construction site have good knowledge on practice of occupational hazard control. Factors such as educational status, age, training and years of experience were found to have statistically significant relationship with knowledge and practice of occupational hazards control among building construction workers.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. There is the need for every construction site managers to employ the services of safety professionals to give health talk on occupational hazard control at regular intervals.
2. The ministry of works and labour officials should visit construction sites to ascertain safety measure compliance.
3. Ministry of environment in collaboration with some NGO's should periodically visit the construction site and give seminars on workplace practices.
4. Policy makers and law enforcement agencies should closely monitor and enforce policies and work standard regulations to ensure and improve health among construction workers.
5. Incentives in forms of safety wears, and allowances among other should be given to workers that tare safety conscious every week.

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