KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF BUILDING TECHNOLOGY

THE EFFECTS OF NON- COMPLIANCE TO HEALTH AND SAFETY REGULATION BY BUILDING CONTRACTORS IN GHANA

(CASE STUDY ACCRA METROPOLIS)

MASTER OF SCIENCE IN CONSTRUCTION MANAGEMENT

BY

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DECLARATION

I hereby certify that all material contained within this report is my own work towards the award of MSc Construction Management and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University.

All sentences or passages quoted in this dissertation from other people's work have been specifically acknowledged by clear cross-referencing to the author.

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ABSTRACT

Compliance with Occupational Health and Safety on the construction site is a major factor towards the safety of a worker. Fatalities occur on construction sites despite the various occupational health and safety regulations, rules and laws. In Ghana compliance with occupational health and safety has become a major concern for both the government and the stakeholders. The aim of this research was to sensitize building contractors on the benefits of complying with occupational health and safety regulations in the building construction industry in Ghana. The study set objectives to determine the effects of non-compliance of health and safety issues in the construction in3dustry; to determine the best health and safety practices used in the construction industry; and to determine the challenges in adhering to occupational health and safety standards in building construction sites in Ghana. The research was carried out over three (3) stages. The first stage involved the use of literature review to gather background information for the study. The second stage involved developing questionnaire and the final stage involved the use of statistical package for social sciences (SPSS) to analyze the data. The convenience sampling technique was used in gathering data. Descriptive analysis using percentages and frequencies were conducted. The study revealed that the enforcement of occupational health and safety practices on construction sites by regulatory bodies was very stumpy thereby resulting in several effects due to the high non compliance level of occupational health and safety. It is anticipated that the conclusions made in this study will form the basis for Health and Safety Regulations enforcement by construction companies to ensure the safety of their workforce.

Keywords: Non- Compliance, Occupational Health and Safety, Regulations.

DEDICATION

I dedicate this work to my loving wife, Ruth Sasu Boatemaaa, my Father, Emmanuel Donkor and my daugther, Bevlyn Adu-Boateng for their selfless support and contribution towards my education and my life in general.

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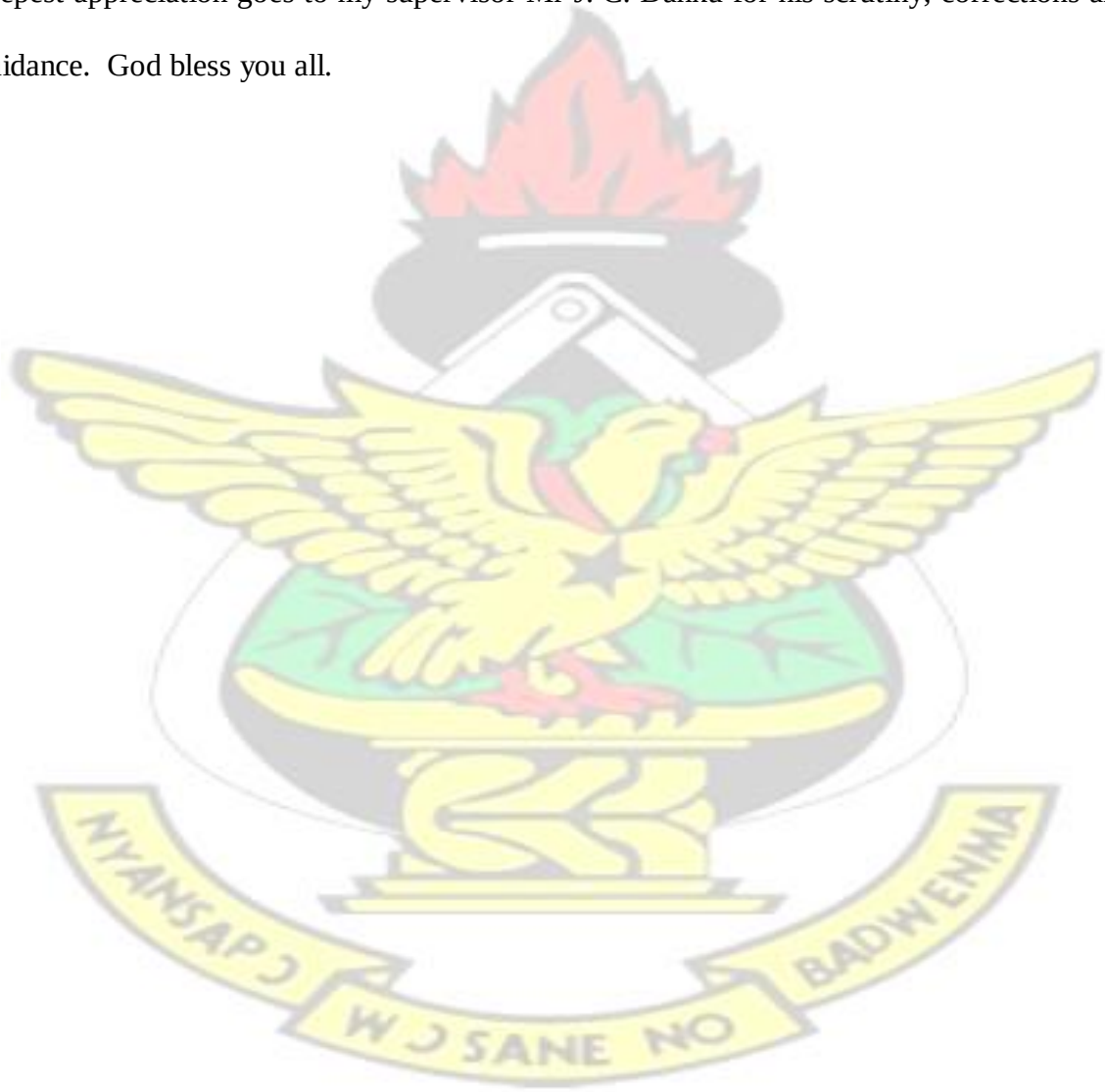

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Health and safety is important as part of employment duties (Hughes and Ferret 2008).

Article 5 Section 24 (1) of the 1992 Constitution of the Republic of Ghana states that "Every person has the right to work under satisfactory, safe and healthy conditions…" The National Building Regulation of 1996 stipulates the need to ensure safety precaution measures at the construction site.

According to Center for Disease Control and Prevention, (2009) Construction workers build our roads, houses, workplaces, repair and maintain our nation's physical infrastructure, these works includes many hazardous tasks and conditions such as work at height, excavations, noise, dust, power tools and equipment, confined spaces and electricity. According to ILO Enclyopaedia of occupational health and hazards in construction industry (2011) Construction projects, especially large ones, are complex and dynamic thus the need for good safety measures.

For success and safety, a team's approach should be developed and implemented on a daily basis through the general contractor or construction manager on the project. In this regard, successful general contractors share a common approach to safety that works-daily meetings with the workforce to remind them of the need for safety. The need for a team's approach to safety and to address particular safety concerns related to the work to be performed on a

specific day, such statements and advice seem so basic, but are rarely executed perfectly on sites thus the occurrence of accidents on site (Kevin and Matthew 2008).

The protection of bodies and minds of people from injuries resulting from site activities is very important for good health (Hughes and Ferret, 2013). Non compliance to occupational health and safety may result to series of accidents on site (Holt, 2005). Work-related injuries and lost workdays cost the construction industry a lot of monies (Stranks, 2006). Also sick days resulting from common office environment also affect not only the worker or trade at issue, but all aspects of the project at hand (Kevin and Matthew, 2008).

Attention to matters of Health and safety is a responsibility of everyone at work but it is of a particular importance in the construction industry where accident rate is quite high (Davies and Tomasin, 2002).

1.2 STATEMENT OF THE PROBLEM

Employees are the most important resources of an organization. An employer has legal responsibilities to ensure the health and safety of its employees and others on the work site. A safe and healthy workplace has low risks of injuries or damage to property and low incidents of illness, injury and disability in its workforce. Non – compliance of occupational health and safety regulations have a lot of effects on construction works and the country as a whole. These effects include injury to workers, death as well as increase in cost of the contractor's expenditure or overheads. When it affects a skilled person it may delay work unnecessarily

thus extension of completion period which may attract liquidated and ascertained damages if applicable to the project as well as having negative impact on the company's reputation.

1.3 AIM OF THE STUDY

The aim of the research is to sensitize building contractors on the benefits of complying with occupational health and safety regulations in the building construction industry in Ghana.

1.4 OBJECTIVES OF THE STUDY

To accomplish this aim, a number of objectives were set.

The objectives of the research are to:

1. Determine the effects of non-compliance of health and safety issues in the building construction in Ghana.
2. Determine the challenges in adhering to occupational health and safety standards in building construction sites in Ghana.
3. Determine the best health and safety practices used in the construction industry.

1.5 SCOPE AND LIMITATION OF THE STUDY

It is the researcher's intention to widen his scope of study by interviewing building construction professionals to establish beyond doubt the effects of non-compliance of occupational health and safety regulation at construction site. However due to lack of ample

time and financial constraints, the researcher is restricted to Accra Metropolis for his investigations.

1.6 RESEARCH METHODOLOGY

This deals with the research design, the population sample, sample procedure, the instrument employed, method of data collection administration of questionnaire, method of data analysis and constraints and limitations. The researcher used both secondary and primary sources of data to gather information. People in the construction sector were contacted for information. In no particular order, workers on site were interviewed from different construction sites.

1.7 RESEARCH QUESTIONS

- Does non-compliance of Occupational Health and Safety regulation has any negative impact in the construction industry?
- Does non-compliance of environmental health and safety regulation has any impact on productivity?
- Are the regulatory bodies doing their work as expected?
- Are workers aware of the risk they face at their various sites as a result of noncompliance?

These questions would guide the researcher in conducting the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Developing an Effective Safety Culture implements a simple philosophy, namely that working safely is a cultural issue. An effective safety culture will definitely lead to the desired goal of zero incidents in the work place (Rougthen, 2002).

While worker safety is often touted as a company's first priority, more often than not, safety activity is driven by compliance to legislation rather than any safety improvement initiative (Hefey, 2009). Safety and health at work should be every staff on site responsibility (Geller, 2002).

This chapter talks comprehensively about various literatures from different authors which the researcher used as a research tool. It reveals books on the effects of non compliance, it talks about the state of the construction industry in Ghana, duties of health and safety officer, types of accidents and causes etc.

2.1.2 Definitions

Construction Industry; It includes all organized activities concerned with construction, including, demolition, buildings, landscaping, maintenance, civil engineering works, process engineering work, heavy engineering works and mining.

Contractor; organisation that contracts with a client to carry out construction and related services.

Health : The protection of the bodies and minds of people from illness resulting from the materials processes or procedures used in the workplace.

Safety; The protection of people from physical injury.

Welfare: The provision of facilities to maintain the health and wellbeing of individuals at the workplace.

Occupational or work related ill health: This is concerned with those illness or physical and mental disorders that are either caused or trigged by work place acts.

Environmental Protection: Theses are arrangements to cover those activities in the workplace which affect the environment in the form of water, air, soil and possibly the health and safety employees and others, such activities include waste and effluent disposal and atmospheric pollution.

Accident: An accident or a mishap is an unforeseen and unplanned event or circumstance, often with lack of intention or necessity. It usually implies a generally negative outcome which might have been avoided or prevented had circumstances leading up to the accident been recognized and acted upon, prior to its occurrence. Injury prevention refers to activities designed to foresee and avoid accidents.

Project; An undertaken with a defined beginning and objective by which completion is defined. A project may be completed using one contract or a number of contracts.

2.2 LEVEL OF NON COMPLIANCE

The level of non compliance of health and safety regulations can be attributed to worker and management attitude among other factors towards the works at hand (Haupt and Smallwood, 1999).

According to the Department of Enterprise, Trade and Employment (2011) many factors contribute to fatal incidents at site of which can be attributed to lack of appropriate employee training and failure to provide and enforce the use of safety equipment. However Laney (1994) as cited by Othman (2012) argues that non compliance can be attributed to managerial ignorance on construction sites.

As indicated by Bureau of labour statistics (2013) A preliminary total of 4,383 fatal construction work injuries were recorded in the United States in 2012, The UK constructions news (2006) indicates that several thousands of dollars are paid by construction companies to victims of accidents on sites due lack of compliance to health and safety regulations. Haggins (2009) explains that time overruns on projects can also be attributed non compliance, likewise increased budgeted cost (Sidumedi, 2009).

2.3 EFFECTS OF NON COMPLIANCE OF OCCUPATIONAL HEALTH AND SAFETY

According to Hughes & Ferrett (2005) the construction industry is a very accident-prone industry. Odeyinka et al (2005) believe that construction workers are more likely to be killed than any other workers, as explained by Maloney (2012) non compliance of occupational health and safety have several effects which include accidents such as falling from heights, cutting off of limbs due to mishandling of heavy equipment, objects falling from heights.

Construction works suffer a lot from accidents depending on the severity of the injury however some workers may require light or restricted duties. Others are forced to miss multiple days of work to recover, resulting in lost wages (Ransasky,2013) Aside the accidents Haggins (2009) makes it clear that non compliance will definitely lead to high cost of construction works emanating from payment of compensations to the affected victims. In all, the following can be described as the various effects due to non compliance of occupational health and safety.

1. Common accidents as a result of non compliance.
2. Increased budgeted cost of construction works.
3. Elapsed time.

2.3.1 COMMON ACCIDENTS AS A RESULT OF NON COMPLIANCE

In the construction industry, owners, contractors and designers have the obligation to provide a safe site working environment, and their negligence on safety may cause severe accidents and injuries (Laufer, 1987). According to Disparti Law group (2012) Non compliance with occupational health and safety causes a lot of accidents thus resulting in serious injuries and death, Sa (2011) classifies accidents into the following categories namely falling hazards, electrical, caught in and struck by hazards on the other hand. Bernard, (2009) argues that construction accidents can be classified into falling hazards, collapsed excavation walls and

trench hazard which is similar to caught in by power tools or electrical and vehicle accidents. (Sa, 2011).

2.3.1.1 Falling Hazards

According to United States of America labour Department (2009) falls can be grouped into five (5) main types namely; falls from scaffolds, building structures, exterior construction areas, stairs and ladders. Fall is described by (Bernard, 2009) as a common injury that occurs when a worker near an open-sided floor focusing on his work, steps backwards or to the side without looking and ends up falling.

2.3.1.2 Collapsed Excavation Walls and Trenches

Eschenasy (2008) describes trench collapses as the situation where a trench cave-ins and side wall collapses on workers.

2.3.1.3 Electrical Accidents

These accidents are frequently caused by not using appropriate eye and ear protection. Nail gun injuries have increased each year making eye injuries quite common (Bernard 2009). Also as indicated by Maloney (2008) Live wires and dangling electrical wires can cause electrocution that can easily kill workers. According to Philips national injury group (2010) Electric shock occurs when the body comes into contact with electric current.

2.3.1.4 Vehicle accidents

Large construction equipment example cranes, forklifts, dump trucks, road graders and concrete mixtures, etc, may become potential dangers on a construction site due to their weight and size, workers and drivers can be seriously injured or killed in an accident (Laufer,1987). In some cases, drivers may not have competent driving skills, or their visibility may be limited due to site constraints (Laufer, 1987).

2.3.2 Causes of accidents on construction sites due noncompliance of health and safety

Workers are deemed to be the cause of site accidents due to their fatigue, lack of discipline, carelessness and distractions, alternatively, some accidents are attributed to senior management because of its ignorance, lack of training and poor communication (Laney, 1982). Martin (2010) believes that accidents are part and parcel of the construction industry and that the incidence of accident cannot be eradicated totally but can be reduced if healthy and safe practices are employed. Some causes of accidents on construction sites are elaborated by Abdul et al (2008) and stated the following as the dominating causes of accidents in the construction industry.

(1) Workers' negligence.

(1) Failure to obey work procedures as well as incorrect work procedures.

(2) Nature of work being performed (work at heights).

(3) Equipment without safety devices.

(4) Poor site management.

(5) Lack of workers' knowledge and skills.

(6) Negative attitude of workers.

(7) Failure to use protective gadgets

Also as indicated by Keller (2011) some of the causes of accidents include over exertion which refers to situations where workers often have to work in extreme conditions doing hard labor for many hours which may lead to heart attacks, repetitive movement injuries, and other health issues.

According to Abdelhamid and Everett (2000) an unsafe condition is another factor which can cause accidents on sites. Caldwell (2000) explains that lack of warning signs on dangerous spots can cause very serious accidents on construction sites.

2.3.2 Elapsed Time

Tipton (2010) explains that additional time is always needed to complete works whenever accidents occur on site, thus the need for additional time to complete suspended works due to accident.

2.3.4 Increased cost in construction

According to Wilhelm (2012) construction companies are made to pay large fines upon violation of health and safety standards in United Kingdom which clearly depicts the loses borne by contractors for non compliance of health and safety regulations. According to PP construction ltd (2014) the UK government through the courts fined contractors and made them to pay over £5,000 in 346 cases in 2013. Also explained by PP construction ltd (2014)

the United Kingdom government published a report on health and safety Act 2008: Postlegislative scrutiny memorandum 16 January 2014 of which the purpose was to increase the maximum penalties for workplace health and safety offences that could be heard in both the lower and higher courts. It was believed that if the penalties were increased it would provide a greater deterrent to would-be offenders.

2.4 ELEMENTS OF AN EFFECTIVE SAFETY PROGRAMME

2.4.1 Role of the safety officer

A safety officer monitors workplace activities to ensure that workers comply with company policies and government safety regulations. The duties of this job vary from employer to employer, but safety officers typically have responsibilities pertaining to policy development, safety inspections and safety training (Leigh, 2010). As described by Pleasant (2010) Construction safety officer (CSO) is responsible for making sure that people working in the construction industry adhere to certain rules and regulations regarding safety.

2.4.2 Safety Policies

According to Bianca (2011) Developing safety policies and procedures is an important part of reducing the risk of injuries and deaths in the workplace. Organizations use different models for developing a comprehensive manual of safety policies and procedures. Creating a joint

workplace safety and health committee is one way to ensure that employees from all departments work together to develop a comprehensive safety program (Bianca, 2011)

2.4.3 Workplace Inspections

According to Construction, Health and safety management group (2010). Construction safety inspections are the most effective means of identifying hazardous conditions at the worksite, as explained by Leigh (2010) Safety officers inspect interior and exterior work areas to determine if there are any safety hazards and during these inspections, a safety officer looks for damaged equipment, slip-and-fall hazards areas and other potential hazards which are likely to occur.

As explained by McCollum (1995) Regular inspections are carried out to identify existing or potential hazards so that appropriate corrective action can be taken. It is expected that supervisors and workers report and take action on hazards as they are encountered. Taylor et al (2004) indicated that past records of accidents and the potential for serious accidents and injuries are factors to be considered in determining if more frequent inspections are needed and also critical areas should receive extra attention.

According to Bureau of Labor Statistics, U.S. Department of Labor (2014).Other criteria for selecting those who will inspect are:

1. knowledge of regulations and procedures.
2. knowledge of potential hazards.
3. Experience with processes involved.
4. Adequate training in inspection**.**

Workplace inspection is good and should be planned comprehensively by those who design and oversee large and small projects (Wiley, 1995)

Table 2.1 Site health and safety inspection form.

LOCATION: CONTRACT No: DATE:

No	ISSUE	Y	N	N/A
1.	**SAFE PLACES OF WORK**			
1.1	Can everyone on the project reach their place of work safely, e.g. are roads, gangways, passageways, passenger hoists, staircases, ladders and scaffolds in good condition?			
1.2	Are there guard rails or equivalent protection to stop falls from open edges on scaffolds, mobile elevating work platforms, buildings, gangways, excavations, etc?			
1.3	Are all holes and openings securely guard railed, provided with an equivalent standard of edge protection or provided with fixed, clearly marked covers to prevent falls?			
1.4	Are the working structures stable, adequately braced and not overloaded?			
1.5	Are all working areas and walkways level and free from trip hazards and obstructions such as stored material and waste?			
1.6	Is our site tidy, and are materials stored safely?			
1.7	Are proper arrangements in place for collecting and disposing of waste materials?			
1.8	Is the areas free from trailing cables and other slip/trip hazards. Eg. spillages, waste etc.			
1.9	Is the work area and interior adequately lit? Have we sufficient additional lighting provided when work is carried on after dark or inside buildings?			
2.	**SCAFFOLDING**			
2.1	Are all of our scaffolds and work platforms erected, altered and dismantled by competent persons?			
2.2	Do we have hand-over certificates for all our scaffolds?			
2.3	Is there a safe access method (ladder) to the scaffold platform?			
2.4	Have all uprights been provided with base plates (and, where necessary, timber sole plates) or prevented in some other way from slipping or sinking?			

As explained by Tailored fire & security ltd (2013) it is always best to carryout inspection using a format like the table above to serve as a form of checklist.

2.4.4 Accident Investigations

An accident investigation is an important component of occupational health and safety programs, and an essential part of building a successful workplace safety culture. The investigation should be conducted by someone who is familiar with the workplace, as well as having someone who has been trained in the accident investigation process (Rick, 2010).

According to Leigh (2010) when a workplace accident occurs, a safety officer conducts an investigation to determine why the accident happened. The officer may question witnesses, inspect the accident scene and take pictures of any property damage, once the officer determines the cause of the accident, he writes a report detailing the cause and provides recommendations that can help prevent future accidents.

2.4.5 Training and Coaching

Health and safety training for construction workers is essential to their safety on a job site. Contractors are responsible for providing workers with the education and training needed for the health and safety of the workforce (Wendy, 2014).

Employee education aims to develop knowledge and understanding, rather than knowledge and skill, for a defined activity through various methods which provide an understanding of traditions, ideas and concepts, it involves verbal as well as other communication channels which are fundamental to learning. Education on matters such as safety, hazard management, and emergency procedures is vital to safety management (Wendy, 2014). Training on the other

hand, is the planned and systematic sequence of instruction, under competent supervision, designed to develop or improve the predetermined skills, knowledge and abilities required by an individual to perform a task to a particular situation McCollum (1995). Taylor et al (2004) found out that if general health and safety policies are to be incorporated into specific job practices and skill levels are to be raised to an acceptable standard, training is required.

2.4.6 Regulatory Compliance

Employers must comply with regulations published by state occupational safety agencies. This involves reviewing standards, implementing plans to meet those standards and following all record-keeping requirements. (Terry and Galloway, 2013).

2.4.7 Periodic safety performance review

Managers use performance reviews as a way to monitor employee behaviors, productivity and professionalism, there should be also a time for employees and employers to discuss workplace issues, such as safety and by discussing safety initiatives, managers can ensure that their staff are getting the information they need to remain safe in the workplace (Sheahan, 2012).

According to Terry and Galloway (2013) Periodic safety performance review is good because it helps to

1. Create a culture of excellence that is reinforced and empowered at every level

2. Develop the capability within the culture to identify, prioritize, and solve safety problems and challenges.
3. Maintain and continuously improve the performance of your organization's safety culture.

2.4.8 Site Management Safety Training

According to Surendran (2010) Construction is a big industry all over the world and this is the reason why it is recommended to pursue it as a career, a lot of people have been working in this industry and gaining popularity as professionals, there are approximately 2.2 millions of people who have been making their living in construction industry. Two of the most important factors include Site Management Safety training and construction safety, there are various courses offered in this field and people who want to make career in this sector must pursue these courses, these courses are designed for targeting the career as a site manager, construction project manager and directors.

2.4.9 Safety management plan

According to Walter (2011) a construction safety management plan is a must for any contractor or real estate developer actively doing business and taking on construction projects. In fact, most cities and municipalities would almost always require a company engaged in the construction business to present such a plan, before any clearances or government permits are issued for the lawful commencement of construction or operations.

As explained by Hughes & Ferrett (2005) Undertaking a policy and plan on construction safety is actually easier than it sounds, business owners are daunted by the task, but it is well worth the initial effort to prepare rather than to deal with the consequences of accidents and mishaps later on.

2.4.10 Site responsibility on health and safety

According to European Agency for Safety and Health (2006) everyone on site, whether employer or employee, has responsibilities for health and safety, only the level of responsibility varies. The extent of the responsibility should be written into the Occupational health safety (OHS) plan so that all persons know what is expected of them. Principal contractors have a responsibility to provide a safe and healthy workplace, as well as responsibility towards their sub contractors (Geller, 2000). Everyone on site, whether employer or employee, has responsibilities for health and safety, only the level of responsibility varies, example principal contractors have a responsibility to provide a safe and healthy workplace, as well as responsibility towards their sub contractors (Agnew and Snyder, 2008).

2.4.11 Methods used to promote and ensure compliance

Although it cannot be quantified, it can be inferred that the construction regulations have had a positive impact on reducing occupational health and safety accidents (Smallwood et al., 2009).

2.4.12 Safe working procedure

This is to make sure all people working at heights are equipped and knowledgeable about their safety harness and the correct way of wearing their protective gear Geller (2000). The safety officers have to ensure that all participants are guarded against the ever present dangers on construction sites Geller (2000).

2.4.13 Provision of welfare facilities on site

According to Ridley et al, (1999) generally a common practice that most contractors provide adequate welfare facilities for construction workers as soon as possible, before work starts. Under the Construction health, Safety and welfare Regulations (1996) every contractor or employer has a duty to provide, or ensure that, certain health and welfare facilities such as Toilets, canteen, Baths etc are to be made available on site.

2.4.14 Codes of Practice for best health and safety practices in Ghana

2.4.14.1 Labour Act of Ghana, 2003 (Act 651, part XV, p.43-44) on Occupational Health and Safety and Environment

(A) General Health and Safety Condition. (Section 118). It states as follows;

(1) It is the duty of an employer to ensure that every worker employed by him or her works under, safe and healthy condition.

(2) Without limiting the scope of subsection (1) an employer shall:

a) Provide and maintain at the workplace, plant and system of work that are safe and without risk to health.

b) Ensure the safety and absence of risks to health in connection with use, handling, storage and transport of articles and substances.

c) Provide the necessary information, training and supervision having regard to the age, literacy level and other circumstances of the worker to ensure so far as is reasonably practicable, the health and safety at work of those other workers engaged on the particular work.

d) Take steps to prevent contamination of the workplace by, and protect the workers from toxic gases, noxious substances, vapours, dust, fumes, mist and other substances or materials likely to cause risk to safety or health.

e) Supply and maintain at no cost to the worker adequate safety appliances, suitable fire- fighting equipment, personal protective equipment and instruct the workers in the use of the appliances or equipment.

f) Provide separate, sufficient and suitable toilet and washing facilities and adequate for storage, changing, drying and cleansing from contamination of clothing for male and female workers.

g) Provide adequate supply of clean drinking water at the workplace.

h) Prevent accident and injury to health arising out of connected with or occurring in the course of work by minimizing the causes of hazards inherent in the working environment.

(3) It is the obligation of every worker to use the safety appliances, fire – fighting equipment and personal protective equipment provided by the employer in compliance with the employer's instructions.

(4) An employer shall not be liable for injury suffered by a worker who contravenes subsection (3) where the injury is caused solely by non-compliance by the worker.

(5) An employer who, without reasonable excuse ,fails to discharge any of the obligations under subsection (1) or (2) commits an offence and is liable on summary conviction to a fine not exceeding 1000 penalty units or to imprisonment for a term not exceeding 3 years or to both.

(B) Section 119 Exposure to imminent hazards

(1) When a worker finds himself or herself in any situation at the workplace which she or he has reasonable cause to believe presents an imminent and serious danger to his or her life, safety or health, the worker shall immediately report this fact to his or her immediate supervisor and remove himself or herself from the situation.

(2) An employer shall not dismiss or terminate the employment of a

Worker who has removed himself or herself from a present imminent and serious danger to his or her life, safety or health.

(3) An employer shall not require a worker to return to work in circumstances where there is a continuing imminent and +serious danger to the life, safety or health of the worker.

(C) Section 120 Employer to report occupational accidents and diseases

An employer is required to report as soon as practicable and not later than seven days from the date of the occurrence to the appropriate government agency occupational accidents and diseases which occur in the workplace.

2.4.14.1 Labour Regulation, 2007 (L.I. 1833) section 18.

(A) Occupational Safety and Health at Work

(1) An employer shall take appropriate measures to safeguard the health and safety of employees.

(2) An employer of business premises where;

(a) an occupational accident or disease occurs

(b) an employee dies or is incapacitated from work as a result of an accident or disease shall report to the Chief Labour Officer or the Inspector of Factories if the accident or disease occurs during or in the course of the employment of the employee.

(3) An employer shall ensure that the business environment is not rendered unsafe by the business operations.

2.4.14.2 Factory, Offices and Shops Act, 1970 (Act 328)

The factories, offices and shops Act, 1970 (Act328) has the following provisions;

(a) Every factory office and shop shall be provided with adequate means of escape in case of fire for the persons employed there as may be reasonably required

(b) Where any person has to work at a place from which he will be liable to fall a distance more than eight feet, means shall be provided, so far as is reasonable to ensure his safety.

(c) All floors, steps, stairs, passages, gangways shall be of strong construction and properly maintained and shall so far as is reasonably practicable be kept free from any obstruction and from any substance likely to course any person to slip.

(d) For every staircase in a building or affording a means of exit from building, a substantial handrail shall be provided and maintained.

Any employee injured as a result of a breach by the employer of any of the above provisions is entitled to recover damages for breach of statutory duty.

2.4.14.3 Workman's Compensation Act 1963 (Act 174) now PNDC Law 187, 1987.

Another statute which has made the rights of employees against their employers under common law less significant is the workman's compensation Act, 1963 (Act 174). Now PNDC Law 187, 1987. The principle of compulsory payment of compensation by the

employer in respect of the death or disablement of a workman as a result of accident occurring in the course of his employment, independent of negligence is not provided for by this Act.

2.5 CHALLENGES IN ADHERING TO OCCUPATIONAL HEALTH AND SAFETY STANDARDS IN BUILDING CONSTRUCTION SITES IN GHANA

2.5.1 Cost of compliance

Compliance with H&S regulations, according to Smallwood (2004) is an enabler and catalyst for enhanced performance relative to cost. Contractors are more willing to spend money on compliance where the financial costs of non-compliance (i.e. cost of accidents) are likely to be high. According to Windapo (2011), it is not surprising that contractors perceive regulations as an additional burden, which they have to conform with and which gives rise to unnecessary costs as Geller (2000) views compliance with the occupational health and safety regulations as costly. In an attempt to avoid these perceived additional costs, contractors tend not to comply fully with health and safety regulations. Smallwood (2004) estimated that the cost of implementing H&S systems within a company is between
0.5% and 3% of total project costs. Baxendale & Owain (2000) established that the costs of implementation of health and safety on small construction sites are higher than that of larger projects.

2.5.2 Knowledge and Training

Haupt and Smallwood (1999) noted that lack of training is a major cause of non-compliance by workers with health and safety legislation on construction sites. Workers that are not trained would not be knowledgeable or aware, and are consequently unable to properly comply with requirements (Smallwood, 2002); and will underestimate the inherent risks or hazards in their work (Haupt and Smallwood, 1999; McLeod, 2007). While Smallwood (2002) noted the widespread lack of understanding by workers when it comes to regulations and the requirements thereof, Haupt and Smallwood (1999) established that very few workers are actually aware of the requirements of occupational health and safety. Smallwood (2002) is of the view that managers are unlikely to be committed to health and safety legislation if their level of knowledge and awareness of H&S regulatory requirement is limited.

2.5.3 Compliance with health & safety regulations

Perception is the way information is picked up to influence behaviour (Bridgeman and Hoover, 2008), and it is unique to individuals (McDonald, 2012). Thus, different people will have different perceptions of a given situation. Mcleod (2007) notes that there are a number of factors that influence the perceptual set and thus influence perception, and those factors are made up of expectations, emotion, motivation and perceptions (Mcleod, 2007). A general underlying belief is that the majority of accidents are not caused by the carelessness of workers, but by failures in control, which is ultimately the responsibility of construction site management (Baxendale and Owain 2000).

2.6 SUMMARY

According to this literature review health and safety regulations in the construction industry were enacted to safeguard lives and to improve the quality of construction products, including construction processes (Smallwood, 2002). However, contractors have been reported to be non-compliant with these regulations Geller (2000). This literature review revealed the levels of compliance by construction firms with the occupational health and safety regulatory requirements, the reasons for compliance and non-compliance, and how these affect the cost and performance of construction projects. The main reasons for noncompliance with health and safety regulations are the lack of knowledge and understanding of health and safety legislation requirements by lower management, sub-contractors and all site operatives (Baxendale and Owain, 2000).

According to (Haupt and Smallwood, 1999; McLeod, 2007) Other significant reasons for non-compliance are the profit maximization motive driven by the competitive nature of the construction industry, as well as negligent attitude of the contractor. It emerged from the literature review that contractors benefit from a safe work environment, reduction in cost of accidents and improved productivity with increased level of compliance with occupational health and safety requirements. This suggests that, although complying with the occupational health and safety regulations involves upfront costs, the costs saved in the long run in preventing potential accidents outweigh the cost of compliance.

CHAPTER THREE

RESEARCH METHOD

3.1 INTRODUCTION

This chapter describes the research design, the population, the sample and sampling procedure. It also describes the research instruments, the procedure for data collection and methods that are used for the data analysis.

3.1 Research Design

The researcher employed a descriptive survey method. According to Leedy (2002), descriptive survey involves the collection of data in order to answer questions concerning the current status of the problem. The major techniques or tools used in collecting data in this type of research are the questionnaire, interview and observation. Since this study intends to explore the innovative strategies to prevent effects of delayed payment in the construction industry, the descriptive survey study is found most appropriate.

3.2 Research approach

Factors and information relevant to the study under consideration were evaluated by using questionnaires and interviewers to their relevance within the scope defined by the research.

Questionnaires were developed to cover the objective of the study. Contractors with various classes, were used as the population size. The Greater Accra Association of building contractors region has a total of 59 registered contractors with of various financial classes and 6 consultants.

3.3 Target Population

The target population of the study included construction companies in the Greater Accra Region. The population of the study consists of contractors who have registered with the office of the Greater Accra region Contractors Association located in Accra.

3.4 Sample size determination*:*

In order to obtain the sample size for the survey, a statistical method was used with respect to the total population of contractors with all classes and Consultants in the Greater Accra region.

3.4.1 Sample size

In the sampling a confidence level of 95% and an absolute limit of 5% are usually used.

Thus the size of sample was determined using the following formula (Kish,1965)

$$N = \frac{K}{1+\frac{K}{N}}$$

n= sample size

$$K = \frac{S^2}{V^2}$$

N=Total population

V=Standard error of sampling assumed to be 0.05

S=Maximum standard deviation population elements (total error =0.1 at a confidence level of 95%)

$S^2 = P(1-P)$

P= the proportion of population element that belong to the defined class.

Contractors=59

Consultants= 6

Therefore total population =65

$S^2=0.5(1-0.5)$

=0.25

$N^1 = 0.25/0.05^2 = 100$

$$n = \frac{100}{(1+\frac{100}{65})}$$

n=40

It was assumed that distribution of the questionnaires will be fast since contractors with all financial class and Consultants working in the same Region were to be selected, as a result, the response rate would be high. The response rate was assumed to be 85%.

3.5 Sample and Sampling Procedure

A sample size of 40 respondents was selected for the study. Then, a convenience sampling technique was used to select 35 respondents from contractors and 5 consultants in the Greater Accra region. Convenience sampling method was adopted because the respondents were selected based on their convenient accessibility and proximity to the researcher. More so, convenience sampling is fast and inexpensive in recruiting the contractors, clients and consultants for the study (Creswell 2009).

3.6 Research Instrument

The research instrument used for the study was a questionnaire made up of questions. The questionnaire was developed from the literature review based on research questions proposed for the study and covered issues of exploration into innovative strategies to prevent the effect of delayed payment. Further, the questionnaire included open-ended and closed – ended items for contractors and the consultants, but unstructured questionnaire for experts.

3.7 Data Collection Procedure

An introductory letter was obtained from the head of graduate school of graduate studies, Kwame Nkrumah University of Science and Technology enabled me to have a good rappor with the contractors and consultants in the Greater Accra Region. The purpose of the study was explained to the respondents and this paved the way for the researcher to retrieve most of the questionnaires from the respondent without difficulty. The instructions for completing the questionnaire explicitly appeared on the instrument; therefore no further instructions were needed when distributing the questionnaire. The researcher also availed himself to the respondents to answer questions that bordered on the study. It took the researcher three weeks to collect the data from the respondents.

3.8 Data Analysis

The responses to the item on the questionnaires were analyzed using frequencies and percentages, with the use of Statistical Package for Social Science (SPSS) Version 18.0. To ensure consistency, the responses in the questionnaires were edited and coded. The responses

for the open-ended questions were grouped based on common ideas that the respondents expressed. The results were presented using frequencies and percentages.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSIONS

4.1 INTRODUCTION

This study investigated the effects of non- compliance of health and safety regulation by building contractors in Ghana with specific reference to the Accra Metropolis.

In finding out this, the following objectives were outlined to guide the study. In the first place, the study sought to determine the effects of non-compliance of health and safety issues in the building construction industry in Ghana. Secondly, the study determined the best health and safety practices used in the construction industry.

Finally, the study sought to determine the challenges in adhering to occupational health and safety standards in building construction sites in Ghana.

In this chapter, the results of the data analysis are presented and interpreted in line with the research objectives and the research questions. The data is presented in tables beginning with the sample characteristics and then research questions that were formulated to guide the research. The first part of the chapter considers the background of the respondents, focusing on class of company, numbers of years spent in the construction industry and academic qualification. The second part presents the findings from the study effects and causes of non compliance with occupational health and safety while the third section focuses on the best practices used to ensure compliance of health and safety in the construction industry. The last

part throws more light on the challenges in adhering with occupational health and safety in the construction industry.

4.2 BACKGROUND OF RESPONDENT

Section (1) of this chapter focuses on the background of respondents, it throws more light on respondents' class of company, and number of years worked in the construction industry and academic qualification.

Table 4.1 class of company

Response	Frequency	Percent
D1, K1	9	22.5
D2, K2	11	27.5
D3, K3	20	50
Total	**40**	**100**

With regards to participation of construction firms, about 50% of the construction firms belong to D3K3 classification of Ministry of Water Resources, Works and Housing, 27.5 belonged to the D2, K2 classification whereas 22.5% belonged to the D1, K1 classification. Table 4.1 above suggests that majority of the respondents were from construction firms under D3, K3 classification

Table 4.2 Years in the Construction industry

Response	Frequency	Percent
Less than 2 years	8	20
2 – 6 years	12	30
Over 6years	20	50
Total	**40**	**100**

The analysis further revealed that the respondents had varying number of working experiences in the construction industry. Table 4.2 above shows that majority of the participants had been in the construction industry for periods over 6 years.

Specifically, 30% of the respondents indicated they had been working as contractors in the Accra metropolis between 2-6 years, while 20% mentioned that they had been for less than 2 years.

Table 4.3 academic qualification

Response	Frequency	Percent
Graduate Level	17	42.5
Diploma Level	10	25
Secondary Level	5	12.5
Technician Level	7	17.5
Total	**40**	**100**

Further, the researcher was interested in the various educational levels of respondents. The results showed 42.5% of the respondents representing the majority of participants were Graduates. This was followed by individuals with Diploma certificates who constitute 25% of the respondents ,however, 7 respondents representing 17.5% were at the Technician level while12.5% were secondary school leavers.

It could be deduced from table 4.3 above that majority of the respondents were individuals with good educational background.

4.3 EFFECTS AND CAUSES OF NON COMPLIANCE WITH OCCUPATIONAL HEALTH AND SAFETY

Section two (2) of this chapter throws more light on the effects and causes of noncompliance with occupational health and safety in the construction industry. It provides data on the above mentioned subject.

Table 4.4 Frequency of effects occurring

Effects on non- compliance	Very low frequency No. (%)	Low frequency No. (%)	Neutral No. (%)	High frequency No. (%)	Very high frequency No. (%)	Total No. (%)
Injury due falls	4(10)	6(15)	5(12.5)	21(52.5)	4(10)	40(100)
Injury due electric shocks	6(15)	0(0.00)	0(0.00)	30(75)	4(10)	40(100)
Injury due to vehicular movement	30(75)	10(25)	0(0.00)	0(0.00)	0(0.00)	40(100)
Death	15(37.5)	20(50)	5(12.5)	0(0.0)	0(0.0)	40(100)
Delays in work execution due to injury of worker	2(5.0)	3(7.5)	10(25)	10(25)	15(37.5)	40(100)
Extra cost due to payment of compensation to injured victims	4(10)	5(12.5)	1(2.5)	15(37.5)	15(37.5)	40(100)

The table above represents the effects of non- compliance with occupational health and safety in the construction industry in the Accra Metropolis. Respondents in the construction industry were asked to indicate how frequently they experienced the listed effects.

From the Table 4.4 10% of the respondents indicated injury due falls was experienced on a very low frequency, while 15% said it was experienced on a low frequency, however,12.5%

respondents were neutral whereas 37.5% indicated it occurred on a high frequency, also majority of the respondents representing 25% said it occurred on a very high frequency. With injury due electrical works 75% of workers confirmed it's rapid occurrence whilst 10% admitted that it occurs at a higher rate. Most workers admitted that injury due to vehicles occurs on a very low frequency.

On the issue of death, 37.5% of the respondents indicated it occurred on a very low frequency, while 50% said it occurred on a low frequency, however, 12.5% respondents were neutral whereas none indicated it occurred on a high frequency and very high frequency respectively.

On the issue of delay in work execution due to injury of worker, 37.5% representing majority of the respondents indicated the experienced it on a very low frequency, while 7.5% said it occurred on a low frequency, however, 25% respondents were neutral whereas 25% indicated it occurred on a high frequency, 5% said it occurred on a very high frequency. Responses given by respondents on extra cost due to payment of compensation to injured victims were as follows 10% of the respondents indicated it occurred on a very low frequency, while 12.5% said it occurred on a low frequency, however, 2.5% respondents were neutral whereas 37.5% indicated it occurred on a high frequency and very high frequency respectively.

The analysis from table 4.4 reveals that with the exception of death which occurred on a low frequency, the other factors were experienced on a high frequency in the various construction firms that responded to the questionnaires this attest to the assumption that the above listed factors are indeed effects of non compliance to occupational health and safety regulations.

Table 4.5 level of contribution factors to non compliance of occupational health and safety on construction sites.

Factor	Very low frequency No. (%)	Low frequency No. (%)	Neutral No. (%)	High frequency No. (%)	Very High frequency No. (%)	Total No. (%)
Workers negligence	2(5.0)	3(7.5)	5(12.5)	13(32.5)	17(42.5)	40(100)
Poor site management	0(0.0)	2(5.0)	8(20.0)	20(50.0)	10(25.0)	40(100)
Lack of workers' knowledge	8(20.0)	7(17.5)	6(15.0)	10(25.0)	9(22.5)	40(100)
Working without safety gadgets	2(5.0)	3(7.5)	10(25)	10(25)	15(37.5)	40(100)
Failure to use their PPE	0(0.0)	6(15.0)	0(0.0)	9(22.5)	25(62.5)	40(100)
Equipment without safety devices	0(0.0)	0(0.0)	7(17.5)	13(32.5)	20(50.0)	40(100)
Incorrect work procedure	2(5.0)	4(10.0)	6(15.0)	12(30.0)	18(45.0)	40(100)

The table 4.5 above represents the causes of non- compliance with occupational health and safety in the construction industry in the Accra Metropolis. Respondents in the construction industry were asked to indicate on a like art scale how frequently they experienced the above listed causes.

From the table above, 5% of the respondents indicated that workers negligence occurred on a very low frequency, while 7.5% said it occurred on a low frequency, however,12.5%

respondents were neutral whereas 32% indicated it occurred on a high frequency, also majority of the respondents representing 42.5% said it occurred on a very high frequency.

None of the respondents indicated poor site management occurred on a very low frequency, but 5% said it occurred on a low frequency, however,50% respondents representing the majority, were neutral whereas 25% indicated it occurred on a high frequency, also 25% said it occurred on a very high frequency.

20% respondents indicated lack of knowledge on the part of workers occurred on a very low frequency, while 17.5% said it occurred on a low frequency, however,15% respondents were neutral whereas 10% indicated it occurred on a high frequency, also 22.5% representing the majority said it occurred on a very high frequency.

5% of the respondents indicated working without safety gadgets occurred on a very low frequency, while 7.5% said it occurred on a low frequency, however, 25% respondents were neutral whereas another 10% indicated it occurred on a high frequency, also 22.5% said it occurred on a very high frequency.

None of the respondents indicated failure to use PPE occurred on a very low frequency, 15% said it occurred on a low frequency, however, none of respondents were neutral whereas 22.5% indicated it occurred on a high frequency, also 62.5% said it occurred on a very high frequency.

None of the respondents indicated the use of equipment without safety devices on the part of workers occurred on a very low frequency and low frequency respectively, however, 17.5%

respondents were neutral whereas 32.5% indicated it occurred on a high frequency, also 50% said it occurred on a very high frequency.

20% of the respondents indicated lack of knowledge the part of workers occurred on a very low frequency, while 17.5% said it occurred on a low frequency, however,15% respondents were neutral whereas 10% indicated it occurred on a high frequency, also 22.5% said it occurred on a very high frequency.

5% of the respondents indicated incorrect work procedure on the part of workers occurred on a very low frequency, while 10% said it occurred on a low frequency, however,15% respondents were neutral whereas 30% indicated it occurred on a high frequency, also 45% said it occurred on a very high frequency.

The analysis from table 4.5 reveals that majority of the above listed factor contributes immensely to the of causes of non compliance of occupational health and safety on construction firms.

4.4 BEST PRACTICES USED TO ENSURE COMPLIANCE OF HEALTH AND SAFETY IN THE CONSTRUCTION INDUSTRY

Section Three (3) of this chapter presents data on the best practices used to ensure compliance of health and safety in the construction industry.

Table 4.6 Records of injury of workers on site and the causes

Response	Frequency	Percent

Always	5	12.5
Sometimes for every accidents	10	25
Only for serious injury	15	37.5
Not all	10	25
Total	**40**	**100**

At this stage the researcher sought to find out if firms kept injury records of workers on site. Table 4.6 above reveals that majority of the respondents representing 37.5% indicated they only keep record of serious injuries while 10% revealed they sometimes record for every month, also, another 10% respondents revealed they do not record injuries of workers on site.

The data above reveals though some construction firms do not keep records of injury, majority of the firms keep records on serious injury.

Table 4.7 safety trainings for workers

Response	Frequency	Percent
For every new project	7	17.5
Every month	5	12.5
On yearly basis	8	20

When necessary	20	50
Total	**40**	**100**

The above table indicates how often construction companies carry out health and safety training for workers. The results indicate that Majority (50%) mentioned it was only carried out when necessary. 20% mentioned it was carried out on yearly basis while 17.5% revealed it was carried for every new project, however, 12.5% indicated that it was carried out every month.

It can be deduced from the above table that construction companies carry out health and safety training for workers when necessary.

Table 4.8 Performance of best health and safety practices during construction activities

Practice	Always	Never	Not for all const. activities	Total
	No. (%)	No. (%)	No. (%)	No. (%)

Wearing of helmets	8(20.0)	2(5.0)	20(50.0)	40(100)
Wearing of hand gloves	30(75.0)	7(17.5)	3(7.5)	40(100)
Wearing of protective overall	17(42.5)	6(15.0)	17(42.5)	40(100)
Wearing of safety booth	20(25.0)	5(12.5)	15(37.5)	40(100)
Wearing of safety goggles	25(62.5)	5(12.5)	10(25)	40(100)

The table above shows the performance of practices during construction activities in construction firms in the Accra Metropolis.

The results revealed that 20% respondents indicated they always wear helmets while 5% said they never wear helmets, however, 50% revealed that they do wear helmets but not for all construction activities.

75% respondents stated they always wear hand gloves while 17.5% said they never wear hand gloves ,however, 7.5% revealed that they do wear hand gloves but not for all construction activities.

42.5% respondents stated they always wear protective overall while 15% said they never wear protective overall, however, 42.5% revealed that they do wear protective overall but not for all construction activities.

25% respondents stated they always wear safety boots while 12.5% said they never wear safety boots ,however, 37.5% revealed that they do wear safety boots but not for all construction activities.

62% respondents stated they always wear safety goggles while 12.5% said they never wear safety goggles, however, 25% revealed that they do wear safety goggles but not for all construction activities.

Deductions made from the above table are that, with the exception of helmets which workers indicated they use but not for all construction activities, the wearing of; hand gloves, protective overall, safe boots and safety goggles were protective equipment that were always used by workers in the course of their duty.

Table 4.9 **Provision of personal protective equipment**

Safety Gadget	Always No. (%)	As and when required No. (%)	Only when inspectors are on visit No. (%)	Workers to provide their own No. (%)	Never provided No. (%)	Total No. (%)

Helmets	17(42.5)	13(32.5)	5(12.5)	3(7.5)	8(20.0)	40(100)
Hand gloves	10(25.0)	20(50.0)	8(20.0)	2(5.0)	2(5.0)	40(100)
Protective overall	9(22.5)	10(25.0)	6(15.0)	7(17.5)	0(0.0)	40(100)
Safety booth	15(37.5)	10(25)	10(25)	3(7.5)	2(5.0)	40(100)
Safety goggles	25(62.5)	9(22.5)	0(0.0)	6(15.0)	0(0.0)	40(100)

At this stage the researcher sought to find out whether construction firms provide safety materials for workers during construction works.

The results revealed that 42.5% firms indicated they always provide helmets, 32.5% said they only provide as and when required, also, 12.5% stated they only provide when inspectors are on visit whereas 7.5% said workers are to provide their personal helmets, however, 20% indicated they never provide helmets.

25% firms indicated they always provide hand gloves, 50% said they only provide as and when required, also, 20% stated they only provide when inspectors are on visit whereas 5%

said workers are to provide their personal hand gloves, however, 5% indicated they never provide hand gloves.

22.5% firms indicated they always provide protective overall, 25% said they only provide as and when required, also, 15% stated they only provide when inspectors are on visit whereas 17.5% said workers are to provide their personal protective overall, however, none indicated they never provide protective overall.

37.5% firms indicated they always provide safety boots, 22.5% said they only provide as and when required, also, 25.5% stated they only provide when inspectors are on visit whereas 7.5% said workers are to provide their personal safety boots, however, 5% indicated they never provide safety boots.

62.5% firms indicated they always provide Safety goggles, 25.5% said they only provide as and when required, also, none stated they only provide when inspectors are on visit whereas 15.0% said workers are to provide their personal Safety goggles, however, none indicated they never provide Safety goggles

Table 4.10 Provision of safety Department in your company

Response	Frequency	Percent
Yes	17	42.5
No	23	57.5

Total	**40**	**100**

The researcher sought to find out if construction companies in the Accra Metropolis that had safety departments. From the above table, 42.5% respondents gave a "Yes" response while 57.5% gave a "No" response. It is evidence from the above table that majority of the companies do not have a safety department.

Table 4.11 Bases of safety department formation

Response	Frequency	Percent
From inception of firm	4	17.39
When it became a requirement	5	21.74
To protect staff from possible injury	7	30.43

To protect the company from possible liabilities	7	30.43
Total	**23**	**100**

The researcher proceeded to inquire from respondents the basis on which the safety departments were found.

The data revealed that majority of the respondents representing 37.5% indicated it was formed to protect staff from possible injury and protect the company from possible liabilities respectively, 21.74% said it was formed when it became a requirement while 17.39 indicated it was formed from the inception of the firm.

This shows that the few firms that had safety department formed it in the of staff and the company

Table 4.12 Measures in ensuring best practices on occupational health and safety on construction sites

Measure	Not important No. (%)	Neutral No. (%)	Important No. (%)	Very important No. (%)	Total No. (%)
Consideration of health safety matters during design	0(0.0)	2(.50)	6(15.0)	30(80.0)	40(100)

Top management concerned with safety of workers on site	0(0.0)	1(2.5)	5(12.5)	34(85.0)	40(100)
Investigations into causes of injury and accidents / injury	0(0.0)	1(2.5)	10(25)	29(72.5)	40(100)
Keeping construction site tidy	0(0.0)	4(10.0)	11(27.5)	25(62.5)	40(100)
Training of workers on safety and health practices	0(0.0)	0(0.0)	10(25)	30(75.0)	40(100)
Safety auditing by safety committees	0(0.0)	3(7.5)	7(17.5)	30(75.0)	40(100)
Assignment of safety responsibility to all levels of management	0(0.0)	5(12.5)	5(12.5)	30(75.0)	40(100)

The table above indicates the level of importance of importance measures to ensuring best practices on occupational health and safety in construction industries.

The data explains that on the issue of considering health safety matters during design, none of the respondents indicated that it was not at all important, 5% were neutral on the issue while 15% indicated it was important, however 80% representing the majority said it was very important.

With regard to top management being concerned with safety of workers on site, none of the respondents indicated that it was not at all important, 2.5% were neutral on the issue while 12.5% indicated it was important, however 85% representing the majority said it was very important.

On the issue of investigating into the causes of injury and accidents, none of the respondents indicated that it was not at all important, 2.5% were neutral on the issue while 25% indicated it was important, however 72.5% representing the majority said it was very important.

On the issue of keeping construction site, none of the respondents indicated that it was not at all important, 10% were neutral on the issue while 27.5% indicated it was important, however 62.5% representing the majority said it was very important.

Training of workers on safety and health practices had the following responses none of the respondents indicated that it was not at all important and neutral respectively on the issue while 25% indicated it was important, however 75% representing the majority said it was very important.

Safety auditing by safety committees had the following responses, none of the respondents indicated that it was not at all important, 7.5% were neutral on the issue while 17.5% indicated it was important, however 75.0% representing the majority said it was very important.

Assignment of safety responsibility to all levels of management brought out the following responses, none of the respondents indicated that it was not at all important, 12.5% were

neutral on the issue while 12.5% indicated it was important, however 75.0% representing the majority said it was very important.

4.5 CHALLENGES IN ADHERING WITH OCCUPATIONAL HEALTH AND SAFETY IN THE CONSTRUCTION INDUSTRY

This Section focuses on the challenges that hinder the operation of occupational health and safety on construction firms.

Table 4.13 Influential challenges on occupational health and safety

Challenge	Not Influential No. (%)	Less influential No. (%)	Quiet influential No. (%)	Influential No. (%)	Very influential No. (%)	Total No. (%)
Inadequate resources	0(0.0)	0(0.0)	10(25.0)	14(35.5)	16(40.0)	40(100)
Health and safety activities restricted to technical experts	3(7.5)	2(5.0)	6(15.0)	15(37.5)	14(35.5)	40(100)
Inadequate training of employees in health and safety consultations	0(0.0)	0(0.0)	6(15.0)	7(17.5)	27(67.5)	40(100)
Extensive casual and part time workforce	1(2.5)	2(5.0)	7(17.5)	27(67.5)	12(30.0)	40(100)

The challenges that hinder the operation of occupational health and safety on construction firms in the Accra Metropolis are represented in the above table. Respondents in the construction industry were asked to indicate a like art scale which challenge is most influential.

On inadequate resources, none of the respondents said it was not influential and less influential respectively, 25% said it was quiet influential whereas 35.5% indicated it was influential ,however, 40% representing the majority said it was very influential.

With regards to health and safety activities restricted to technical experts, 7.5% of the respondents indicated that it was not influential, 5.0% said it was less influencial,however,15.0% indicated it was quiet influential, whereas, 37.5% representing the majority said it was influential. Also 35.5% indicated it was very influential

On the issue of Inadequate training of employees in health and safety consultations, none of the respondents said it was influential and less influential respectively, 15% said it was quiet influential whereas 17.5% indicated it was influential ,however, 67.5% representing the majority said it was very influential.

Focusing on extensive casual and part time work force, 2.5% of the respondents indicated it was not influential, 5.0% said it was less influencial,however,17.5% indicated it was quiet influential, whereas, 67.5% representing the majority said it was influential. Also 30.0% indicated it was very influential.

Table 4.14 Hindrances to Contractors complying occupational health and safety

Response	Frequency	Percent
Very well	12	32.0
Somehow	10	25.0

Neutral	6	15.0
Not at all	11	27.5
Total	40	100

At this stage the researcher sought to find out if respondents considered complying occupational with health and safety on construction sites. The table above reveals that majority of the respondents representing 32% indicated cost is very well a hindrance, 25% responded "somehow" whereas 15% respondents were neutral, however, 27.5% said cost is not at all a hindrance.

Table 4.15 Training of workers as a challenge to contractors with occupational health and safety

Response	Frequency	Percent
Very well	3	7.5

Somehow	14	35.0
Neutral	7	17.5
Not at all	16	40.0
Total	**40**	**100**

At this stage the researcher sought to find out if respondents considered training of workers as a challenge to Contractors with occupational health and safety. The table above reveals that 7.5% indicated training is very well a challenge, 35% responded "somehow" whereas 17.5% respondents were neutral, however, 40% representing the majority said training of workers is not at all a challenge to contractors with occupational health and safety.

Table 4.16 Compliance with health and safety regulations

Response	Frequency	Percent
Strongly agree	4	10.0
Agree	6	15.0

Disagree	12	30.0
Strongly disagree	18	45.0
Total	**40**	**100**

On the issue of compliance with health and safety regulations on site being a challenge resulting in none-compliance, 10% respondents indicated they strongly disagree, 15% were in agreement whereas 30% disagrees however 45% representing the majority responded they strongly disagree

Table 4.17 factors posing challenge to compliance of occupational health and safety on construction

Factor	Strongly Agree No. (%)	Agree No. (%)	Neutral No. (%)	Disagree No. (%)	Strongly disagree No. (%)	Total No. (%)

Inadequate resources	15(37.5)	16(40.0)	5(12.5)	2(5.0)	2(5.0)	40(100)
Extensive casual work force	12(30.0)	18(45.0)	5(12.5)	3(7.5)	2(5.0)	40(100)
Contractor relations with management	0(0.0)	2(5.0)	6(15.0)	7(17.5)	25(62.5)	40(100)
Internal organizational factors	18(45.0)	12(30.0)	3(7.5)	5(12.5)	2(5.0)	40(100)

Focusing on the factors that can pose challenges to compliance of occupational health and safety on construction sites, respondents were asked to rank on a like art scale their agreement of the above listed factors which is most influential.

On the issue of inadequate resources, 37.5% of the respondents indicated they strongly agree, 40% representing the majority said they agree, however, 12.5% were neutral, whereas, 5.0% indicated they disagree while 5.0% indicated they strongly disagree.

In respect of extensive casual work force, 30% of the respondents indicated they strongly agree, 45% representing the majority said they agree, however, 12.5% were neutral, whereas, 7.5% indicated they disagree while 5.0% indicated they strongly disagree.

Also on the issue of contractor relations with management, none of the respondents indicated they strongly agree, 5% said they agree, however, 15% were neutral, whereas, 17.5% indicated they disagree while 62.5% representing the majority indicated they strongly disagree.

Internal organizational factors had the following responses, 45% representing majority of the respondents indicated they strongly agree, 30% said they agree, however, 7.5% were neutral, whereas, 12.5% indicated they disagree while 5% indicated they strongly disagree.

4.6 SUMMARY

The findings and analysis of the pragmatic data obtained from this research was presented in this chapter. The data analysis covered areas such as the background of respondents which showed that respondents understood the various practices involved in occupational health and safety.

The next chapter presents the conclusions that have drawn from the study and proposed a set of recommendations for further study.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 INTRODUCTION

Health and Safety is a crucial part of sustainability of the construction industry. To safeguard the health and well being of the workers and the entire community. The well being of the employees is the cornerstone of sustainability of the construction industry. It is particularly important to the industry as more and more opportunities are opened to the young generation.

5.2 SCOPE OF INVESTIGATIONS

The area of the study was the effects of non- compliance of health and safety regulation by building contractors in Ghana. Contractors with the classes of D1K1 to D4K4 were the main target to determine the extent of effects of not complying with occupational health and Safety as well as coming out with the best practices and challenges faced by the various classes of contractors hindering from complying with the regulations in occupational health and safety in the building construction industry. The study adopted a survey strategy using questionnaires as the main data collection instrument. This approach was considered to help the researcher to obtain the good results from for the study. The use of literature review enabled the researcher to obtain very good bases for coming out with the required questionnaire which was distributed to contractors of the various classes of which responses were analyzed using the Statistical Package for Social Sciences (SPSS) to obtain the needed results.

5.2.1 Objective # 1: Determine the effects and causes of non-compliance of occupational health and safety regulations the building construction in Ghana.

Analysis from responses from questionnaire on the above objective proved that 40% of the construction workers involved in the study proved to the researcher that non compliance to occupational health and safety results in several negative circumstances such as death injury and loss of profit due to delays as a result of accidents. Workers again agreed to the fact that improper site management, lack of warning signs on danger zones and working without safety gadgets could be some of the factors resulting in accidents due to non compliance of occupational health and safety. From table 4.5 It was proved that worker negligence, poor site management, lack of warning signs on dangerous sites, working without safety gadgets lack of workers knowledge and working with equipment without safety devices are some of the major causes of non compliance to occupational health and safety on construction sites.

To this extent of responses, it can be concluded that this objective has been met.

5.2.2 Objective # 2 Determine the best health and safety practices used in the construction industry

Findings on best practices which should be paramount on construction sites by contractors was lower than expected, findings in table 4.6 shows that contractors do not border much by keeping records on every accident that occurs on sites, but mostly on serious ones which indicates that, carrying out investigations to come out the causes will have a major focus on serious accidents by most companies. Also It was also observed that most contractors only

carry out health and safety training for workers when necessary which indicates most contractors do not update their workers on occupational health and safety expect when necessary. With the respondents view on the above objective It can be concluded that contractors are aware of the best practices of occupational health and safety for construction works, thus the achievement of the second objective of this study.

5.2.3 Objective # 3 Challenges in adhering to occupational health and safety standards on building construction sites in Ghana

Although there are benefits associated with compliance of occupational health and safety policies employees are faced with challenges such as Inadequate training of employees in health and safety, extensive casual and part time workforce of which all amounts to construction workers not been able to adhere to occupational health and safety. Analysis from table 4.13 justify that some contractors are not been able to adhere to occupational health and safety regulations due to some of these mentioned challenges which poses as obstacles. From table 4.14 Most respondents agreed to the fact that cost is a factor and a challenge to contractors for not been able to comply with occupational health and safety regulations, however most respondents strongly disagreed to the fact that complying with occupational health and safety should not be a challenge. With reference to the above views of the respondents and the results obtained from the analysis carried by the use of the SPSS it can be established that the third objective has been achieved.

5.3 SUMMARY OF EVALUATION

The overall aim of the study was to determine the effects and causes of non- compliance of health and safety regulation by building contractors in Ghana. With the achievement of all the objectives of the study, it can be concluded that, the aim of the study has been accomplished.

5.4 LIMITATIONS OF THE STUDY

The study focused only the effects of non- compliance of health and safety regulation by building contractors in the Greater Accra Region of Ghana

5.5 CONCLUSION

The study revealed that construction workers suffer several effects due to non compliance of occupational health and safety. As seen in table 4.4 it is quite apparent that construction workers suffer various types of effects which usually have a negative impact on their lives and this indeed confirms the statement made by Maloney (2012) that most construction workers suffer various degrees of effects due to non compliance of occupational health and safety. The situation of non compliance in the United Kingdom as expressed by Wilhelm (2012) is not different from what is happening in the Accra. For example Ghana web (2014) reported that a worker of Devtraco Limited met his untimely death when he was grinded to death by a concrete mixer due to non compliance of occupational health and safety.

As seen in table 4.6 keeping of records on every injury that occurs on site was not paramount in the daily practices of construction workers unless for serious ones and indeed this practice has made it very difficult to obtain a very good data on the various accidents that on as result of non compliance, their causes and effects on sites in Accra thus making it very easy for contractors to escape payment of fines from the law court as practiced in the United Kingdom (PP Construction Limited, 2014).

The research again revealed that the current state of health and safety on construction sites in Accra is very serious as there is lack of structures and procedures at almost all the levels of the construction chain. The formation of health and safety department in a construction company in Accra is not seen as an important issue (Table 4.1) and this can be derived from the fact that there is lack of strong and appropriate health and safety legislation for governing construction work and site operations in Ghana. It can also be seen that only two Acts operates on health and safety in Ghana (i.e. the Labour Act, 2003 and the Factories, Offices and Shops Act, 1970) which provide some form of regulatory instruments for ensuring health and safety on construction sites. Most workers interviewed confirmed that their sites have never been visited by any officer from a regulatory body on health and safety which depicts that the responsible regulatory bodies are not properly resourced to undertake the duty of ensuring occupational health and safety on construction sites in Accra.

Finally it can be concluded that there is a big problem with the enforcement and ensuring best practices on occupational health and safety on construction sites in Accra and Ghana as a

whole which needs to be addressed to reduce the high level of non compliance of occupational health and safety in the construction industry.

5.6 RECOMMENDATIONS

In view of the level of non compliance of the occupational health and safety policies or practices and the challenges associated with them, the following recommendations have been made:

1. Safety officers should visit construction sites regularly to ensure the daily practice of occupational health and safety policies.
2. The ministry of water resource works and housing in conjunction with various local authorities such as the District Assemblies should impose fines on construction companies who flout the Health and safety law.

5.7 RECOMMENDATIONS FOR FURTHER RESEARCH STUDIES

The study focused on effects of non- compliance of health and safety regulation by building contractors in Ghana. It is recommended that a similar study be conducted with the focus on Occupational health and safety on Roads.

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APPENDIX : RESEARCH QUESTIONNAIRE

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF ARCHITECTURE AND PLANNING

DEPARTMENT OF BUILDING TECHNOLOGY

MSc CONSTRUCTION MANAGEMENT

This questionnaire is for the purpose of investigating into the effects of non-compliance of occupational health and safety regulations on building construction site. It is meant for academics use, your input would assist the researcher to achieve his aim and objectives of the research.

Please tick ☐ or fill as appropriate

SECTION 1 – BACKGROUND OF RESPONDENT

Please provide the following personal date

1. Class of company……

2. Job title or respondent ……

3. How many years have you been in the Construction industry?
   Less than 2 years [ ] 2 – 6 years [ ] over 6years [ ]

4. Academic qualification

   (A) Graduate Level [ ]

   (B) Diploma Level [ ]

   (C) Secondary Level [ ]
   (D) Technician Level [ ]

SECTION 2

EFFECTS AND CAUSES OF NON CONPLIANCE WITH OCCUPATIONAL HEALTH AND SAFETY

1. Rank on likeart Scale 1-5 how frequently do you experience the following effects

EFFECTS	**1**	**2**	**3**	**4**	**5**
Injury due to falls					
Injury due electric shocks					
Injury due to vehicular movement					
Death					
Delays in work execution due to injury of worker					
Extra cost due to payment of compensation to injured victims					

2. Indicate on the likeart Scale 1-5 the level of contribution of the following factors to non compliance of occupational health and safety on your construction sites.

1	2	3	4	5
Very low contribution	Low contribution	Neutral	High contribution	Very high contribution

FACTOR	1	2	3	4	5
Workers negligence					
Poor site management					
Lack of workers' knowledge					
Working without safety gadgets					
Failure to use their PPE					
Equipment without safety devices					
Incorrect work procedure					

SECTION 3

BEST PRACTICES USED TO ENSURE COMPLIANCE OF HEALTH AND SAFETY IN THE CONSTRUCTION INDUSTRY

Please Tick as appropriate.

1. Does your firm keeps records of injury of workers on site and the causes

(A) Always (B) Sometimes for every accidents (B) Only for serious injury (D) Not all

2. How often does your company carry out health and safety trainings for workers

(A) For every new project (B) Every month

(C) on yearly basis (D) when necessary

3. Please indicate by ticking as appropriate the performance of the practices below during construction activities.

1	2	3
Always	Never	Not for all const. activities

Practice	1	2	3
Wearing of helmets			
Wearing of hand gloves			
Wearing of protective overall			
Wearing of safety booth			
Wearing of safety goggles			

4. Does your firm provide the following safety materials for workers during construction works? Please tick as appropriate

1. Always
2. As and when required
3. Only when inspectors are on visit
4. Workers to provide their own
5. Never provide

	SAFETY GADGET	1	2	3	4	5
1	Helmets					
2	hand gloves					
3	Protective overall					

4	safety booth					
5	Safety goggles					

5. Do you have a safety Department in your company?

   (a) Yes (b) No

   (b)

6. If yes on which bases was it found.

   (a) From inception of firm (b) when it became a requirement (c) to protect staff from possible injury (d) to protect the company from possible liabilities.

7. Indicate on the likeart Scale 1-5 the level of importance of the following measures to in ensuring best practices on Occupational health and safety on your construction sites

1	2	3	4
Not important	Neutral	Important	Very important

Measure	1	2	3	4
Consideration of health safety matters during design				

Top management concerned with safety of workers on site				
Investigations into causes of injury and accidents / injury				
Keeping construction site tidy				
Training of workers on safety and health practices				
Safety auditing by safety committees				
Assignment of safety responsibility to all levels of				
management				

SECTION 4

CHALLENGES IN ADHERING WITH OCCUPATIONAL HEALTH AND SAFETY IN THE CONSTRUCTION INDUSTRY

Below are challenges that hinder the operation of occupational health and safety on construction sites

1. Rank on a likeart scale of 1 to 5 which challenge is most influential.

1	2	3	4	5
Not influential	Less influential	Quite influential	Influential	Very influential

CHALLENGE	**1**	**2**	**3**	**4**	**5**
Inadequate resources					
Health and safety activities restricted to technical experts					
Inadequate training of employees in health and safety consultations					

Extensive casual and part time workforce					

2. Please indicate by ticking as appropriate do you consider cost as a hindrance to

Contractors complying occupational health and safety on construction sites.

(A) Very well (B) Somehow (C) Neutral (D) Not at all

3. Please tick as indicated below, do you consider training of workers as a challenge to

Contractors with occupational health and safety.

(A) Very well (B) Somehow (C) Neutral (D) Not at all

4 . Do you agree to the fact that compliance with health and safety regulations on site can be a challenge resulting in non-compliance?

.

(A) Strongly agree (B) Agree (C) Disagree (D) Strongly disagree

5. Do you agree to the fact that the following factors can pose a challenge to compliance of occupational health and safety on your construction sites, Indicate on the likeart Scale 1-5

1	2	3	4	5
Strongly Agree	Agree	Neutral	Disagree	Strongly disagree

Factor	1	2	3	4	5
Inadequate resources					
Extensive casual work force					
Contractor relations with management					
Internal organizational factors