**TITLE**

# ATTITUDE OF WORKERS TOWARDS INDUSTRIAL SAFETY PRACTICES OF COMPANIES IN KADUNA INDUSTRIAL AREA

**BY**


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## DECLARATION

I declare that the work in this thesis entitled ATTITUTE OF WORKERS TOWARDS INDUSTRIAL SAFETY PRACTICES OF COMPANIES IN KADUNA INDUSTRIAL AREA has been carried out by me in the Department of Sociology, Ahmadu Bello University, Zaria. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at this or any other Institution.

**Danlami, HUSSEINI** _____ _____
August, 2015 (Signature) Date

## CERTIFICATION

This thesis entitled ATTITUTE OF WORKERS TOWARDS INDUSTRIAL SAFETY PRACTICES OF COMPANIES IN KADUNA INDUSTRIAL AREA BY DANLAMI HUSSEINI meets the regulations governing the awards of the degree of a Master of Science (M.Sc.) in Sociology of the Ahmadu Bello University, Zaria, and is approved for its contribution to knowledge and literary presentation.

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## DEDICATION

This work is dedicated to my late parents:

Alhaji Husseini Alfa and Halimat Kaka Husseini.

May their souls rest in perfect peace.

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## ABSTRACT

The study is primarily focused on Workers' Attitudinal dimension towards promoting industrial safety. The human element of industrial safety as a concept is extremely popular topic at national and regional safety conferences. Safety professionals realize that reducing industrial accidents to below current levels requires increased attention to human factors. Most attempts to deal with the human aspects of safety have been limited in scope with little attention on the issues of nature of industrial accident, attitude of workers towards industrial safety, accident preventive measures and socio-cultural factors towards industrial safety that constitute the objectives of this study. This study was conducted at five (5) manufacturing companies in Kaduna industrial area, Nigeria. The methodology was based on the survey instrument (questionnaire), in-depth interview, and observations that were designed to achieve objectives of the study through responses (data) gathered from the field. A sample size of 300 was determined out of 768 sample frame of the study population for research instruments administration, but only 250 copies of questionnaire were retrieved with a sampling accuracy of 5 percent and confidence level of 95 percent. Stratified random sampling was used in determining sample size of study population into five strata (sections), namely: Management/Specialists, Supervisors/Foremen, Operatives/Charge hands, Clerical/secretarial, and Security/Cleaners as unit of analysis. The data were later analyzed and discussed by using percentage of distribution and statistical analysis. The result of the major findings revealed that increasing rate of workplace accidents are due to the fact that industrial safety programmes and policies were not properly implemented and monitored through work-related attitudes that cause the majority of industrial accidents and most of the workers were ignorant of the existing safety policy. This calls for a proper monitoring and supervision of job attitude towards promoting industrial safety practices at workplace.

# CHAPTER ONE
# INTRODUCTION

## 1.1 Background of the Study

Industrial safety as a concept is a means of protecting and maintaining the physical, psychological and health of workers in the industry. It is primarily concerned with the study of factors or conditions influencing the health and well-being of workers not only in the place of work but also at home with the aim of promoting health, safety and welfare of the workers and their family.

The joint International Labour Organization (ILO) and the World Health Organization (WHO) committee constituted in 1950 and revised in 1995 defined industrial safety within the context of Occupational Health and Safety (OHS) as the "promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupation". ILO reported at the 17th World Congress on Safety and Health at Work (2013) that 337 million accidents happen on the job each year, and some 2.2 million people die of work-related accidents and diseases annually, adding this number may be vastly under estimated due to poor reporting and coverage systems in many countries, particularly in developing countries of Africa and Asia where the number of work-related accidents, illnesses and deaths appear to be increasing as a result of rapid changes of technological advancement and strong competitive pressures of globalization.

Attitude represents one of those social science concepts which lack a common definition. According to Orok (2013), it has come to signify many things to many writers with the inevitable result that its meaning is somewhat indefinite and its scientific status called into question. He however defines it as a mental and neutral state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which he is

related. This definition denotes that attitudes are characterized by a predisposition or state of readiness to act or react in a particular way to certain stimuli.

Job-related attitudes have been the subject of research for a much longer time, largely because of the preoccupation of industrial sociology in human related factors in industry. Going by the global agitation for a good working condition for workers by the labour movement, a lot of attention has focused on the causes of occupational incidents. When incidents occur in the workplace it is important to understand what factors (human, technical, organizational) may have contributed to the outcome in order to avoid similar incidents in the future.

Safety experts viewed workers' attitude as one of the factor in reducing industrial accidents under a term known as 'safety culture'. Safety culture is a term used to describe the way in which safety is managed in the workplace, and often reflects "the attitudes, beliefs, perceptions and values that employees share in relation to safety". (Cox and Cox, 1991).

Most attempts to deal with the human aspects of safety have been limited in scope, and both behaviour based and attitude-oriented approaches to accident prevention have been faulted in order to predict a broader approach. Many trainers and consultants claim to have answers to the human side of safety but their solutions are too often impractical, shortsighted, or illusory. And to support their particular programme, consultants, authors, and conference speakers often give unfair and inaccurate criticism of alternative methods.

In a speech delivered at 17$^{th}$ World Congress on Safety and Health (2013), Juan Somavia, 9$^{th}$ Director-General of ILO stated that occupational safety and health is vital to the dignity of work. Still, every day, on average, some 5,000 or more women and men around the world lose their lives because of work-related accidents

and illnesses. According to him, decent work must be safe work, and working environments are a long way from achieving that goal.

In developing countries including Nigeria, people are living in the vicious cycle of poverty and disease. This brought about establishment of various industries for economic progress to break the cycle of poverty and disease. The invention and application of new tools and introduction of new machines for mass production brought about untold pains, and industrial accidents not anticipated. Examples of such problems included respiratory, renal, injuries/bruises, lacerations; puncture wounds, electrocution, fractures, amputation, gastrointestinal problems and other industry-related accidents. Apart from human and material loss associated with these problems, the rate of working time and economic loss is high. In practice, industrial safety addresses moral and economic issues-typical within a framework required by law. Occupational Safety and Health (OSH) in Nigeria is traced back to the slave trade period. Before independence, industrial legislation in Nigeria was Workmen's Ordinance of 1941, Labour Code Ordinance of 1945 and Factories Act of 1955 revised in 1958 that were modelled in the same pattern as in Britain; the situation has not changed but the basic document has changed minimally from colonial days. From time-to-time, there had been amendment of one section of the act after another as Asogwa (2007:52) puts it:

> *The most significant change was the coming into law of the Factories Act Cap 126, Laws of the Federation of Nigeria, 1990 on account of the deficiencies of the Factories Act of 1958. It is the legislation for the enforcement of safety and health standards in Nigerian workplaces. It provides minimum standards of safety and health in Nigerian Factories. It also provides for the enforcement of the Act by occupational safety and health officers in the Inspectorate Department of the Federal Ministry of Labour and Productivity.*

Enforcement of regulations is very vital in ensuring the efficacy of regulations. Thus, researchers (like Idubor and Osiamoje, 2013) opine that regulations without proper enforcement are tantamount to no laws. In that Idubor and Osiamoje (2013) postulate that lack of strict enforcement of Occupational Safety and Health (OSH) regulations enables non- compliance to safety policies in Nigeria. On the other hand, it is argued that enforcement and compliance with OSH regulations are not the standalone steps for improving workplace safety, as improving organisational culture can also improve it. However, it is worth noting that the benefits of proper enforcement of OSH regulations are evident in countries with remarkable health and safety records like the UK, USA, Germany and many other developed countries, which in turn support Anderson (2007); Diugwu et al. (2012); Idubor and Osiamoje's (2013) arguments substantially.

The main objective of Occupational Safety and Health (OSH) legislation is to prevent accidents and ill health in the workplace, these justify the effectiveness and accountability in the enforcement of OSH rules and regulations. The Nigerian Federal Ministry of Labour and Productivity (Inspectorate Division) enforces OSH regulations while the National Council for Occupational Safety and Health will enforce the Labour, Safety, Health and Welfare Bill of 2012 in Nigeria when passed into law. So far, the efficacy and accountability of The Federal Ministry of Labour and Productivity in the enforcement of OSH regulations in Nigeria are evidently questionable and poor, especially in the construction industry. Perhaps, this is because OSH enforcement is not the principal practice in Nigeria.

In January 2011, the President of the Federal Republic of Nigeria signed Employee's Compensation Bill into law, the Employee's Compensation Act ("the Act" or "ECA") 2011, which repeals the Workmen's Compensation Act (WCA) of 2004. It

is designed to provide an open and fair system of guaranteed and adequate compensation for employees or their dependants in the event of death, injury, disease or disability arising out of, or in the course of, employment. The Act is also intended to provide for safer working conditions for employees by ensuring that all relevant stakeholders contribute towards the prevention of workplace disabilities and other occupational hazards. However, in spite of the efforts made by the Federal Ministry of Labour and Productivity to enforce these provisions, workplace accidents still occur that requires sociological investigation.

Studies in industrialized countries revealed that the causing agent of 90 percent of workplace accidents is human error and only 10 percent of those belong to unsuitable workplace and equipment (Ofuonye, 2004). He also lamented on the pathetic situation of incessant dozens of industrial accidents occurring in manufacturing industries in Nigeria on a monthly basis leading to loss of life, injuries, damage to material resources and hindrance to achievement of production target.

The quest for industrial growth in Kaduna state with the aim of promoting and encouraging the acquisitions of indigenous manpower skills sufficient to meet the needs of Nigerian economy, necessitate this study to aim at attitude of workers towards industrial safety practices of manufacturing companies in Kaduna industrial area where studies of this nature were rarely conducted.

## 1.2 Statement of the Research Problem

Increasing problems of industrial accidents posed by changes in technological advancement in industries call for radical approach towards industrial safety measures. From manufacturing, engineering, mining and construction through to utilities, transport and warehousing, employees in an industrial environment are exposed to a wide variety of work-related injuries, potential irritants, temperature

swings, and at times, difficult working conditions. These can lead to visible industrial accidents such as puncture wounds, bruises, scalds, sprains, contusions, fractures, dislocations, crush injuries, amputations, asphyxiation, lacerations, electrocution, fractures, head injuries and unspecified injuries among others.The costs of these problems in the industrial environments are not only affecting the well being of individual employee, but also business growth.

Everyday, on average, some 6,000 employees are killed around the world as a result of work related accidents and illnesses (Mark and James, 2010). The staggering number of employees involved in these incidents raises a real concern. Behind the numbers are real people like mothers, fathers, sisters, brothers, spouses, sons, or daughters. Industrial sectors in particular are susceptible to the devastating impact of workplace accidents. For instance, Broken Hill Proprietary (BHP) Billiton, an Anglo-Australian multinational mining, metals and petroleum Company missed its production targets for the year due to shutdowns resulting from seven deaths at mine sites during the 2009 financial year. As reported by the Australian Financial Review, [AFR] (2009:5), these fatalities have not only resulted in worse than expected production figures for BHP, but have also put the resources giant under pressure to address this safety record. Companies that fail to prevent accidents in the workplace may face similar issues.

In contrast, tools from Behaviour-Based Safety (BBS) have been critized in an attempt to justify a focus on people's attitudes or value. Promoters of Behaviour Based Safety (BBS) have ridiculed a focus on attitudes as being too subjective, unscientific, and unrealistic. And both behaviour based and attitude-oriented approaches to accident prevention have been faulted in order to vindicate a system or culture based approach. The truth of the matter is that both behaviours and attitudes

require attention in order to develop large scale and long term improvement in employee's safety and health.

An organization is a subset of an entity called society and each society has its own shared values and attitudes. Consequently, workers working within the organization constitute part of the organization. Thus, the said workers, invariably exhibit the society's attitudes and behaviours as expected of them. Therefore, organization's safety culture cannot stand without integral societal culture. In view of these societal forces that dictate the prevalent attitudes and behaviours relating to safety failed to meet the demand of organizational safety culture.

Opinions vary as to the most effective methods of preventing and predicting workplace accidents. As part of overall safety management, businesses have typically attempted to implement a safety culture in which employees work together to create a safe workplace. It has traditionally been thought that a strong safety culture leads to a safer workplace, and many work safety tests and assessments have been developed on the basis of the "safety culture" approach. However, the most recent research in the area of work safety suggests that existing measurements of work safety attitude may be missing the mark which deserves further sociological investigations.

Little evidence shows that the safety culture approach is actually related to employees' safety behaviour. A recent meta-analysis of work safety behaviour has reported that safety culture has little predictive power in relation to work accidents, and that safety culture has been oversold as the primary indicator of the quality of an organization's safety efforts.

Another cause for worry is the lack of statistical data that can help identify accident frequency by region, sector and severity and help inform decision makers on areas to strengthen regulations. Accident reporting is almost nonexistent and even

when reported, data are unavailable and no action is taken. Available statistics from Federal Ministry of Labour and Productivity show that less than 100 accidents were reported in 2001 to 2006 nationally, with the exception of 2005 in which 120 accidents were reported. This contradict what is applicable in developed countries where industrial accidents are often reported and usually investigated as measures of preventing workplace accidents.

Consequently, due to controversial issues among safety experts on the appropriate measure of controlling and preventing workplace accidents and lack of statistical data on industrial accidents for safety management, reccurrence of accidents and injuries are common in industry which cost the economy billions of dollars every year, and these costs are often underestimated by businesses. These include direct costs, such as fines, compensation payments, and costs for legal services, as well as indirect costs such as Occupational Health and Safety (OH&S) insurance premiums, increased turnover, loss of productivity and loss of income. In reality the amount of production required to cover costs associated with accidents in the workplace can be substantial and may far outweigh the expenses of providing a safe and health working environment.

In Nigeria, industrial accidents are usually under-reported, which makes it difficult to obtain an accurate number of accidents. In recent time, statistic has shown that workplace safety research were rarely carried out at Kaduna industrial area despite presence of high rate of industrial accidents and negligence of safety precautions due to controversial issues among safety experts on the appropriate measures of predicting and preventing workplace accidents. It is against this backdrop that this study is interested in investigating industrial safety from workers' attitudinal

dimension so as to promote safety attitude in workplace. Thus, the study seeks to provide answers to the following questions:

## 1.3 Research Questions

The followings are the research questions of this study:

i. What are the natures of industrial accident in Kaduna Industrial Area?

ii. What are the attitudes of workers towards industrial safety in Kaduna Industrial Area?

iii. What are the accident preventive measures in Kaduna Industrial Area?

iv. What are the socio-cultural factors towards industrial safety in Kaduna Industrial Area?

## 1.4 Objectives of Study

The broad objective of this study is to assess attitude of workers towards industrial safety practices of companies in Kaduna Industrial Area. However, the specific objectives are as follows:

i. To find out the nature of industrial accident in Kaduna Industrial Area;

ii. To examine the attitude of workers towards industrial safety in Kaduna; Industrial Area;

iii. To assess the accident preventive measures in Kaduna Industrial Area;

iv. To identify the socio-cultural factors towards industrial safety in Kaduna Industrial Area.

## 1.5 Scope of the Study

Workplace accident is a global problem; its alarming rate is high in developing countries than industrialized countries where adequate safety precautions are taken into consideration. For this reason, this research does not covered all but rather focus attention on Nigeria and particularly Industrial Area of Kaduna metropolis.

Beside several factors that caused physical accident at workplace, this research is mainly centred on workers' attitude towards industrial safety for a healthy working environment. Lack of reliable statistic on high rate of industrial accidents despite existing safety programmes and localization of major industries in Kaduna Industrial Area necessitate this study to map out the areas as its scope of study with a view to attaining workers' attitudinal dimension of industrial safety. Thus, this study is restricted to five (5) selected manufacturing industries in the Kaduna Industrial Area, namely:

i. Queenways Aluminum Company
ii. Tower Galvanize Products (TGP) Limited
iii. Northern Cable Processing and Manufacturing Company (NOCACO) Limited
iv. Kaduna Industrial Furniture and Carpet Company (KIFCC), and
v. 7up Bottling Company

The reason for selection of above mentioned companies for the study is their efficient mode of operations that reflect characteristic element of study population, unreported cases of industrial accidents and prevalence of some approaches to Safety Management System (SMS) that are heavily reliant on the use of authority, engineering solutions and punishment. These approaches emphasize the use of discipline and punishment to discourage unsafe behaviour, while safe behaviour that promotes most of industrial safety is largely ignored or not properly implemented through a comprehensive Safety Management System (SMS).

## 1.6 Significance of the Study

The role of safety in working environment cannot be over emphasized. Safety investment is profitable to any organization that deems to survive for a long time

alongside with its goal. The benefits of maintaining a safer work environment are many, but first and foremost, safety is about what you can do to protect your workers against industrial accidents. This practice brings financial benefits to the table. A safe work environment impacts a project's bottom line both directly and indirectly. Cost associated with incidents, including lost costs, worker's compensation claims, insurance costs and legal fees are minimized in a safe work environment. Base on these facts, the followings have been identified as significance of the study:

The study has established the proper ways of supervising and monitoring of right attitude on the job in related to implementation of industrial safety programmes and practices towards reducing industrial accident.

It has also served as a guide to policy makers such as Ministries, Departments and Agencies (MDAs) of Government saddled with the responsibility of formulating safety policy and regulating safety standard of working environment within social and cultural context so as to enhance high productivity.

Institutions of learning have ample opportunity to use this study as a gateway for further study on work-safety-attitude and also inculcate it into school curriculum.

Industrial Training Fund (ITF) as a foremost human capital development Agency of Federal Government of Nigeria, needs it to regulate safety training standard towards developing the nation's indigenous manpower required in both private and public sectors of the economy.

Nigerian Employers Consultative Association (NECA) being an umbrella association of employers of labour hopes to use findings of this study in order to assess effectiveness of attitude of workers towards industrial safety practices at workplace as panaceas for industrial growth.

On the whole, this study has provided some useful insights into industrial safety programmes/policies from workers' attitudinal dimension for greater understanding of attitudes, safe/unsafe behaviours, industrial safety practices, and the extent to which workers' attitudes and perception are associated with their culture towards preventing industrial accidents. It has also added to the understanding of the implications of Nigerian cultural values on industrial safety and provided new knowledge for safety professionals in dealing with human errors that caused most of industrial accidents.

## 1.7 Definition of Key Terms

Industrial safety:- It is the management of safety activities within a certain industry for the purpose of reducing risks and injuries in a certain occupational function.

Industrial accident:- An industrial accident is a discrete occurrence of unplanned events in the course of industrial activity leading to physical or mental injury.

Workers' attitude:- It is mental and neutral state of readiness of workers, organized through working experience that exert influence upon the individual worker's response to all objects and situations with which he is related in working environment.

Personal Protective Equipment (PPE):- Personal protective equipment, commonly referred to as "PPE", is equipment worn to minimize exposure to a variety of hazards. Examples of PPE include such items as gloves, foot and eye protection, protective hearing devices (earplugs, muffs) hard hats, respirators and full body suits.

Safety Management System (SMS):- A SMS provides a systematic way to identify hazards and control risks while maintaining assurance that these risk controls are effective.

Occupational Safety and Health (OSH) also commonly referred to as Occupational Health and Safety (OHS) is an area concerned with the safety, health and welfare of people engaged in work or employment.

# CHAPTER TWO
# LITERATURE REVIEW AND THEORETICAL FRAMEWORK

## 2.1 Introduction

This chapter reviewed some of the existing literature that captured the research objectives so as to bring out the extent of academic scholarship. Thus, literature is reviewed in accordance with the stated objectives to expose studies of different scholars. Similarly, Domino Theory is adopted as theoretical orientation of the study with a view to explaining attitude of workers towards industrial safety practices for an efficient Safety Management System (SMS).

## 2.2 Conceptual Literature Review

### 2.2.1 Industrial accident

An industrial accident is a discrete occurrence of unplanned events in the course of industrial activity leading to physical or mental injury. According to the International Labour Organization (ILO) reports on safety at work (2013), more than 337 million accidents happen on the job each year, resulting, together with occupational diseases, in more than 2.3 million deaths annually.

Industrial accidents and injuries are source of substantial human and economic cost. Available data reveal an alarming and extremely high rate of work-related deaths and injuries in both developed and developing nations. According to the latest data from the National Safety Council (NSC), 2004, industrial accidents cost USA's economy a staggering sum of US $156.2 billion, and an estimated number of 3,400,000 disabling injuries. Each week day a fatal injury occurs every 2 hours and a disabling injury every 8 hours. However, the period between 1912 and 2003 saw a substantial reduction in accidental deaths and workplace injuries, which in turn reduced the high rate of human and economic cost per 100,000 inhabitants. With a

workforce nearly quadrupled in size, estimated deaths fell from 21,000 to 4,500. This great stride was achieved by applying ergonomic methodology, and implementing risk assessment programmes and effective safety management policies. As distressing as it is, this report seems to be a small tip of a much larger iceberg, considering the high rate of under-reporting that goes on in developing nations, particularly those in Africa.

A fatal accident at work is defined as an accident which leads to the death of a victim. The time within which the death may occur varies among countries: In Netherlands an accident is registered as fatal if the victim dies during the same day that the accident happened, in Germany if death came within 30 days, while Belgium, France and Greece set no time limit. Where the accidents involve multiple fatalities they are often referred to as industrial disasters (ILO,2013).

Despite these burgeoning problems, little attention has been paid to industrial and occupational accidents and injuries in terms of research efforts and/or organized preventive intervention programmes. Efforts to combat the problem of industrial and occupational accidents in developing countries have been hampered by limited financial resources and lack of adequate data. In light of such limitations, prevention emerges as the most cost effective strategy to decrease disability and the high death toll in the workplace. It is therefore critical that the conventional antecedents of industrial mishaps, as well as the organizational factors that may affect worker safety at the workplace, are carefully examined. This need becomes more necessary when workplace injury-related deaths have been projected to be the second leading cause of death, worldwide, by the year 2020 (NSC, 2004).

There are unlimited numbers of hazards that can be found in almost any workplace, such as unguarded machinery, slippery floors or inadequate fire precautions, but there are also a number of categories of insidious hazards as follow:

- Chemical hazards, arising from liquids, solids, dusts, fumes, vapours and gases;
- Physical hazards, such as noise, vibration, unsatisfactory lighting, radiation and extreme temperatures;
- Biological hazards, such as bacteria, viruses, infectious waste and infestations;
- Psychological hazards resulting from stress and strain;
- Hazards associated with the non-application of ergonomic principles, for example badly designed machinery, mechanical devices and tools used by workers, improper seating and workstation design, or poorly designed work practices.

Adeogun and Okafor (2013) report that Occupational Safety and Health in Nigeria is still at infancy; in the same way, Diugwu et al. (2012) and Okolie and Okoye (2012) maintain that OSH in Nigeria is poor. For instance, although there are no reliable accident data in Nigeria (Idoro, 2008; Okolie and Okoye, 2012), a study by Ezenwa (2001) over a 10-year period (1987 to 1996) of fatal injuries reported to the Federal Ministry of Labour and Productivity (Inspectorate Division) shows that out of 3183 injuries reported, 71 were fatal. In fact between 1990 and 1994, the overall fatality rate as recorded by the Ezenwa (2001) is 22 percent of the above reported cases. This explains why Idoro (2011) in a study of 42 construction contractors in Nigeria, found that in 2006 the best safety record is 5 injuries per worker and 2 accidents per 100 workers. These records are high (Idoro, 2011) whether compared to

other countries or not. However, this is not a true representation of what obtains in Nigerian factories (Ezenwa, 2001) because the records are worse than stated above, as the poor OSH regulatory system in the country does not encourage mandatory reporting of accidents (Ezenwa, 2001; Idoro, 2008), which OSH regulations require. However, Diugwu et al. (2012) blame the big gap in OSH in Nigeria on the dysfunctional health and safety laws in the country. As a result, all the sectors in the country are clearly unregulated (Diugwu *et al.*, 2012).

### 2.2.2 Industrial safety

Industrial safety is primarily concerned with investigation of facts by logic and knowledge on a safe working condition to ensure that personnel and equipment operate harmoniously in a defined working environment which will not encounter unexpected or inadvertent events that would result in industrial accident. It is also the provision and maintenance of plant and systems of work in an industry that are safe and without risks to human health. Industrial safety is therefore understood in this study to mean the management of safety activities within a certain industry for the purpose of reducing risks and injuries in a certain occupational function.

The field of occupational Safety and health is concerned with preserving and protecting human and human resources in the workplace. Practitioners in the field try to prevent needless deaths and worker-related accidents. It is also concerned with improving organizational quality and efficiency. For example, safety professionals review the way products are moved from place to place and how to minimize product movement and redundant handling to reduce exposure to possible injuries. This approach not only benefits the employees in term of lower exposure to industrial accidents, but also tend to decrease processing times and improve the efficiency of operation. By reducing the number of times a product is touched, they may also

improve quality. Industrial safety professionals attempt to eliminate property and facility damage, waste, and cost that lessen an organization's ability to operate profitability (Mark and James, 2010).

Industrial safety is the core activity of Occupational Safety and Health (OSH) also commonly referred to as Occupational Health and Safety (OHS) or Workplace Health and Safety (WHS) is an area concerned with the safety, health and welfare of people engaged in work or employment. The goals of occupational safety and health programmes include to fostering a safe and healthy work environment. OSH may also protect co-workers, family members, employers, customers, and many others who might be affected by work-related risks. Since 1950, the International Labour Organization (ILO) and the World Health Organization (WHO) have shared a common definition of occupational health and safety. It was adopted by the Joint ILO/WHO Committee on Occupational Health and Safety at its first session in 1950 and revised at its twelfth session in 1995. The definition reads:

> *Occupational health and safety should aim at: the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention amongst workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities; and, to summarize, the adaptation of work to man and of each man to his job.*

The inception of OSH regulations/bills in Nigeria runs from the introduction of the Labour Act of 1974 to the passage of the Labour, Safety, Health and Welfare Bill of 2012 (which awaits the presidential assent). A bill is a formal statement that is designed to be a new law but is under debate before it is voted on (Cambridge dictionary 2013). After voting, it may also need presidential assent to fully complete the process of becoming a law or legislation. During the above period, the Factories

Act of 1987 (now known as Factories Act of 1990), which Kalejaiye (2013) reports as a substantial revision of the Factories Act of 1958 (i.e. colonial legislation), the Workman's Compensation Act of 1987, the Labour Act of 1990, the Workman's Compensation Act of 2004, the Employee's Compensation Act of 2011 (which repeals the Workman's Compensation Act of 2004) were introduced; some of these laws are criticised as inadequate. For instance, the Factories Act of 1987 does not include the construction industry in the definition of its premises (Diugwu *et al.*, 2012; Idoro, 2011); consequently, the industry remains unregulated. Idubor and Osiamoje (2013); Okojie (2010) contend that the severities of penalties stipulated by OSH laws in Nigeria are insignificant; in that offenders are not deterred by the penalties. Thankfully, the new Bill (The Labour, Safety, Health and Welfare Bill of 2012) addresses all the above issues, as it includes the construction industry in the definition of its premises and stipulates severe penalties for violation. This bill covers both the formal and informal industrial sectors in Nigeria. It seeks to repeal the Factories Act and serve as a comprehensive OSH legislation for the workplace.

Unfortunately, despite the existing industrial safety regulations that responsible for not only levy fine but also seek criminal prosecution of business owners and managers who willfully neglect the safety and health of their employees, many employers have not had to bear the full cost of injuries and killing members of their workforces. Workers uninformed and unaware of their legal rights; they have often shouldered the costs of business not operating safely (Mark and James, 2010).

### 2.2.3 Work attitude

Attitude has always been a subject of interest to many researchers in the field of social sciences. It is considered as exciting and mysterious to some researcher. Attitudes are propensities, or tendencies, to react in a favourable or unfavourable way

toward an object. The object could be almost anything in the world around us. Attitudes reflect a person's likes and dislikes towards other persons, objects, events and activities in their environment. It makes sense to study and know about attitudes because strong attitudes will very likely affect a person's behaviour; attitudes towards supervision, pay, benefits, safety, promotion or anything that might trigger positive or negative reactions. As a result, employee attitudes represent one of the key area of measuring organizational safety culture (Reason,1997).

Attitudes play a major part in determining a person's personality. This is because attitude affects the way people perceive and act towards people, objects or events that they encounter. Besides that, attitudes can also have an effect on one's social interactions. That is why it is important to know what attitude is, how it is developed and its impact on people. According to Orok (2013), attitudes are evaluative statements that have three components; affective, behavioral and cognitive. The cognitive component is the beliefs an individual holds. The emotional or feeling part of an attitude is the affective component, and the behavioural aspect is the intention component. In brief, it could be said that, attitude is a positive or negative evaluations or feelings that people have towards other people, objects, issues or events. Attitudes include the general way people feel towards socially significant objects and most attitudes are lasting. For example, if you were once bitten by a cat and you dislike the feeling at that moment, that emotional response is regarded as just a feeling. However, if your experience of getting bitten by a cat made you hate all cats, then your hatred for cats is considered an attitude that you have towards cats.

The "effective" component of an individual's attitude is the feeling of a particular individual towards an object. This is seen on the basis of the kinds of behaviour which indicate an individual's feelings, since feeling as a concept is vague.

Thus two behavioural manifestations of feelings are usually mentioned. The first is emotion e.g. rises in blood pressure and the second elates to verbal expressions e.g. saying that one likes or dislikes an object. We could therefore state that the effective component of attitude of an individual relates to the emotional reactions and verbal expressions of the individual to a given object.

The cognitive which is the second component, refers to the individual's knowledge or beliefs about a particular object. Thus this describes the object in some way. For example, an individual might say that an object (a person in this case is wicked). He has made a statement relating to the bad aspects of quality of the object. The statement of belief may also be directed to the future; a worker could, for instance, believe that the new factory manager will make things better for them. The third and final components of attitude which is the behavioural consists of the individual's overt non verbal actions towards an object. Thus, it is said that attitudes consist of the individuals "action tendencies" toward an object; action tendency should be seen as the deposition to take action of some kind. It is simply a readiness to display particular behaviour towards specific object. There is almost universal agreement that attitudes tends to have only a comparatively low relationship to actual behaviour towards the object of the attitude. Attitudes and behaviour are complex, one holds a particular attitude does not really mean that certain types of behaviour will occur (Azjen, 1980).

Attitudes are useful guides in determining safe behaviour at workplace. For instance, as in the words of Schuman et al. (1986), if attitudes and behaviour existed in entirely separate spheres, learning about attitudes would be of little practical values, whatever their interest from the stand point of total intellectual understanding. Attitude and behaviour are obviously not entirely on spheres after careful reviews of a

wide range of past studies. The discrepancy between attitudes and behaviour has been explained in the context of three arguments. The first is that the operational measures of attitude are inadequate since they do not take into consideration a multi-component conceptualization of attitudes. Secondly, variables other than attitudes may influence a person's behaviour, thereby making the attitude contract irrelevant to behavioural prediction. In the final argument, it is stated that the discrepancy is a consequence of the act of measuring attitudes towards object, person, and situation depends on the behaviour in question.

Previous studies have shown that job attitude has a positive impact on safety management. Work environments can change frequently as companies update work procedures, introduce improved technology that require safety precaution. Employees who display a positive attitude toward change may welcome and even embrace it, as they may view it as a chance to enhance their skills. As a result, they may adapt to change more quickly than an employee with a negative attitude that prone them to industrial accidents. In brief, it could be said that, attitude is a positive or negative evaluations or feelings that people have towards other people, objects, issues or events. Thus, work attitudes means the way workers feel towards working environment/situation and most attitudes are lasting (Schneider, 1988).

## 2.3 Empirical Literature Review

Morally, legally, and economically industrial safety has become important issues. Companies are attempting to remain profitable in an ever more competitive global economy. For these companies, addressing safety, health, and environment issues may mean more than good business practice. For many companies, strong safety, health and environment programmes may actually means survival. In this vein,

relevant corpuses of literatures were reviewed in related to the stated objectives of study as follows.

### 2.3.1 Nature of industrial accident

The nature of work performed by a person exposes him or her to accident associated with that occupation. Diverse occupations exist, they include traditional manufacturing industries (automobile. automotive and appliances); service industries (banking, health care, and restaurant); education, agriculture, construction, mining, and newly high technology firms like computer chips manufacturing companies and many others. Each of these occupations has peculiar accident associated with it. Accidents arising from manufacturing industries include amputation, lacerations, puncture wounds, electrocution, fractures, head injuries and sprains and so forth. Health institutions related accidents are: needle prick injuries, sprains, cuts from sharp instruments, slip disc, falls, fractures, anesthetics accidents, eye injuries, burns from acids and other chemicals. Agricultural occupation has recorded accidents such as cuts from hoe, knives, gunshot wound especially in land disputes, scorpion, human and animal bites like snake bite, drowning, falls, contusions etc. Accident in banking sectors are: back injuries, syncope, falls and others. Accidents do not just happened without a cause.

#### a. The Causes of Industrial Accident

The causes of accidents in workplace varied. Some of the causes are known while others are unknown. According to Reich and Okubo (1992) the causes could be as a result of: unsafe human behaviours, human error, environmental factors, defective machinery, and work characteristics.

Unsafe human behaviours according to Achalu, 2003 are the principal cause of up to 80% of industrial accidents. Causes include: Psychological and attitudinal

factors like anger, hatred, fear, anxiety, over confidence and joy. The relations to these factors can push the worker to ignore safety precautions and then act carelessly and recklessly thereby acting out what he/she could not in normal self. Complex personality traits such as attitude, exaggerated opinion of self importance; over confidence in self, abnormal need for excitement, employees with these traits tend to focus all their attention on themselves and act irresponsibly against themselves and others that disregard safety precautions, subject themselves and even others to accident. Unhealthy habit formation such as intake of self prescribed medical drugs like sedatives, tranquillizers, antihistamines, and so forth, may produce alteration in normal physical abilities causing drowsiness, confusion, sleepiness, blurred vision, perceptual problems that can lead to accident. Excessive alcohol intake interferes with the body's psychological processes, alter the person's mood, attention, judgment etc. all these unsafe behaviours can hinder judgment and other mental processes, body fatigue leading to reduce efficiency of the individual worker towards safety. Other personality factors include age, lack of knowledge, experience, skills, ill-health and physical unsuitability of the worker such as visual or hearing impairment, epilepsy, unfriendliness with co-workers or employers, emotional problem like fear, inability to follow instructions and concentration (Achalu, 2000).

These are conditions of the work environment that can precipitate accident to workers. They include nature and man-made factors. Nature factors include those factors that can obscure visibility such as: rain, dust, smoke, wind, sunlight, foreign body in the eyes, others include floods, tornados, earthquakes, land slide, extreme temperatures, and inadequate ventilation. Man-made factors that cause accidents include: filthy environment, slippery floors, improper storage of items, faulty machine use of generators, candles, insecticides, and pesticides. Other predisposing factors to

accident include; bad lifting technique causing spinal injuries; assaults in work site, direct explosion on the unit, carbon monoxide from combusting fuel, wood oil, vehicles, generators, and faulty electrical appliances. These affect workers' health and caused fatal injuries in production line in industry if not prevented (Achalu, 2000).

In Nigeria, the Labour, Safety, Health and Welfare Bill of 2012 empowers the National Council for Occupational Safety and Health to: enforce and implement OSH measures in the workplace; promote the protection of lives & properties; promote OSH awareness; carry out inspection of the workplaces and monitor the compliance of all regulations or other OSH measures enshrined in the Bill. Correspondingly, the Nigerian Social Insurance Trust Fund (NSITF) management board implements the Employee's Compensation Act of 2011, which makes provisions for compensation for any death, injuries, and diseases or disabilities due to employment.

In the mean time, the Factories Act Cap 126, laws of the federation of Nigeria 1990 enables the Inspectorate department of the Federal Ministry of Labour and Productivity to enforce the minimum standard requirements of the Factories Act of 1990 in Nigeria. The enforcement processes require issuing of warning or notices to offenders, after which the lower level of enforcement, which includes the sealing of a defaulting factory, takes place (Okojie, 2010). Regrettably, this is not practicable in Nigeria in that the resources required are under estimated and not made available. In affirmation, Okojie (2010) reports that the sealing of premises, which is a form of enforcement rarely happens in Nigeria. The argument therefore is that there should be daily inspection of workplaces by the factory inspectors and monthly reports to the Federal Ministry of Labour and Productivity (Okojie, 2010), but this is farfetched. Moreover, Ezenwa (1997) in Ezenwa (2001) found that the annual average of factory inspectors from 1987 to 1994 is 55.75 (where the annual average of registered

factories in Nigeria from 1987 to 1994 is 4923), and Okojie (2010) states that there are only 60 factory inspectors in Nigeria. These create room for pondering as to why more enforcement officers cannot be employed. Nigeria is the most populous country in Africa with a population of over 165 million, so 60 inspection officers are far too few to enforce the OSH regulations in Nigeria. It is therefore not misleading to assert that lack of personnel power and commitment to ensuring better enforcement in the part of the enforcement authorities hinder optimum enforcement of OSH regulations.

Equally important, a study by Diugwu et al. (2012) shows that majority of construction workers in Minna, Nigeria (if not in the whole country) are not aware of the body responsible for enforcing OSH regulations in the industry. In the study, about 79.5 percent of the respondents could not identify the correct body responsible for OSH enforcement in Nigeria. This suggests lack of knowledge as per OSH and its ineffective enforcement that contradict best practices of safety management in developed countries..

**Table 2.3.1:** Number and rate of fatal injuries to workers.

| **Year** | **Employees (per 100,000)** | | **Self-employed (per 100,000** | | **Workers (per 100,000)** | |
|---|---|---|---|---|---|---|
| | **Number** | **Rate (a)** | **Number** | **Rate (b)** | **Number** | **Rate (c)** |
| 2009/10 | 104 | 0.42 | 43 | 1.05 | 147 | 0.50 |
| 2010/11 | 122 | 0.49 | 53 | 1.26 | 175 | 0.60 |
| 2011/12 | 114 | 0.46 | 57 | 1.32 | 171 | 0.58 |
| 2012/13r | 99 | 0.39 | 51 | 1.14 | 150 | 0.51 |
| 2013/14p | 89 | 0.35 | 44 | 0.96 | 133 | 0.44 |
| Five year average 2008/09-2012/13r | 133 | 0.45 | 51 | 1.21 | 164 | 0.56 |

**Source**: RIDDOR, 2014. (Health and Safety Statistics for Great Britain 2013/14).

(**Note:** r=revised, p=provisional)

Table 2.3.1 above shows that there were 133 workers fatally injured in 2013/14 (provisional), equivalent to a rate of fatal injury of 0.44 per 100,000 workers. The rate for 2013/14 compares to an average rate of 0.56 for the previous five years. Due to the fluctuation of recent years, it is currently too early to confirm a further sustained improvement in fatality rate (Reporting of Injuries, Disease & Dangerous Occurrence Regulation [RIDDOR], 2014).

Considering the fact that Nigeria is a developing nation with decaying infrastructure and institutions, we cannot isolate safety standards from working environment. Industrial safety in Nigeria, though not a nouvelle concept is still evolving and can be argued to be in the formative stage. This is so because there is no current national legislation that mandates stakeholders and regulators alike. Without strict regulations, industrial safety is still assumed to be a good practice by most employers and businesses and little or no attention is paid to it except few multinationals that have to adopt world best practices.

Accidents and incidents are not synonymous with Nigeria. Everywhere in the world from a minor leg break from tripping over a cord in the office to an oil rig explosion, accidents happen, though they may vary in magnitude and consequence. Accidents and incidents can never be completely eradicated but as with the logic and intent of health and safety, it can be reduced to the barest minimum or for want of a better phrase, reduced to acceptable levels.

The closest thing to a national law is the factories act of 1987 and the cap 126 in 1990 and the recent factories act of 2004 which is not accessible to most stakeholders. Most factories still operate on the 1990 factories act. This act refers to factories alone but as seen everywhere in the world, health and safety laws should go beyond just factories. This view is shared by most stakeholders and in fairness this

write up has to mention the recently passed Labour, welfare and safety bill 2012 by the Nigerian senate most recently. When this is signed into law then we can truly say health and safety has taken off in Nigeria (Okolie and Okoye, 2012).

The factories act of 1990 entrusts the regulation and enforcement of health and safety on the Ministry of labour and productivity and specifically its inspectorate division. Statistics obtained showed that for all the 5888 factories registered as at 2006 there were only 39 inspectors and more alarmingly the South South region of the country with 524 registered factories have only 2 inspectors to cover them all. This shows a lack of manpower to handle the challenges and not to forget, this only pertains to factories without considering other places of work. The skill level of inspectors is another cause for worry as most are not abreast with current trends in health and safety (Diugwu *et al.*, 2012).

**b. Occupational Health Problems in Industry**

Workers in industries do face numerous occupational health problems resulted from industrial accidents. Such problems seriously affect their productivity and life span. The main problems include: Problem of social and environmental pollution, air pollution, noise pollution, ergonomic and chemical pollution.

Social and environmental pose great health problems in workplace. The increase in migration of both skilled and unskilled workers from rural to urban centres causing overcrowding and environmental pollution. The migration results in unemployment, poverty, lower standard of living, delinquent behaviour such as abuse of drugs and alcohol, prostitution, robbery, and psychological problems among others. These outcomes bring about stress, anxiety and their implications. Apart from environmental pollution, there is problem of poor housing, overcrowding, poor working conditions and malnutrition.

Air pollution is a serious health problem in industry. Apart from contamination of air and the entire environment through automobile and industrial fumes, it introduces harmful pollutants from the exhaust of internal combustion and diesel engines. The pollutants affect the entire body organs and cells causing such risk conditions as cancer, degenerative and chronic diseases including irritation of respiratory and cardiac problems, loss of visibility leading to accidents (Achalu, 2000). Air pollution also affects the plant growth negatively resulting in poor food production and nutritional problems such as malnutrition and anaemia that result to morbidity and mortality.

Noise is a form of energy that is transmitted through the air as waves with varying pressure (Achalu, 2000, p. 28). Noise is measured in decibels. The lowest sound, the human detects is one decibel and the highest is 150 decibel which is damaging to the ear. Example of industries that can produce loud noise include: automobiles, milling/grinding machines, panel beating workshops, stereo equipment workshops, generator producing industries and many others. These industries produce serious health problems which are often neglected. Problems from the noise include poor hearing, loss of concentration, irritation, fatigue, restlessness and in serious cases loss of hearing. Chemicals used in industrial plant operations can act as poisons to cause harm to the skin. Chemical chronic poisoning can occur as a result of workers improperly handling materials in routine operations without protective measures.

Other personality factors include age, lack of knowledge, experience, skills, ill-health and physical unsuitability of the worker such as visual or hearing impairment, epilepsy, unfriendliness with co-workers or employers, emotional problem like fear, inability to follow instructions and concentration (Achalu, 2000).

**Table 2.3.2:** Estimated total and new cases of self-reported work-related illnesses by type of illness, for the people working in the last 12 months

| Illness | Year | Total number of cases of work-related illnesses in the last 12 months (Thousands) | | | New cases of work-related illnesses in the last 12 months (Thousands) | | |
|---|---|---|---|---|---|---|---|
| | | Central | 95% Confidence Interval | | Central | 95% Confidence Interval | |
| | | | Lower | Upper | | Lower | Upper |
| All illnesses | 2008/09 | 1179 | 1124 | 1234 | 549 | 511 | 586 |
| | 2009/10 | 1265 | 1206 | 1324 | 554 | 515 | 593 |
| | 2010/11 | 1152 | 1092 | 1211 | 495 | 455 | 534 |
| | 2011/12 | 1073 | 1017 | 1129 | 452 | 416 | 489 |
| | 2013/14 | 1241 | 1179 | 1303 | 535 | 494 | 576 |
| Musculo-Skeletal disorders | 2008/09 | 536 | 500 | 573 | 191 | 169 | 212 |
| | 2009/10 | 572 | 532 | 612 | 190 | 166 | 214 |
| | 2010/11 | 508 | 469 | 548 | 158 | 135 | 180 |
| | 2011/12 | 439 | 404 | 474 | 141 | 120 | 161 |
| | 2013/14 | 526 | 486 | 565 | 184 | 160 | 208 |
| Stresses, depression or anxiety | 2008/09 | 414 | 382 | 446 | 229 | 205 | 254 |
| | 2009/10 | 435 | 401 | 468 | 233 | 209 | 258 |
| | 2010/11 | 400 | 365 | 435 | 211 | 186 | 237 |
| | 2011/12 | 428 | 593 | 464 | 221 | 196 | 246 |
| | 2013/14 | 487 | 448 | 525 | 244 | 216 | 271 |

**Source**: Labour Force Survey: Health and Safety Statistics for Great Britain 2013/14.
**Note:** No ill health data was collected in 2012/13.

Table 2.3.2 above revealed that new cases of ill health have generally fallen since 2001/02, reaching a low of 452,000 in 2011/12. No ill health data was collected in 2012/13, but in 2013/14 the number of new cases increased to 535,000, a similar level to that in 2009/10. The estimated number of new cases of stress, depression or anxiety has remained broadly flat for more than a decade, with estimate of 244,000 in the latest year. For musculoskeletal disorders, the estimated number of new cases fell from 216,000 in 2001/02 to 141,000 in 2011/12, but increased to 184,000 in 2013/14 (LFS, 2014).

All accidents are caused. They are the result of human error, and they involve unsafe behaviour or an unsafe condition, or a combination of both. Process improvement opportunities are always identified following an accident, and prompt

corrective measures are scheduled. Unfortunately, the inherent ability of the environment or behaviour that initially caused the accident is seldom addressed in its entirety. Thus, we wait for the next accident in order to identify the next required preventive measures.

### 2.3.2 Attitude of workers towards industrial safety

The human element of occupational health and safety is an extremely popular topic at national and regional safety conferences. Safety leaders realize that reducing industrial accidents to below current levels require increased attention to human factors. Engineering interventions and government policies have made their mark. Now it is time to include a focus on the human dynamics of injury prevention. Most attempts to deal with the human aspects of safety have been limited in scope. Many trainers and consultants claim to have answers to the human side of safety. But their solutions are too often impractical, shortsighted, or illusory. And to support their particular programme, consultants, authors, and conference speakers often give unfair and inaccurate criticism of alternative methods (Geller, 1997).

Simply put, behavioural science principles provide the basic tools and procedures for building an improved safety system. But the people in a work culture need to accept and use it these behaviour based techniques appropriately. This is where a broader perspective is needed, including insight regarding more subjective concepts like attitude, value, and thought processes. Recall that psychology includes the scientific study of both mind and behaviour. Therefore, a practical book on the psychology of safety needs to teach science-based and feasible approaches to change what people think (attitude) and do (behaviour) in order to achieve a Total Safety Culture (Geller, 2001).

Before the 1930's safety specialists followed the prevention approaches by using physical methods such as machine guarding, housekeeping and inspection programs. Until that time, it was believed that the main causes of industrial accidents were unsafe conditions and physical hazards such as heavy equipment, trenches, mechanical explosions, ionizing radiation, flammability, corrosion, reactivity, fast moving vehicles, steep grades, uneven surfaces etc. It was in the early years of 1930's when the concept of unsafe acts and their role in causing industrial accidents were introduced and the theory of "human beings as the first antecedents (trigger reason) of accidents by doing unsafe acts" was propounded by Heinrich in his book "prevention of industrial accidents". Heinrich stated that roughly 88% of all accidents were caused by human errors. This drew psychologists and safety specialists' attention to unsafe acts as the most probable cause of frequent accidents happening in industries (Heinrich, 1941).

As mentioned earlier, Heinrich, an early pioneer of accident prevention brought a theory indicating that the most important factor of industrial accidents is unsafe behaviour. He suggests that for every three hundred and thirty (330) unsafe acts, twenty nine (29) will result in minor injuries and one in a major or lost time incident; on the whole 90 percent causes of workplaces are human error. He further emphasized that all health and safety measures may fail if workers do not have the right knowledge, attitude and behaviour towards health and safety of the workplace. Organizations looking for ways to improve workplace safety can start by evaluating the attitude their employees bring to the job each day. A positive or negative attitude affects how workers approach their jobs, and attitudes can have a ripple effect on those around them. In general, a positive attitude will have a positive impact on productivity, while the reverse is also true. Work environments can change frequently

as companies update work procedures, introduce improved technology and add new products and customers. Employees who display a positive attitude toward change may welcome and even embrace it, as they may view it as a chance to enhance their skills. As a result, they may adapt to change more quickly than an employee with a negative attitude, reducing the time it takes to implement change in a productive manner.

Synergy Safety Solution psychologist and managing director Rose Reilly has significant experience with the impact of negative safety attitude on behaviour at work. She said a negative attitude towards safety could stem from a number of factors, including complacency, peer influence, time and production pressures and a belief that “it will not happen to me”. One aspect employers have not been able to control is the attitude of their workers towards safety. A negative attitude towards safety can lead to high risk behaviour, such as disregarding rules or taking shortcuts. Even the strongest safety culture will fall down when presented to employees who are more concerned with finishing the job fast without compliance to the safety rule. (Rose Reilly, 2000).

An employee's attitude has an impact on how he functions as part of a team. For instance, as many companies attempt to create a more diverse workplace, employees may need to work with people of a different race, nationality or gender than they have in the past. Employees who embrace these diverse workers and are willing to assimilate them into their team can foster a spirit of cooperation, making the team more productive in the process. Workplace attitude can affect the presence of innovation and creativity, which can lead to increased productivity. Workers with a positive attitude toward their job and the company are more likely to make helpful suggestions or ideas that help the business grow. On the other hand, workers with a

negative attitude may only be concerned with producing enough to get by while having little interest in innovation (Gadd and Collins, 2002)..

Most attempts to create attitudinal-driven safety in industry usually hinge upon the belief that safety culture determine behaviour (Indeed, this is a very common opinion amongst many safety professionals). Remedies tend to rely on publicity campaigns and safety training to bring about changes in people's attitudes towards safety, which in turn is expected to change people's behaviour. Although positive safety attitudes are important and very desirable, the link from attitude change towards safety culture is very weak. This can be explained by the fact that a single attitude comprises of at least three components: thinking (cognitive), feeling (emotional), and the intention to act on it (commitment). Additionally, a single attitude is usually linked with a set of other related attitudes. Logic dictates, therefore, that attempts at attitude change must target each individual component of each individual attitude, for each single employee (Glendon *eta l.*, 2006).

Fortunately, the link from behaviour change to safety culture is much stronger if people consciously change their behaviour, and also tend to re-adjust their associated safety culture to fit the new behaviour in workplace. This occurs because people try to reduce any tension caused by a mismatch between their behaviour and safety attitudes in workplace. Behaviour change, therefore, tends to lead to new belief of safety culture that buttress the new set of behaviours required in workplace. (Cooper and Phillips, 2004).

Psychologists have known for some time that group membership demands conformity to the groups' behavioural and attitudinal 'norms'. If a workgroup adopts the 'norm' that 'thinking and behaving safely' is best for all concerned, the group as a

whole will tend to apply social 'sanctions' to the individual who deviates from this norm and behaves unsafely. If people wish to remain a part of the social fabric of the workgroup, they soon revert back to the safety norm and behave safely. Importantly, this illustrates the point that workgroups will adopt a collective definition of those behaviours, work practices or tasks that are considered to be risky (Cooper, 1997). This fact lies at the very heart of behavioural safety, simply because its essence is to help workgroups positively redefine their own safety related norms.

A focus upon unsafe behaviours also provides a much better index of ongoing safety performance than accident rates for two reasons: First, accidents are the end result of a causal sequence that is usually triggered by an unsafe behaviour; And second, unsafe behaviors can be measured in a meaningful way on a daily basis. Accident rates tend to be used as the primary outcome measure of safety performance simply because they signal that something is wrong within the company's safety management system. Because of the way they are calculated, they also provide a crude benchmark by which companies can compare the effectiveness of their safety management systems across industries. Unfortunately, this tends to result in management attention and resources being focused on safety only when accident rates rise dramatically. When the immediate problems appear to be resolved, management attention and resources are diverted to other pressing organizational issues until such time as the accident rate rises once again, and so on.

Consequently, rather than being proactive, those who focus almost exclusively on accident rates as a measure of safety performance tend to be reactive in their approach to safety. Conversely, a regular focus on actual safety behaviour is proactive as it allows other safety-related issues in the accident causal chain to be identified and

dealt with before an incident occurs. Because 'safety behavior' is the unit of measurement, a collaborative, problem-solving approach involving both management and employees is adopted to identify critical sets of safe and unsafe behaviours and used to develop 'Safety Behaviour Inventories' (See Cooper, 1998). These inventories provide the basis for personnel to systematically monitor and observe their colleague's ongoing safety behaviour, on a daily basis, in an enabling atmosphere. Based on the first few weeks' results of the peer monitoring, the workforce set their own 'safety improvement' targets. Information feedback is then provided on a weekly basis to allow the workgroups to track their progress in reaching the safety improvement targets. Companies adopting this approach are usually rewarded by fewer accidents, consistent safety management, better communications and greater involvement in team working, all of which can exert beneficial effects on production related issues and bottom line profits.

### 2.3.3 Accidents preventive measures in industry

To prevent the devastating impact of workplace accidents, it is crucial to consider preventative measures on a number of levels. Firstly, environmental factors must be considered. This includes such measures as protective guards for machinery, protective clothing and the removal of hazards. This level of prevention is aimed towards the creation of a safe physical environment, and plays an important role in the removal of opportunity for injury or harm. Secondly, companies must address safety issues through the implementation of a strong safety policy. This refers to putting rules in place regarding such things as the reporting of hazards or the handling of dangerous materials. The final strategy for the prevention of workplace accidents involves human resource management. This involves making effective recruitment and retention decisions in order to manage risks and control costs by screening out

individuals who are most likely to exhibit unsafe behaviour in the workplace. This enables the organisation to create a safer work environment, and is more productive and efficient (Clarke, 2006).

The industrial regulations and mechanism for enforcement are in place in United States (US), but the agencies charged with administering safety regulations are generally understaffed with tens of thousands of covered employers and only 1100 inspectors, the task is clearly a challenge for the agency. In addition, certain categories of workers, such as some federal, state, and municipal employees, do their jobs without protection from Occupational Safety and Health Administration (OSHA) or any government agency. Most federal and state municipal employees are excluded from OSHA regulations. Continued reduction of accidents in the US will require an increased in initiative on the parts of all parties involved to include employers, employees, and federal and state government. An understanding of the issues of today will be enhanced by a review of the past (Mark and James, 2010).

Industrialization in many rapidly developing countries brings with it radical alterations in the life of these countries but well designed and appropriate safety measures are not adopted, these pose serious adverse health consequences and industrial accidents to the workforce. The success of any occupation is measured by the progress made and the safety of its workers. The need for the employees' safety from the occupational hazards is highly commendable. Every worker expects to live longer and so needs to be free from all hazards including accidents that can limit or threaten their survival and that of their families. The most common of such hazards is accident. They need to be safe and secure in relation to himself, his family and his work so that their health will be prolonged and work output increased thereby promoting the growth of the industry. Nevertheless, accidents occur and constitute the

most important threat to survival of workers. Occupational injuries do create serious health problems for the working population. They are costly, not only in terms of health and personal loss but also in loss of productivity. There is need to discuss preventive measures and how those affected can be effectively managed and then rehabilitated back to their occupation (Achalu, 2003).

Since some nature of industrial accidents are known and documented while some are largely unknown, there is need to attempt to identify the unfamiliar and unknown hazards in the work places in order to control them. The methods of detection put forward by Asogwa (2007) included: biological monitoring, epidemiological methods, and environmental measurements. These detectives agents help in identify appropriate industrial accident preventive measures.

**a. Prevention and Control of Industrial Accident**

The understanding of the causes of accidents and how the employee is affected within working environment is beneficial in prevention and control of industrial accidents. Literature abounds on the preventive measures. The following measures could be applied as suggested by Achalu (2000):

- Provision of safe premises, safe procedures, safe machines for workers by the employers.
- Provide workers with adequate training on the importance and proper use of safety devices such as eye goggle, booths, ear plugs, hoes, cutlasses, hand gloves, face mask as the case may be according to factory rules.
- Pre-employment and periodic examination of all employees should be ensured. This is to evaluate the health and fitness status of the employees before employment as a baseline data and also to determine what becomes of the workers' health with time due to the nature of work done.

- Provide workers with information regarding the inherent risks of any occupation before he/she is allowed to work alone on the job.
- Protective clothing should be properly designed according to the anthropometric measurement of the workers to avoid discomfort while performing tasks. This, according to Asogwa (2007) will discourage unwillingness of the workers to use the clothing properly or even do without it claiming that it is uncomfortable and makes him clumsy. Workers should also be motivated to use the clothing for safety measures. Hazards and consequences of negligence, according to Asogwa, should be made as concrete as possible through real life case studies and factual material drawn from work situations in which the people are employed.
- Effective training and encouragement of workers on proper use of safety knowledge, skill and various work procedures.
- There should be well defined policy guidelines on safety precautions in each plant.
- All aspects of the factory should be adequately ventilated to avoid excessive heat or humidity.
- Avoid pouring water, oil or other chemicals that can make the work environment slippery to cause accident.
- Prepare and display at strategic positions within the work environment bill boards, posters, sign posters indicating danger zones, safety measures, unsafe danger zones, safety measures, unsafe acts in work place, the need for compliance and disciplinary measures.
- Inculcation of personal hygiene and provision of facilities for conveniences.

- All defective machines and equipment should be repaired or replaced to avoid accidents. Modification in the use of dangerous machinery and hazardous operations should be adhered to.
- The use of worn-out hand tools, e.g., hammers, Chisel should be discouraged. Proper design and shielding of all machinery with efficient interlocks may eliminate completely the risk of damage to the worker from splashing chemicals or damage from flying objects thereby avoiding accidents.
- Studying the biomechanics of human gait to determine forces and torques acting at the interface between the floor and the sole of the shoe can assist to improve friction characteristics of floor surfaces and shoe soles to reduce accident risks as a result of falls.
- Workers' metabolic demands for a job done in hot and humid environments should be evaluated to recommend a work-rest regime that will prevent heat stress. Recreational facilities and canteen for feeding should be provided. There are little emphases on attitudinal dimension of accident preventive measures (Asogwa, 2007).

### 2.3.4 Socio-cultural factors towards industrial safety

Societies in which we live and grow up have their own sets of rules about the way we behave and interact with others. These rules or norms are not written down, and often, we are not even conscious of them. Such rules or norms which enable societies to act accordingly within their own environment, are collectively called culture (Hofstede, 1990).

The role of a well-articulated and properly communicated socio-cultural impediment towards industrial safety cannot over be emphasized especially in industrial accident preventive measures. Industrial safety is directly influenced by individual

perception and/or attitude towards risk which is impacted by differences in language and culture.

Many of the key determinants that will affect these workers levels of safety awareness and behaviours may be impacted by various cultural barriers to safety. One of the most obvious barriers is the language barrier between Latino and non-Latino construction workers. To effectively integrate Latino workers into the U.S. construction workforce an understanding of the communication process and the role of language barriers to communication must be developed, along with identifying the consequences of communication failures (Cooper, 2000). According to the National Safety Council's 2003 Salary Survey, few Latinos speak English when they enter the U.S. and more than 71 percent of companies employ workers whose native language is not English or who do not speak English.

Latino Immigrants and Spanish-speaking workers often receive less job safety and health training because they do not speak English well or even at all (Ruttenberg, 2004). One Latino worker in a survey by the Centre for Construction Research and Training (CPWR) said that people appear to be less willing to explain things to those with limited English, and foremen get frustrated trying to explain to workers how to do a task safely. To further complicate the situation, the construction industry uses very technical terms, and even Latino workers with Basic English skills find it difficult to communicate (Ruttenberg, 2004).

Another communication barrier similar to language is literacy. In 2010 the Morrison Institute reported that the typical Mexican immigrant has completed less than nine years of education and only about half of the Latinos in the western United States possess a high-school education (Vazquez, 2004). The US Census Bureau conducted a similar study and found that 27.3 percent of adult Latinos have less than a

ninth-grade education (Vazquez, 2004). High illiteracy rates combined with an inability to linguistically communicate can compromise the safety of both Latinos and English-speaking construction workers on the jobsite (Vazquez, 2004). For Latinos, learning opportunities such as work briefings, safety meetings, and workerto- worker observation and discussion that help supplement formal classroom training are not as beneficial or effective when the knowledgeable and experienced construction workers and managers speak English only (Vazquez, 2004).

Between 1996 and 2001 the Census of Fatal Occupational Injury reported that the excess rate of fatal injury occurred more prevalently among foreign-born Latino workers, while U.S.- born Latino workers had fatal injury rates similar to the rest of the U.S. workforce (Vazquez, 2004). This had led many researchers to believe there is another barrier preventing Latino workers from achieving a high level of safety within the construction industry. When Latino workers immigrate to the U.S. they bring with them varied histories, cultural sensibilities, strong health beliefs, and a different cultural background compared with non-Latino workers. Some Latino culture and values can present challenges and lead to safety problems on the jobsite.

In a report on Latino Workers in the Construction Industry, Fernando Vázquez (2004) outlines the unique culture and values exhibited in the Latino community. Latino culture teaches that authoritative figures are to be shown ultimate respect which leads to Latino's rarely disagreeing with supervisors or foreman even when those authoritative figures are wrong. This cultural value of respect will also hinder Latinos from asking questions or challenging instructions delivered by supervisors. Latinos also culturally tend to do as they are told, regardless of whether they understand. The response stems from the large locus of control distance characterized

in the Latino Culture where workers are accustomed to organizations that exhibit centralization of power and subordinates do as they are told (Cooper, 2000).

Latino culture teaches them to remain silent rather than confront problems. To complicate the issue, illegal immigrants fear the possibility of deportation which reduces the likelihood of reporting safety problems. Latinos place high value on family which often extends beyond primary family members. At the workplace Latinos will often speak with each other and create close relationships but will be reluctant to discuss issues with non-Latinos or supervisors. Developing trust in the Latino culture requires time to form personal relationships. With the nature of construction and the constant moving around job sites and relocation, Latinos are unlikely to develop those relationships with supervisors therefore never truly establishing trust between one another (Vazquez, 2004).

For Latino men, the idea of machismo has a significant impact on job site safety. Machismo is strong in Latino culture and refers to a standard of behaviour exhibited by men. Machismo is the masculine force, which to one degree or another drives all masculine behaviour both positive and negative. In a study by Nancy Menzel and Antonio Gutierrez (2010), participants from focus groups stated that machismo plays a role in the higher injury rates suffered by Latinos because it discourages Latino workers from wearing safety equipment. With an increasing mixture of different nationalities and ethnic groups who understand behaviours in different ways set by cultural knowledge and conventions, it is important for a better understanding of cross-cultural management.

The CPWR conducted a survey and collected responses from Latinos with construction experience outside the United States. All responses expressed difficulty in adjusting to construction work within the U.S. and show the differences in cultural

understanding across varying backgrounds. A Cuban said that in his home country safety equipment was difficult to get and safety regulations were never of any use. A roofer born in Mexico stated he had never used personal protective equipment and was unaware of the importance of safety. He also stated he used to work with cement in his bare feet which is caustic. A Columbian electrician stated in Colombia the focus is on production and there are few safety regulations (Ruttenberg, 2004).

Many developing countries have health and safety legislations in place to protect workers but experience difficulties in implementing the legislation due to a lack of mechanisms for enforcing it within cultural context (Cotton *et al.,* 2005; Khein *et al.,* 2008). Ghana is no exception; as Khein et al. (2006) note there are several issues with Ghana's health and safety legislation including a lack of financial and administrative resources, unreported accident statistics and problems enforcing legislation due to a limited scope of Occupation Health and Safety Act (OHSA) on local community projects.

Khein et al. (2010) note importance of local law for maintaining traditional values and ensuring they are enforced in society. While national laws may not protect individual worker on community projects in developing countries, traditional governance and local customary law may be of great relevance. Of particular significance to community project is the existence of Communal Labour Laws, which require community members to participate in work for communal benefit, which are enforced at the local level by traditional chiefs and elders (Ubink, 2008).

Geert Hofstede's cultural dimensions are useful for gaining a snap shot picture of some general attributes of nation's culture and its influence on industrial safety regulations. He identified four dimensions along which cultures could be characterized and compared on national level (Hofstede, 1980). These were 'Power

Distance Index', 'Individualism verses Collectivism', 'Masculinity verses Feminity' and 'Uncertainty Avoidance Index' (ibid.). A fifth dimension was later added, 'Long-term Orientation' (Hofstede, 1991) and most recently a sixth, 'Indulgence verses Restraint' (Hofstede *et al.*, 2010). Many authors have found Hofstede's framework to be a constructive means by which to structure exploration of the links between national culture and health and safety culture.

Khein et al. (2007) provide an example from Ghana, a strongly collectivist culture, where it was found that extended family social structures and collectivist values provide opportunities for health and safety management in working environment. In Ghanaian extended family, the head of the family has responsibilities to provide for and set a good example to the rest of the family-in the same way, the head of an organization should have responsibilities for the health and safety of his workers. The local context provided an opportunity for health and safety procedures to be understood and incorporated into daily work.

In summary, all the literatures reviewed are geared towards appropriate approaches of reducing industrial accidents either collectively or individually. But some safety experts are not satisfied with the safety culture approaches. For instance, Baarts (2009), notes that both collectivism and individualism can have negative consequences for overall safety of a group. Strong collectivism can lead to unwillingness to challenge a dangerous behaviour; while strong individualism can lead to a failure of other individual workers safety culture at workplace and of what importance are safety regulations in enforcing socio-cultural background of the employees? Behavioural approaches to safety management have thus acquired increasing popularity in recent years. However, the implementation and sustainability of such programmes and policies had been varies and many successful programmes

that have reportedly improved health and safety performance have seemingly lost momentum (HSE, 2002).

The above criticism on various approaches towards industrial safety has shown more of established gap intended to be filled in this study.

## 2.4 Theoretical Framework

Several safety experts and authors note that theories of accident causation have evolved systematically over the years. For example, the first stage of scientific theorizing about the causes of accidents is commonly referred to as the technical period, during which development in new mechanical systems were rapid and most accident were viewed as being caused by mechanical malfunctions, particularly in the structural integrity and reliability of equipments (Heinrich, 1941).

Recent years have witnessed the development of second stage which is known as the period of human error, where limitation of the human operator rather than catastrophic mechanical malfunctions were identify as the source of system breakdowns, shifting the attention of safety analyses from mechanical aspects to the person directly involved in committing the error. This justified why researcher adopted Domino Theory and highlighted upon Human Factors Theory of Accident Causation to support our understanding of workers attitudes as a measure of reducing alarming rate of industrial accidents towards sustaining a healthy and safe working environment in Nigerian industries, and Kaduna Industrial Area in particular.

### 2.4.1 Domino theory

Herbert W. Heinrich (1941), an early pioneer of accident prevention and industrial safety developed Domino Theory in the late 1920s, after studying the report of 75,000 industrial accidents, Heinrich concluded that;

- 88 percent of industrial accidents are caused by unsafe acts committed by fellow workers.
- 10 percent of industrial accidents are caused by unsafe conditions
- 2 percent of industrial accidents are unavoidable.

### 2.4.2 The basic principles of Heinrich's domino theory

In a row of dominoes, tipped the first one over and watched as each successive domino topples the one next to it signify how Heinrich's Theory of accident works. According to Heinrich, there are five factors in the sequence of events leading up to an accident. These factors are summarized as follows:

i. Ancestry and social environment: Negative character traits that may lead people to behave in an unsafe manner can be (ancestry) or acquired as a result of social environment.

ii. Fault person: Negative characters trait, whether inherited or acquired, are why people behave in an unsafe manner and why hazardous conditions exist.

iii. Unsafe act/mechanical or physical hazard: Unsafe acts committed by people and mechanical or physical hazards are the direct causes of accidents.

iv. Accident: Typically, accidents that result in injury are caused by falling or being hit by moving objects.

v. Injury: Typical injury resulting from accident includes lacerations and fractures.

Above tenets show that Heinrich's Theory has two central points; injuries are caused by the action of preceding factors, and removal of the central factor (unsafe

act/hazardous condition) negates the action of the preceding factors and, in doing so, prevents accidents and injuries**.**

### 2.4.3 Applications of domino theory on workers' attitudinal dimension

The tenets of Heinrich's Domino theory are centered on attitudinal related factors that cause industrial accident. The theory materializes in many different situations that characterized with attitudinal dimension of industrial accident. In related to this study, attitude of workers towards safety at workplace is determined by the level of worker's right attitude (human factor) on the job. Workplace is bounded with safe/unsafe acts that shaped workers' attitude, behaviour, and perception that are largely shared among the entire workers in workplace.

Industrial accident occurs through what Heinrich termed 'dominoes tipples'. Where the first domino tipped will determine outcome of each successive domino. To observe this, Heinrich's five sequential factors leading to an accident serve as a tool used by the management or supervisors for anticipating when and where accident is likely to happen. For instance, individual manager who wanted to know the level of failure to comply with the usage of Personal Protective Equipment (PPE) should first systematically ascertain whether it is agree with worker's ancestry or social environment. Whatever meanings he derived from such investigation serve as measure to shape workers' attitude, knowledge and perception towards safety precautions at workplace.

Going by the second domino effect of fault persons, the negative personality trait he/she exhibited, whether inherited or acquired translate into unsafe manner that lead to work related accident. Therefore, Domino theory is adopted in this study to support the attitudinal-related factors leading to industrial accidents in workplace.

## 2.5 Human Factors Theory

The human factors theory of accident causation attributes accidents to a chain of events ultimately caused by human error. It consists of the following three broad factors that lead to human error: overload, inappropriate response, and inappropriate activities.

### i Overload

Overload amounts to an imbalance between a person's capacity at any given time and the load that person is carrying in a given state. A person's capacity is the product of such factors as his or her natural ability, training, state of mind, fatigue, stress, and physical condition. The load that a person is carrying consists of tasks for which he or she is responsible and added burdens resulting from environmental factors (noise, distractions, and so on), internal factors (personal problems, emotional stress, and worry), and situational factors (level of risk, unclear instructions, and so on). The state in which a person is acting is the product of his or her motivational and arousal levels.

### ii Inappropriate Response and Incompatibility

How a person responds in a given situation can cause or prevent an accident. If a person detects a hazardous condition but does nothing to correct it, he or she has responded inappropriately. If a person removes a safeguard from a machine in an effort to increase output, he or she has responded inappropriately. If a person disregards an established safety procedure, he or she has responded inappropriately. Such responses can lead to accidents. In addition to inappropriate responses, this component includes workstation incompatibility. The incompatibility of a person's workstation with regard to size, force, reach, feel, and similar factors can lead to accidents and injuries.

### iii Inappropriate Activities

Human error can be the result of inappropriate activities. An example of an inappropriate activity is a person who undertakes a task that he or she does not know how to do. Another example is a person who misjudges the degree of risk involved in a given task and proceeds based on that misjudgement. Such inappropriate activities can lead to accidents and injuries.

## 2.5.1 Application of Human Factors Theory

In the category of overload, this is applicable when there is speed up in the production process beyond the machine limits in some cases, and beyond the employees' capabilities in others triggers poor attitudes towards safety. Similarly, stress, insufficient training of new employees, and fatigue all contributed to the overload that leads to unanticipated accident. In the category of inappropriate response, when employee neglect safety procedures to save time or speed up production, it amounted to poor attitude towards safety. In the category of inappropriate activities, it is applicable when safety manager or supervisor discovered that new employees are being assigned duties for which they are not yet fully trained. As a result, they often misjudged the amount of risk associated with their work tasks.

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Introduction

In this study, attempt is made to give a description of the procedures used in conducting this research. Description of location of study, population, sampling procedure, sampling size, administration of research instrument and methods used for analyzing the data collection are all highlighted. Explanation on each method is given to its relationship with objective of study and statement of problem to enhance logical and systematic presentation of findings.

## 3.2 Description of Location of Study

Kaduna state occupies part of the central position of the Northern part of Nigeria (with Kaduna as its capital) and shares common borders with Zamfara, Katsina, Niger, Kano, Bauchi and Plateau states. To the South-West, the state shares a border with the Federal Capital Territory, Abuja. The global location of the state is between longititude of 30'' east of the Greenwich meridian and also between latitude 0900 and 11 30'' North of the equator. The state occupies an area of approximately 48,473.2 square kilometres and has a population of more than 6 million (2006 census).

History has shown that Kaduna industrial area came into existence as a result of farming activities carried out by the indigenes of the state and ex-service men who regards farming as their cultural occupation before being compelled to join military; instead of going back to their home community after retirement, they quickly went into agricultural practices on food stuff such as tomatoes, pepper, maize, groundnut, beans, vegetable and so forth, that are needed for consumption by their formal colleagues who are still in service. Later, Kaduna has been classified as state with

over 180,000tonnes of groundnut being produced annually. The major cash crop in the state has encouraged localization of several industries in this area of study.

Major industries in the state are the Federal Super Phosphate Fertilizer Company PLC, Ideal Flour Mills PLC, New Nigerian Packaging Company PLC, PAN Nigeria Limited, United Wire Products Limited, Kaduna Furniture and Carpets Company Limited, NOCACO, Queensway Aluminium Ltd, Rigid Pack Containers Limited, Zaria among several others.

This study is limited to industrial area of Kaduna metropolis located at Kakuri Industrial layout, Kaduna South, where many industries with different nature of businesses are found which helped the researcher in gathering necessary information on workers' attitude towards industrial safety as a mean of minimizing industrial accidents..

## 3.3 Population of Study

The population of study comprises of workers from selected industries at Kaduna Industrial Area, located at Kakuri, Kaduna South LGA, adjacent to Abuja Expressway, where moribund and functioning industries are found. Kaduna Industrial Area comprises of thirteen (13) operating companies namely: Peugeot Automobile Nigeria (PAN), United Nigeria Textile Company, AMECO, 7Up Bottling Company, Tower Galvanize Product (TGP), NOCACO, Kaduna Furniture and Carpet Company (KFCC), Critall-Hope Aluminum, Queensway Aluminium, Mouka Foam, Nigeria Breweries Limited, A.G. Ferrero Co. Limited and Eurofoam. Out of these companies, five (5) manufacturing companies mentioned earlier in chapter were purposively selected due to their production line that required investigation on safety management system as a measure against work related accidents and illnesses.

The total size of population (sample frame) is 768 employees (see table 3.4.1) that cut across the five selected companies proportionately. The unit of analysis was classified into five strata (sections), namely: Management/Specialists, Supervisors/Foremen, Operatives/Charge hands, Clerical/Secretarial, and Security/Cleaners. These relevant attributes have structured the study population with homogeneous outlook.

## 3.4 Sample and Sampling Procedure

According to Isangedighi et'al. (2004), one should be guided with the fact that sample size should be determined by the extent to which the sample selected reflects the characteristics of elements in the specified population. With this in mind, out of thirteen (13) operating industries located at industrial area of Kaduna metropolis, five (5) industries were purposively selected for this study after assessing their mode of operations that reflected objectives of the study as observed by the researcher during pilot study.

### 3.4.1 Determination of sample size

The sample size is determined using Conchran's sample size formula (Conchran, 1977), while data gathered during pilot study has informed the delivery rate value for the estimated population of study. The sample size formula is stated below:

Formula:N= $\frac{Z^2 P(1-P)}{E^2}$

Where N=total population

Z= statistics level of confidence ($1.96^2$)

P=estimated population parameter of permanent staff is 75% while casual staff is 25% (pilot study, 2013)

I=constant, and E=tolerable error of 5% (0.05).

$$\frac{1.96^2[0.75(1-0.25)]}{0.05^2} = \frac{3.8416[0.75(0.25)]}{0.0025} = 288.12$$

Additional four percent (4%) was added for non-response as (288+12=300). Therefore, sample size is **300** out of **768** total size of the study population.

In the course of pilot study/familiarization visit to the study area by the researcher, the following preliminary data and knowledge were gathered in determining the sample size of each selected companies proportionately as itemized below:

**Table 3.4.1:** Distribution and determination of sample size

| S/N | **Name of company** | **Staff strength** | **Sample size** | **Strata/Section** | **Sample size of Section/ Unit** |
|---|---|---|---|---|---|
| 1 | Kaduna Industrial Furniture and Carpet Company (KIFCC) | 133 | 52 | Management/specialists | 7 |
| | | | | Supervisors/Foremen | 13 |
| | | | | Operatives/Charge Hands | 25 |
| | | | | Clerical/Secretarial | 4 |
| | | | | Security/cleaners | 3 |
| 2 | Tower Galvanize Products (TGP) Company Limited | 76 | 30 | Management/specialists | 4 |
| | | | | Supervisors/Foremen | 8 |
| | | | | Operatives/Charge Hands | 15 |
| | | | | Clerical/Secretarial | 2 |
| | | | | Security/cleaners | 1 |
| 3 | Northern Cable Processing Manufacturing Company (NOCACO) | 256 | 100 | Management/specialists | 10 |
| | | | | Supervisors/Foremen | 25 |
| | | | | Operatives/Charge Hands | 51 |
| | | | | Clerical/Secretarial | 10 |
| | | | | Security/cleaners | 4 |
| 4 | Queensway Aluminum Company | 72 | 28 | Management/specialists | 4 |
| | | | | Supervisors/Foremen | 7 |
| | | | | Operatives/Charge Hands | 12 |
| | | | | Clerical/Secretarial | 3 |
| | | | | Security/cleaners | 2 |
| 5 | 7up Bottling Company | 231 | 90 | Management/specialists | 9 |
| | | | | Supervisors/Foremen | 20 |
| | | | | Operatives/Charge Hands | 45 |
| | | | | Clerical/Secretarial | 10 |
| | | | | Security/cleaners | 6 |
| | **Total** | **768** | **300** | | |

Source: Field study, 2014

Stratified random sampling is used to select sample of study population into five strata (sections), namely: Management/Specialists, Supervisors/Foremen, Operatives/Charge hands, Clerical/secretarial, and Security/Cleaners to make it homogeneous in term of relevant attributes of interest to the researcher. These strata provided a better opportunity to achieve an enhanced representative sample of various departments of study population so as to minimize sampling error. Simple random sampling is then drawn from each stratum proportionately in such a way as to obtain an overall sample of the required size.

In this method of sampling, Table of Random Number is used to obtain required sample size and assign number to all members that constitute a sample frame. After assign number to each member of the population, the next is to randomly select the starting number from the Table of Random Number through lottery on twenty (20) number of rows (x) and fifty (50) numbers of columns (y) to determine their intersection as starting number.

By going down the chosen column or along the row on the table of random number, each number that fall within the numbered digit is chosen until the required number of items (the sample size) is selected.

## 3.5 Sources of Data

Primary and Secondary sources of data are used for the study. The secondary source is obtained from the existing organizational records and data on workers attitude towards safety while primary source of data is derived directly from the respondents during fieldwork.

## 3.6 Methods of Data Collection

Researcher adopted both quantitative (survey) and qualitative (in-depth interview) methods for the study, this helped bridge the gap of the data collected and thereby enrich data for the study. Thus, quantitative data is collected through survey instrument which is questionnaire, while the qualitative data is collected through in-depth interview and observation.

### 3.6.1 Survey instrument

Questionnaire is used as a survey instrument to obtain information from respondents. It comprises of both open-ended and close ended. The open-ended questions give room for respondents to express themselves freely. The questionnaire comprises of five sections, section (A) contains demographic characteristics of the respondents, and Section (B to E) captured the objectives of study. In this regards, questionnaire (survey instrument) was designed on a five (5) point likert-type scale for 300 respondents (sample size) to measure the degree to which they agree or disagree/rate high or low where I = Strongly Agree (SA) and 5 = Strongly Disagree (SD) for Section B and E but the reverse is the case for Section D, and 1 = Very Low (VL) and 5 = Very High (VH). Interpretation of the rating scales are as follows:

| SA<br>1 | A<br>2 | UD<br>3 | D<br>4 | SD<br>5 |
|---|---|---|---|---|
| **Strongly Agree** | **Agree** | **Undecided** | **Disagree** | **Strongly Disagree** |

*see Tables 4.4 and 4.6 in page 63 and 69 respectively.

| SD<br>1 | D<br>2 | UD<br>3 | A | SA<br>5 |
|---|---|---|---|---|
| **Strongly Disagree** | **Disagree** | **Undecided** | **Agree** | **Strongly Agree** |

*see Table 4.5 in page 67.

| VL<br>1 | L<br>2 | A<br>3 | H<br>4 | VH<br>5 |
|---|---|---|---|---|
| **Very Low** | **Low** | **Average** | **High** | **Very High** |

*see Table 4.3 in page 61.

The reason behind adopting above instrument for the study is that personal face to face administration of questionnaires gives room for researcher to explain and clarify particular items in the instruments for easy administering and retrieving.

### 3.6.2 In-depth interview

An in-depth interview is a method designed to elicit a vivid picture of participant's perspective on research problems. For the purpose, an in-depth interview was carried out in each of the five selected companies with 10 key informants that comprises of management, supervisors, operatives, foremen, charge hands, chief security and cleaners. In-depth interview assisted the researcher to have an explicit understanding of the key informant's perception and attitude towards industrial safety. Observation is also used to consolidate outcomes of questionnaire and In-depth Interview and in some cases to observe safety management procedures and workers who willingly or unwillingly cannot describe adequately the safety procedures and devices in workplace.

## 3.7 Technique of Data Analysis

This is a long process which starts from sorting into categories and ends first with the presentation of a set of statistical tables accompanies by texts and commentaries. This is with a view to unearthing useful information that must have been 'buried' in the raw data. The transfer of raw data into its manageable unit is done through the following statistical procedure:

(i) Table of frequency distribution and percentage

(ii) Statistical diagram (Bar and Pie chart)

(iii) Mean Score (MS)

Mean Score (MS) formula is given as:

$$MS = \frac{\sum FX}{n}$$ Where f is frequency of responses to each rating

X is the score given to each variable, and

N is the total number of the respondents.

Pearson's correlation coefficient is adopted to show relationship between variables in an orderly and systematic presentation of numerical information into rows and columns. Its main intention is to make the physical presentation of facts such that attention of readers is automatically directed to relevant notable information.

# CHAPTER FOUR
# DATA PRESENTATION AND ANALYSIS

## 4.1 Introduction

This chapter exclusively discusses the procedures adopted to present and analyze the data collected from the field via questionnaires and interviews and then detail all the results, along with the related tables and graphs. After data cleaning has been done, the raw data gathered from field were transferred into its manageable unit for easy comprehension and interpretation as follows:

## 4.2 Socio-demographic characteristics of the respondents

The percentage distribution of respondents' background is determined to make study population homogeneous in terms of relevant attributes of the unit of analysis.

**Table 4.2:** Percentage on socio-demographic characteristics of respondents

| S/N | Variable | Frequency | Percentage |
|---|---|---|---|
| 1 | **SEX:** | | |
| | a. Male | 199 | 79.6 |
| | b. Female | 51 | 20.4 |
| | **Total:** | **250** | **100.0** |
| **2** | **AGE:** | | |
| | a. 18-23 years | 32 | 12.8 |
| | b. 24-29 years | 65 | 26.0 |
| | c. 30-34 years | 113 | 45.2 |
| | d. 35 years above | 40 | 16.0 |
| | **Total:** | **250** | **100.0** |
| **3** | **MARITAL STATUS:** | | |
| | a. Married | 114 | 45.6 |
| | b. Single | 92 | 36.8 |
| | c. Divorced | 25 | 10.0 |
| | d. Separated | 19 | 7.6 |
| | **Total:** | **250** | **100.0** |
| **4** | **HIGHEST QUALIFICATION:** | | |
| | a. Primary Certificate | 75 | 30.0 |
| | b. SSCE | 100 | 40.0 |
| | c. B.Sc/HND | 58 | 23.2 |
| | d. ND/OND | 10 | 4.0 |
| | e. Others | 7 | 2.8 |
| | **Total:** | **250** | **100.0** |

**Source:** Field Survey, 2014

As indicated on table 4.2 above, 250 copies of questionnaire were administered on demographic characteristics of respondents that cut across sex, age, marital status, highest qualification, and years of service where 79.6 percent were males and 20.4 percent were females. 12.8 percent were within the age bracket of 18 to 23 years, 26 percent were within 24 to 29 years, 45.2 percent were between age bracket of 30 to 34 years, while 16 percent are within 35 years above. 45.6 percent of the respondents were married, 36.8 percent have never been married, 10 percent divorced, while 7.6 percent were separated from their couple. On highest qualification of the respondents, 30 percent possess First School Leaving Certificate (FSLC), 40 percent hold Senior School Certificate Examination (SSCE), 23.2 percent were Bachelor of Science (B.Sc) and Higher National Diploma (HND) holders, 4 percent obtained National Diploma (ND) and Ordinary National Diploma (OND), while 2.8 percent claim to possess other certificate. This distribution shapes the pattern of responses towards research question.

## 4.3 Nature of industrial accident

Workers in industries do face numerous occupational health problems resulting from industrial accidents. Such problems seriously affect their productivity and life span. Diverse occupations exists, each has a peculiar accident associated with it. For instance, accidents arising from manufacturing industries include amputation, lacerations, puncture wounds, electrocution, fractures, head injuries and sprains and so forth. Efforts to combat the problem of industrial and occupational accidents in developing countries have been hampered by limited financial resources and lack of adequate data. In light of such limitations, it is therefore critical that the conventional antecedents of industrial mishaps that may affect worker safety at workplace are carefully examined.

**Table 4.3**: Percentage of responses rate on the nature of industrial accident

| S/N | Variables | Rating | | | | | Mean Score $\bar{X}$ | % $\frac{\sum X}{X} \times \frac{100}{1}$ N=250 |
|---|---|---|---|---|---|---|---|---|
| | | VL 1 | L 2 | A 3 | H 4 | VH 5 | | |
| 1 | Accidents/injuries/bruises | 0 | 5 | 36 | 100 | 109 | 4.252 | 10.61 |
| 2. | Lifting hazardous objects | 23 | 74 | 82 | 46 | 25 | 2.904 | 7.24 |
| 3 | Chemicals hazards | 15 | 62 | 50 | 94 | 29 | 3.240 | 8.10 |
| 4 | Infection/germs/disease | 18 | 78 | 75 | 59 | 20 | 2.940 | 7.33 |
| 5 | Physical hazards | 15 | 45 | 80 | 70 | 40 | 3.300 | 8.22 |
| 6 | Dirt and dust particles | 23 | 68 | 80 | 60 | 19 | 2.936 | 7.32 |
| 7 | Eye strain/skin problems | 11 | 80 | 59 | 80 | 20 | 3.072 | 7.66 |
| 8 | Machinery/electrical faults | 5 | 50 | 39 | 80 | 76 | 3.688 | 9.19 |
| 9 | Respiratory/lung problems | 40 | 150 | 30 | 15 | 15 | 2.260 | 5.64 |
| 10 | Biological hazards | 142 | 33 | 55 | 20 | 0 | 1.812 | 4.52 |
| 11 | Falling/tripping | 0 | 20 | 48 | 60 | 122 | 4.136 | 10.31 |
| 12 | Ergonomic hazards | 135 | 59 | 46 | 10 | 0 | 1.724 | 4.30 |
| 13 | Fatal Injury/Amputation | 204 | 41 | 5 | 0 | 0 | 1.204 | 3.00 |
| 14 | Death | 226 | 22 | 2 | 0 | 0 | 1.096 | 2.73 |
| 15 | Routine medical check | 163 | 40 | 47 | 0 | 0 | 1.536 | 3.83 |

**Source:** Field Survey, 2014 **Total:** 40.1 100

Table 4.3 above represents how workers responded to variable associated with nature of industrial accidents. Going by workers' responses, 10.61 percent of the respondents which constituted the highest responses rate admitted that industrial accidents such as injuries and bruises were very common at workplace. In the same vein, accident resulting from falling/tripping represents 10.31 percent of the responses rate as the second highest nature of industrial accident that usually occurred in manufacturing industry. Also, machinery/electrical faults, physical hazards, and chemical hazards represent 9.19, 8.22, and 8.10 percents of the responses rate respectively which consolidated the highest rate of industrial accidents. Death got the

lowest responses rate of 2.73 percent as a nature of industrial accident to the tune of 2 cases per every 109 accidents occurred; second to the lowest is fatal injury/amputation with 3 percent of the responses rate as nature of industrial accident that represents 5 cases per every 109 accidents rate in the industry.

In conducting IDI on the issue of industrial accidents reported and recorded per annum, majority of the interviewees held similar views; for example, an Operative rightly puts that:

> *Industrial accidents are not properly recorded and reported but it is usually occurred due to negligence of safety rules by the employees.*

Similarly, a Charge Hand who shared similar opinions contended that:

> *Accidents often occurred in industry due to man-made or natural factors in the course of industrial activity to meet the demand of changes of technological advancement for mass production which brought about untold pain and industrial accident not anticipated.*

From the qualitative data gathered, it has been discovered that there are various cases of industrial accidents but there were not properly reported and reported as measures against its subsequent occurrences. It is regularly occurred due to workers negligence of safety rules and presence of obsolete work equipments that portray danger to industrial workers. Beside, observation during field work revealed that air pollution posed a serious health problem in industry. Apart from contamination of air and the entire environment through automobile and industrial fumes, it introduces harmful pollutants from the exhaust of internal combustion and diesel engines. The pollutants affect the entire body organs and cells causing such risk conditions as cancer, degenerative and chronic diseases.

## 4.4 Accident preventive measures in industry

Efforts to combat the problem of industrial and occupational accidents in developing countries have been hampered by limited financial resources and lack of

adequate data. In light of such limitations, prevention emerges as the most cost effective strategy to decrease disability and the high death toll in the workplace.

**Table 4.4:** Percentage of responses rate on accident preventive measures.

| S/N | Variables | Rating | | | | | Mean Score | % |
|---|---|---|---|---|---|---|---|---|
| | | SA **1** | A **2** | UD **3** | D **4** | SD **5** | $\bar{X}$ | $\frac{\sum X}{X} \times \frac{100}{1}$ **N=250** |
| 1 | There are provisions of safe premises, safe procedure, and safe machine for workers in the company. | 24 | 56 | 25 | 65 | 80 | 3.484 | 9.86 |
| 2 | Workers regularly put on their Personal Protective Equipments (PPE) at workplace | 105 | 60 | 20 | 65 | 0 | 2.180 | 6.17 |
| 3 | Safety audits are regularly conducted in my company to check and report industrial accidents. | 0 | 15 | 4 | 81 | 150 | 4.464 | 12.64 |
| 4 | There is well define policy guideline on safety precaution at the workplace. | 0 | 5 | 9 | 66 | 170 | 4.568 | 12.93 |
| 5 | When fellow workers ignore safety procedure at workplace, I feel it is none of my business. | 86 | 70 | 19 | 55 | 30 | 2.588 | 7.33 |
| 6 | Proper ventilation to avoid excessive heat or humidity is maintained in the company. | 0 | 17 | 2 | 82 | 149 | 4.452 | 12.61 |
| 7 | Workers' metabolic demands for a job done in hot and humid environments is evaluated at workplace to recommend a work-rest regime that prevent accidents. | 0 | 5 | 10 | 80 | 155 | 4.540 | 12.85 |
| 8 | There is proper conduct of pre-employment and periodic examination of employees in industry to determine workers' health status on the job. | 0 | 2 | 23 | 65 | 160 | 4.532 | 12.83 |
| 9 | Supervisors give preliminary information to workers regarding the inherent risks of any occupation before he/she is allowed to work alone in the industry. | 0 | 10 | 4 | 84 | 152 | 4.512 | 12.78 |
| | **Source:** Field Survey 2014 | | | | **Total:** | | 35.32 | 100 |

Table 4.4 above has shown responses of workers on accident preventive measures in industry. On the table, it has been discovered that workers strongly disagreed on well define safety policy and guideline at workplace with 12.93 percent of the responses rate which is the highest rating among other variables. Other related issues like evaluation of workers' metabolic demands for a job done in hot and humid environment to recommend a work-rest regime was disagreed by the workers as usual practices of accident preventive measures with 12.85 percent of the responses rate. Proper conduct of pre-employment and periodic examination in industry to determine workers' health status on the job and safety checklist were not regularly practice toward preventing accidents at workplace with 12.83 and 12.64 percents responses rate respectively, all these affirmative variables got highest responses of disagreement by the workers which show that there were low levels of accidents preventive measures in industry. Regularly uses of Personal Protective Equipments (PPE) by the workers got the lowest rating of 6.17 percent as against 12.64 percent rate of responses on safety audit conducted in the company on the uses of PPE.

In the course of conducting in-depth interview on accidents preventive measures in industry, a Foreman admitted on behalf of the majority of interviewees that:

> *Am ignorant of Factory Acts and Workmen's Compensation Acts but when sustained work-related injuries, company paid for his/her hospital bills without enjoyed any compensation claims.*

However, an Operative who shared same views puts that:

> *Industrial accidents are believed to be inevitable and so are regarded as an act of God; no human efforts can prevent it.*

This qualitative data had shown that lack of proper mechanism in enforcing OSH regulations in Nigeria hindered promotion of industrial safety at workplace.

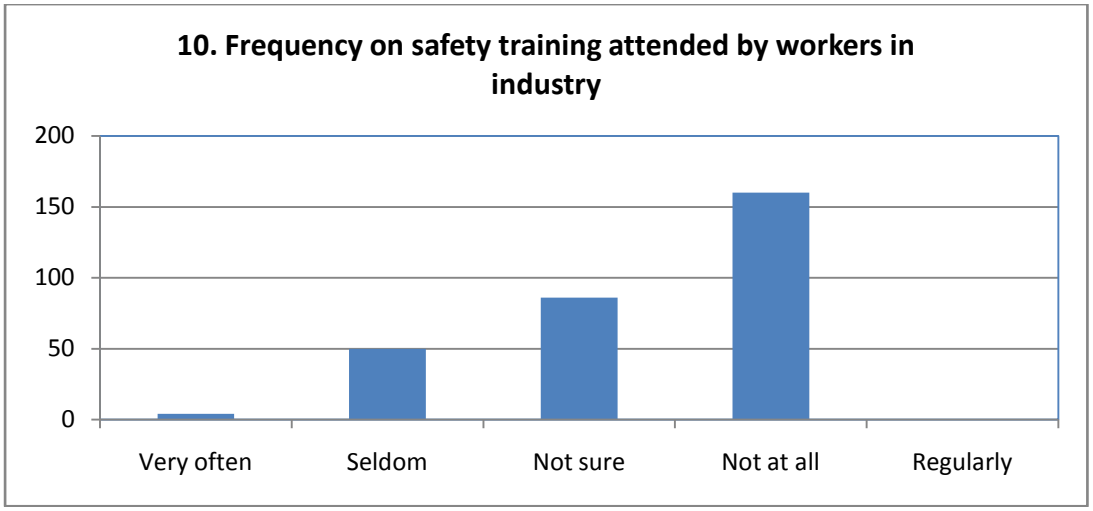


Figure 4.1: Bar chart showing how often workers attended safety training in industry.
**Source:** Field survey, 2014

Figure 4.1 and 4.2 consolidated table 4.4 variables on accidents preventive measures in industry. From the bar chart, it has been observed that safety training programme that is crucial for accident prevention in industry is not a regular practice by the company where 153 workers represents 61 percent admitted that they never attended any form of safety training programme which constituted the highest bar while none of the respondents agreed that safety training programme is regularly attended by workers. Only 3 workers represents 1.2 percent responded that it is very often.

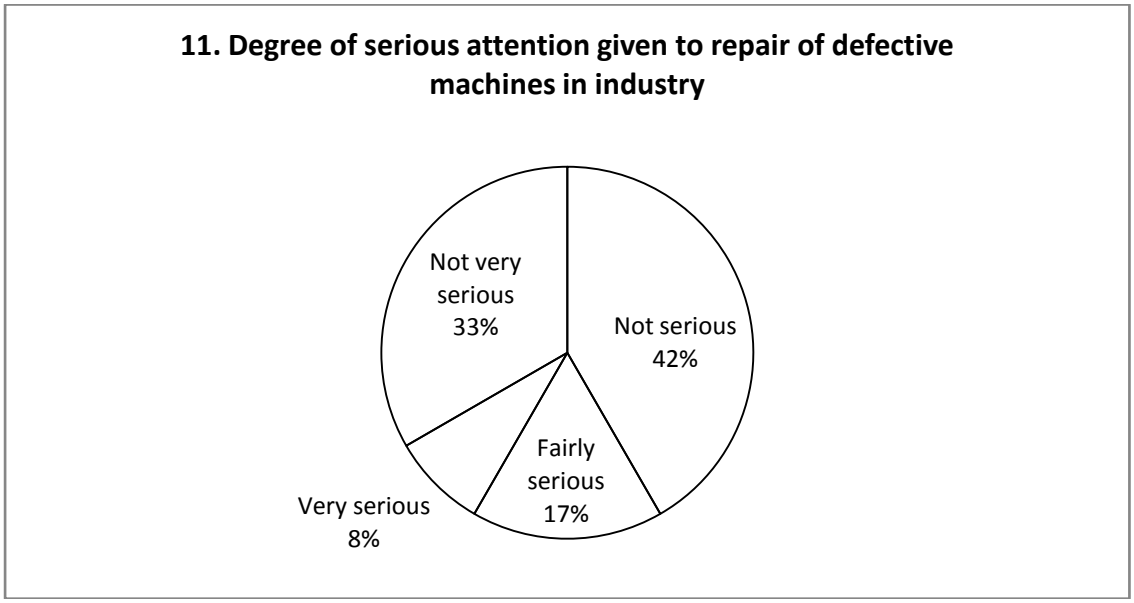


Figure 4.2: Pie chart showing degree of serious attention given to repair of defective machines in industry. **Source:** Field survey, 2014

Figure 4.2 Shows that 42 percent responded that no serious attention has been given to repair of defective machines in industry. Only 8 percent responded that it was very serious.

## 4.5 Attitude of workers towards industrial safety

It makes sense to study and know about attitude because strong attitude affect a person's behaviour toward objects, person, situation, events, and safety culture or anything that might trigger positive or negative reactions. As a result, employees' knowledge and attitudes represent one of the key areas of measuring organizational safety culture. Work environments can change frequently as companies update work procedures, introduce improved technology and add new products and customers. Employees who display a positive attitude toward change may welcome and even embrace it, as they may view it as a chance to enhance their skills for improved performance and increased organizational's productivity.

Most attempts to create attitudinal-driven safety in industry usually hinge upon the belief and knowledge of workers on safety culture (Indeed, this is a very common opinion amongst many safety professionals). Remedies tend to rely on publicity campaigns and safety training to bring about changes in people's attitudes towards safety, which in turn is expected to change people's behaviour. Although positive safety attitudes are important and very desirable, the link from attitude change towards safety culture is very weak. This can be explained by the fact that a single attitude comprises of at least three components of knowledge: thinking (cognitive), feeling (emotional), and the intention to act on it (commitment). Additionally, a single attitude is usually linked with a set of other related attitudes. Logic dictates, therefore, that attempts at attitude change must target each individual's knowledge on existing safety policies (Glendon *et al.,* 2006).

**Table 4.5**: Percentage of responses rate on workers' attitude towards industrial safety

| S/N | Variables | RATING | | | | | Mean Score $\bar{X}$ | % $\frac{X}{\sum X} \times \frac{100}{1}$ N=250 |
|---|---|---|---|---|---|---|---|---|
| | | SD 1 | D 2 | UD 3 | A 4 | SA 5 | | |
| 1 | Workers behave safe when their Salary/allowance is enough. | 0 | 2 | 8 | 65 | 175 | 4.652 | 8.44 |
| 2 | Passion for the job reduces unsafe behaviour. | 0 | 0 | 15 | 80 | 155 | 4.560 | 8.28 |
| 3 | Co-workers often give tips to each other on workplace safety. | 0 | 20 | 10 | 70 | 150 | 4.400 | 7.99 |
| 4 | Good Retirement Saving Plan (RSP) encourages right attitude towards industrial safety in order to enjoy retirement age. | 0 | 10 | 17 | 70 | 153 | 4.464 | 8.10 |
| 5 | Job satisfaction/motivation encourages safe behaviour. | 0 | 8 | 10 | 82 | 150 | 4.496 | 8.16 |
| 6 | The balance between work and home life promotes industrial safety. | 20 | 35 | 25 | 95 | 75 | 3.680 | 6.68 |
| 7 | Friendly working environment supports safe behaviour. | 25 | 40 | 40 | 85 | 60 | 3.460 | 6.28 |
| 8 | I prefer safety at workplace even if it costs a lot. | 15 | 30 | 20 | 95 | 90 | 3.860 | 7.00 |
| 9 | I am ready to take extra risk on my job so long as accidents' compensation claims are better. | 20 | 50 | 45 | 75 | 60 | 3.420 | 6.21 |
| 10 | Industrial strike departs workers from safety at work. | 20 | 27 | 23 | 100 | 80 | 3.772 | 6.84 |
| 11 | Religious intolerance promotes bad attitude towards safety. | 15 | 18 | 20 | 110 | 87 | 3.994 | 7.25 |
| 12 | It is always important to have good working relationship with my supervisor to promote industrial safety. | 0 | 3 | 7 | 87 | 153 | 4.560 | 8.28 |
| 13 | Safety policy of my company does not encourage safe behaviour on site. | 0 | 0 | 5 | 91 | 154 | 4.596 | 8.34 |
| 14 | Measurement of safety level in the industry is attitudinal based. | 206 | 42 | 2 | 0 | 0 | 1.184 | 2.15 |
| | **Source:** Field Survey, 2014 | | | | | **Total:** | 55.098 | 100 |

Table 4.5 above hinged upon the workers' attitudinal related variables towards industrial safety where majority of workers believe that salary/allowances influence their safe behaviour on the job received the highest responses rate with 8.44 percent. Safety policy in company that does not encourage safe behaviour on site also got the second highest responses with 8.34 percent. Other attitudinal related issues like passion for one job, retirement saving plan, job motivation, sharing of safety knowledge/skills, and good working relationship cut the attention of respondents with slight differences that range from 8.28 to 6.28 percent. Religious intolerance and balance between work and home life constituted responses with 7.25 and 6.38 percents respectively. Respondents strongly disagreed on a statement that measurement of safety level in industry is attitudinal base with 2.15 percent of the responses rate. On this note, it has been generally observed that industrial safety programme is not attitudinal based.

During In-Depth Interview (IDI) conducted, majority of the interviewees have a similar view on the issue of attitude of workers towards industrial safety. An Operative who is one of the informants admitted that:

> *Poor remunerations and staff motivation are major causes of unsafe behaviour at workplace as most of the workers choose to behave abnormally when their efforts towards production process are higher than monetary value attached to it.*

However, Personnel Manager shared same view with few others that:

> *Lack of awareness on role of workers' attitude in promoting industrial safety pose a great challenge in dozen of industrial accidents that continue eating deeply into the cost effective of industrial safety management system.*

From this qualitative data, it was discovered that what constitutes workplace safety is hinged upon the conflict of interest between the management and field

workers (operatives), the former sees it as a product of exploitation and the latter ascribe it to cost implication of safety management in workplace.

### 4.6 Socio-cultural factors towards industrial safety

Workers working within the organization constitute part of the organization and safety culture cannot stand without integral societal culture. In view of this, societal forces that dictate the prevalent attitudes and behaviours relating to safety within a given culture are fundamental to the study of safety climate.

**Table 4.6:** Percentage of responses rate on socio-cultural factors towards industrial safety

| S/N | Variables | RATING | | | | | Means Scores $\bar{X}$ | % $\frac{X}{\sum X} \times \frac{100}{1}$ N=250 |
|---|---|---|---|---|---|---|---|---|
| | | SA 1 | A 2 | UD 3 | D 4 | SD 5 | | |
| 1 | Socio-cultural background of workers conforms with industrial safety rules at workplace | 25 | 10 | 8 | 119 | 88 | 3.940 | 14.14 |
| 2 | Existing Safety culture in the company influences my behaviour in workplace | 5 | 40 | 24 | 126 | 55 | 3.744 | 13.44 |
| 3 | Safety culture should not encompasses social environment of workers | 0 | 16 | 19 | 75 | 140 | 4.292 | 15.41 |
| 4 | Annual cultural festivity promotes industrial safety | 90 | 103 | 7 | 40 | 10 | 2.108 | 7.57 |
| 5 | Safety rules are difficult to understand in my language | 160 | 50 | 20 | 20 | 0 | 1.600 | 5.74 |
| 6 | Safety policy in my company encourages socio cultural support from workers | 0 | 3 | 0 | 200 | 47 | 4.164 | 14.94 |
| 7 | Accident can happen to anyone regardless of one socio-cultural background | 65 | 55 | 0 | 40 | 90 | 3.140 | 11.27 |
| 8 | Safety rules in my company are culturally driven. | 0 | 0 | 0 | 33 | 217 | 4.872 | 17.49 |
| | **Source:** Field survey, 2014 | | | | | **Total:** | 27.86 | 100 |

Table 4.6 above centred on socio-cultural factors towards industrial safety with strong emphasis on how background of individual workers contributes to industrial safety practices. It is obvious from above table that industrial safety rules

are not culturally driven with the highest responses rate of 17.49 percent. In the same vein, it has shown that safety culture in the company failed to encompass social environment of workers which got attention of respondents with the second highest responses rate of 15.41 percent. Another cultural related factor got setback on industrial safety issues when respondents strong disagreed that safety policy encourages socio-cultural support from workers on safety management with 14.94 percent of the responses rate. Relationship between socio-cultural factors and industrial safety practices continue to suffer when respondents strongly disagreed on conformity of socio-cultural background of workers and industrial safety practices with 14.14 percent of the responses rate. The least of the rating lied on a statement that safety rules are difficult to understand in my language with 5.74 percent of the responses rate. This shows that industrial safety practices declined to socio-cultural environment of workers which made it difficult for them to comply.

From the in-depth interview conducted, majority were of the same view on the issue of enforcing safety legislation within the cultural context. Among them, a Safety Officer rightly puts that:

> *Many developing countries have health and safety legislation in place to protect workers but experience difficulties in implementing the legislation due to a lack of mechanisms for enforcing it within cultural context. In view of this, the role of a well-articulated and properly communicated socio-cultural impediment towards industrial safety cannot over be emphasized especially in industrial accident preventive measures.*

In the same vein, few interviewees believed that language barrier constituted a major challenge in implementing safety programmes and policies. An Operative who is one of key informants summarized their views as:

> *English terms used in describing industrial safety are confusing and difficult to comprehend let alone to apply them in the production process.*

In justification, the entire qualitative data gathered on the issues of socio-cultural factors towards workplace safety shows that industrial safety programmes are not cultural-driven.

## 4.7 Index of attitude and behaviour towards industrial safety

In a bid to transform the overall analysis into its manageable unit, all data collected in respect of attitude and behaviour were brought together as a whole. Attitude and behaviour are closely related variables that require a composite measure (index) through the combination of multiple elements to more similar items that are common to the related concepts. For instance, careful examination of relationship between attitude and behaviour related variables on Table 4.5 have identified industrial safety and working environment as two indicators for accumulating percentage of rating assigned to individual variables.

**Table 4.7**.: Index of attitude and behaviour towards industrial safety

| S/N | Theme | Attitude (percentage) | Behaviour (percentage) |
|---|---|---|---|
| 1 | Industrial safety | 47.45 | 47.7 |
| 2 | Working environment | 52.55 | 52.9 |
| | Total: | 100 | 100 |

**Source:** Field Survey. 2014

Table 4.7 above combined workers' attitude and behaviour related variables into two (2) categories, namely; industrial safety and working environment to show the degree of their relationship. From the analysis, researcher discovered that workers' behaviour towards industrial safety recorded high level responses rate of 47.7 percent as against 47.45 percent on workers' attitude with 0.25 percentage-point difference. On the other hand, behaviour of workers towards working environment received highest responses rate of 52.9 percent and 52.55 percent on their attitudes respectively with 0.35 percentage-point difference. This shows that attitude and behaviour are closely related in term of their influence towards individual variables.

## 4.8 Pearson's (product-moment) Correlation Coefficient Between Responses Rate

Pearson's correlation coefficient is adopted to measure the exact level of association and direction of correlation that exist between two or multiple responses rate on each of the table that reflected objective of study. The researcher computes the exact level of relationship between responses rate of related variables using Statistical Package for Social Sciences (SPSS 15.0 Version).

**Table 4.8.1:** Pearson's correlation between responses rate of natures of industrial accidents related variables on Table 4.3

| 2-Tailed | | VL | L | A | H | VH |
|---|---|---|---|---|---|---|
| **VL** | Pearson Correlation | 1 | -.264 | -.629(*) | -.866(**) | -.639(*) |
| **L** | Pearson Correlation | -.264 | 1 | .214 | -.093 | -.380 |
| **A** | Pearson Correlation | -.629(*) | .214 | 1 | .456 | .062 |
| **H** | Pearson Correlation | -.866(**) | -.093 | .456 | 1 | .662(**) |
| **VH** | Pearson Correlation | -.639(*) | -.380 | .062 | .662(**) | 1 |
| | **N:** | 250 | 250 | 250 | 250 | 250 |

(*) Correlation is significant at the 0.05 level (2-tailed). **Source:** Field Survey, 2014

(**) Correlation is significant at the 0.01 level (2-tailed).

Table 4.8.1 shows correlation measures that exist between responses rate used to find out the nature of industrial accidents. It reveals that there exists a significant negative relationship between Very Low (VL), Average (A), and Very High (VH) at 95 percent confidence level. Similarly, there exists significant negative relationship between Very Low (VL) and High (H) at 99 percent confidence level. It also shows that there exists a significant negative relationship between H and VH at 99 percent confidence level while all other relationship between responses rate had neither positive nor negative significant relationships. All the significant relationships were

moving towards negative direction which shows that responses on the related variables of nature of industrial accidents are independent to one another in related to their harmful effects engender by workers during industrial activity.

**Table 4.8.2:** Pearson's correlation between responses rate of accident preventive measures related variables on Table 4.4

| 2-Tailed | | SA | A | UD | D | SD |
|---|---|---|---|---|---|---|
| **SA** | Pearson Correlation | 1 | .877(**) | .526 | -.651 | -.972(**) |
| **A** | Pearson Correlation | .877(**) | 1 | .573 | -.643 | -.950(**) |
| **UD** | Pearson Correlation | .526 | .573 | 1 | -.818(**) | -.586 |
| **D** | Pearson Correlation | -.651 | -.643 | -.818(**) | 1 | .624 |
| **SD** | Pearson Correlation | -.972(**) | -.950(**) | -.586 | .624 | 1 |
| | **N:** | 250 | 250 | 250 | 250 | 250 |

(**) Correlation is significant at the 0.01 level (2-tailed). **Source:** Field Survey, 2014

Table 4.8.2 reveals correlation measures that exist between responses rate used to assess accident preventive measures in industry. It shows that there exists a significant positive relationship between Strongly Agree (SA) and Agree (A), but negative relationship on Strongly Disagree (SD) at 99 percent confidence level. In the same vein, there exists significant negative relationship between Agree (A) and Strongly Disagree (SD) at 99 percent confidence level, also a significant negative relationship exists between Undecided (UD) and Disagree (D) at 99 percent confidence level while all other relationship between responses rate had neither positive nor negative significant relationship. The movement of significant relationships towards more negative than positive directions shows that majority of respondents have divergent views on how they assess accidents preventive measures

in industry which means there are no well-define safety guidelines on accidents prevention ethics at workplace.

**Table 4.8.3:** Pearson's correlation between responses rate of workers attitude towards industrial safety related variables on Table 4.5

| 2- Tailed | | SD | D | UD | A | SA |
|---|---|---|---|---|---|---|
| **SD** | Pearson Correlation | 1 | .509 | -.203 | -.814(**) | -.742(**) |
| **D** | Pearson Correlation | .509 | 1 | .657(*) | -.232 | -.897(**) |
| **UD** | Pearson Correlation | -.203 | .657(*) | 1 | .363 | -.431 |
| **A** | Pearson Correlation | -.814(**) | -.232 | .363 | 1 | .327 |
| **SA** | Pearson Correlation | -.742(**) | -.897(**) | -.431 | .327 | 1 |
| | **N:** | 250 | 250 | 250 | 250 | 250 |

(**) Correlation is significant at the 0.01 level (2-tailed). **Source:** Field Survey, 2014

(*) Correlation is significant at the 0.05 level (2-tailed).

Table 4.8.3 indicated correlation measures that exist between responses rate used to examine workers' attitude towards industrial safety. It revealed that there exists a significant negative relationship between Strongly Disagree (SD), Agree (A) and Strongly Agree (SA) at 99 percent confidence level. In the same vein, there exists significant positive relationship between Disagree (D) and Undecided (UD) at 95 percent confidence level, also a very significant negative relationship exists between Disagree (D) and Strongly Agree (SD) at 99 percent confidence level while all other relationships between responses rate had neither positive nor negative significant figures. The movement of significant relationships towards more of negative than positive directions revealed that very few respondents believed that right attitude on the job promote industrial safety while majority of them ascribed bad attitude on the job to poor salary/allowance and staff motivation.

**Table 4.8.4:** Pearson's correlation responses rate of socio-cultural factors towards industrial safety related variables on Table 4.6

| | 2-Tailed | SA | A | UD | D | SD |
|---|---|---|---|---|---|---|
| **SA** | Pearson Correlation | 1 | .658 | .195 | -.599 | -.644 |
| **A** | Pearson Correlation | .658 | 1 | .150 | -.479 | -.630 |
| **UD** | Pearson Correlation | .195 | .150 | 1 | -.066 | -.314 |
| **D** | Pearson Correlation | -.599 | -.479 | -.066 | 1 | -.140 |
| **SD** | Pearson Correlation | -.644 | -.630 | -.314 | -.140 | 1 |
| | **N:** | 250 | 250 | 250 | 250 | 250 |

**Source:** Field Survey, 2014

Table 4.8.4 reveals correlation measures that exist between responses rate used to explore the socio-cultural factors towards industrial safety. It is clear from the table that there are neither positive nor negative significant relationships exist between variables; none of the figure reached 95 percent confidence level to be considered as either positive or negative significant relationship. In this case, it shows that respondents did not see any industrial safety policy or programmes that are culturally-driven.

## 4.9 Discussion of Findings

After the raw data gathered from field were analyzed and presented, discussion of findings is necessary to harmonize all the information towards achieving objectives of study. This discussion is based on the recap of the major findings in line with the objectives of the study with reference to literature reviewed and uses of theoretical orientation to support findings.

The study revealed that industrial accidents/injuries/bruises are at alarming rate when compare with other nature of hazards that possess a potential harms to

workers at workplace. Work-related accidents resulting from lifting hazardous objects, germs, chemical hazards, noise and air pollution, mechanical/electrical faults, absence of medical check, biological hazards, physical hazards, eye strain/skin problems to fatal injury/ amputation, and death recorded a low responses rate that stood at 2 cases per every 109 incidents that occurred. It has been established that respondents only pay attention to immediate accidents that occurred during industrial activity than what constitute potentials to danger of industrial accidents. When asked during interview on the records of industrial accidents, their responses show that industrial accidents are not properly recorded and reported but admitted that it often occurred due to negligence of safety rules by the employees. To support this finding, Juan Somavia, 9th Director-General of ILO puts that occupational safety and health is vital to the dignity of work. Still, every day, on average, some 5,000 or more women and men around the world lose their lives because of work-related accidents and illness. Decent work must be safe work, and we are a long way from achieving that goal.

Industrial accidents resulted from unsafe conditions such as falling/tripping during industrial activity and faulty machine/electrical equipments cut attention of the respondents as they viewed it as one of the commonest form of industrial accidents. From the quantitative and qualitative data gathered, the rate of falling/tripping is one occurrence per day but few of them lead to an accident. On the condition of machine/electrical equipments in related to its nature of industrial accidents, the study shows that obsolete work equipments that portray danger to industrial workers were very common in industry. Beside damages cause to production line, faulty machine/electrical equipments have recorded most of fatal injury/amputation in industry.

Death as a permanent disappearance of life was classified as the least nature of industrial accidents from the field that stood at two (2) cases per every one hundred nine (109) industrial accidents that occurred. Most of death cases that occurred at workplace were linked to machine failure and unsafe behaviours of the affected workers. At international level, according to the International Labour Organization (ILO) reports on safety and health at work (2013), more than 337 million accidents happen on the job each year, resulting, together with occupational diseases, in more than 2.3 million deaths annually.

Pearson's correlation coefficient that exists between responses rate used to find out the nature of industrial accidents moved towards negative direction which shows that responses for/against the related variables are independent to one another in related to their harmful effects engender by workers during industrial activity.

Similarly, findings on the nature of industrial accidents in Kaduna Industrial areas shared Achalu's (2000) views on the conditions of work environment that can precipitate accident to workers. They include nature and man-made factors. Nature factors include those factors that can obscure visibility such as: rain, dust, smoke, wind, sunlight, foreign body in the eyes, others include floods, tornados, earthquakes, land slide, extreme temperatures, and inadequate ventilation. Man-made factors that cause accidents include: filthy environment, slippery floors, improper storage of items, faulty machine, use of generators, candles, insecticides pesticides etc. Other predisposing factors to accident include; bad lifting technique causing spinal injuries; assaults in work site, direct explosion on the unit, carbon monoxide from combusting fuel, wood oil, vehicles, generators, faulty electrical appliances etc. These affect workers' health and caused fatal injuries in production line in industry if not prevented.

During field activity, workers opined that based on their knowledge, poor remunerations and staff motivation are one of the major factors that causes unsafe behaviour at workplace. It was discovered that most workers choose to behave abnormally when their efforts towards production process are higher than monetary value attached to it. On this note, the finding revealed that attitudinal related factors causes workplace accident rather than relied heavily on industrial safety programmes that are not attitudinal-driven. In this case, organizations looking for ways to improve workplace safety and increased productivity can start by evaluating the attitude their employees bring to the job each day. A positive or negative attitude affects how workers approach their jobs, and attitudes can have a ripple effect on those around them. In regard to this finding, a positive attitude will have a positive impact on industrial safety practices provided there are good salary/allowance and staff motivation for industrial workers.

In the course of findings, workers claimed that passion for one job reduces unsafe behaviour that may cause work-related accidents. They were of the opinions that safety precaution is maintained by those who love their job and hardly fall victims of industrial accidents, and the reverse is true. To buttress this fact from the reviewed literature, unsafe human behaviours according to Achalu (2013) are the principal cause of up to 80% of industrial accidents. Causes include: Psychological factors like anger, hatred, fear, anxiety, over confidence and joy. The relations to these factors can push the worker to ignore safety precautions and then act carelessly and recklessly thereby acting out what he/she could not in normal self.

The synergy between workers' attitude and industrial safety received a severe attack in the course of field work when the respondents admitted that most of the safety signs and symbols pasted in the company instill sort of fear of potential dangers

where there are not necessary; there are not encouraging man-machine to be friendly. In this case, they opted for periodic review of safety programmes that is workers' centered and attitudinal driven. This finding contradicts the efforts of early safety experts toward industrial safety that focused primarily on the prevention of industrial accidents in physical ways such as fencing machinery, and conducting safety inspection. They believed that unsafe conditions play the most important role in these accidents, so they did their best to remove the physical hazards at workplace (Reason, 1997).

The outcome of Pearson's Correlation Coefficient on workers' attitude towards industrial safety practices revealed that significant relationships between responses rate are more of negative than positive direction which means very few respondents believed that right attitude on the job promote industrial safety while majority of them ascribed bad attitude on the job to poor salary/allowance and staff motivation. Lack of awareness on role of workers' attitude in promoting industrial safety pose a great challenge in dozen of industrial accidents that continue eating deeply into the cost effective of industrial safety management system.

Prevention of accidents in workplace as one of the objective of the study seems to be neglected in industries as the findings revealed that most of industrial accidents are preventable through well articulated accidents preventive measures such as provision of safe working environment, safe procedure, and safe machines for workers in company. However, these practices tend to decline at workplace every day unless a particular accident has occurred, most of workers were mislead that industrial accident is 'the work of God' no human measures can prevent it.

Another gray area of accident preventive measures that received great attention of the respondents is on the issues of industrial safety policy guideline. The

findings show that industrial workers were not fully informed on existing safety policy guideline through appropriate training intervention for the prevention of industrial accidents; they were ignorant of Factory Acts and Workmen's Compensation Acts but only admitted that when sustained work-related injuries, company paid for his/her hospital bills without enjoyed any compensation claims. This dubious practice contradicts Labour, Safety, Health and Welfare Bill of 2012 (which awaits presidential assents) designed to provide an open and fair safety management system and guarantee compliance to compensation claims for employees or their dependants in the event of death, injury, disease or disability arising out in the course of employment. The Bill is also intended to provide for safer working conditions for employees by ensuring that all relevant stakeholders contribute towards the prevention of workplace disabilities and other occupational hazards.

Going by the findings on industrial accidents preventive measures, it is clearly obvious from the field that safety audits/checklists were not regularly conducted in the company to report and checkmate industrial accidents as the case may be. Workers were left to be at their own liberty not only towards safety precaution but also unsafe behaviours that triggered industrial accidents. It was confirmed from the field that most of accidents that occurred at workplace were not reported and investigated as a measure against subsequent cases of work-related accidents as it was put forward by FMLP (2006) reports that another cause for worry is the lack of statistical data that can help identify accident frequency by region, sector and severity and help inform decision makers on areas to strengthen regulations. Accident reporting is almost nonexistent and even when reported, data is unavailable and no action is taken. Available statistics show that less than 100 accidents were reported in (2001 to 2006)

nationally, with exception of 2005 in which 120 accidents were reported. This is a key area that must be improved if industrial safety is to be taken seriously (FMLP,2006).

In the process of recruitment, health status of new employees was not examine by industry's affiliated medical personnel to determine what becomes of worker's health on the job. In this regard, frequent cases of illness were common among workers because those suffering from communicable diseases spread them to other co-workers. They only admitted that First Aid box was provided for mild emergence cases of headache, cold, and catarrh, any cases of disease beyond these are referred to industry affiliated hospital for treatment.

The significant relationship that exist between responses rate designed to access accidents preventive measures in industry moved towards more negative than positive directions which revealed that accidents preventive measures in industry are very weak as there are no well-define safety policy guidelines to support it as Asogwa (2007) puts, nevertheless, accidents occur and constitute the most important threat to survival of workers due to ineffective monitoring and utilization of safety policy by the stakeholders .

The role of socio-cultural background of workers towards accidents prevention at workplace cannot be over emphasized. In this regard, socio-cultural measures were taken as a mean of promoting industrial safety. When issues like synergy between socio-cultural background of workers and industrial safety were raised in the field, respondents strongly disagreed with the fact that most of the English terms used in describing industrial safety are confusing and difficult to comprehend let alone to apply them in the production process. This testify and consolidate the work of Khein et al. (2008) as, "many developing countries have health and safety legislation in place to protect workers but experience difficulties in

implementing the legislation due to a lack of mechanisms for enforcing it within cultural context".

To support this finding with more similar literature, Latino Immigrants and Spanish-speaking workers often receive less job safety and health training because they do not speak English well or even at all. One Latino worker in a survey by the CPWR said that people appear to be less willing to explain things to those with limited English, and foremen get frustrated trying to explain to workers how to do a task safely. To further complicate the situation, the construction industry uses very technical terms, and even Latino workers with Basic English skills find it difficult to communicate (Ruttenberg, 2004).

Promotion of industrial safety within the social and cultural contexts got setbacks when workers admitted that most of their suggestions towards reducing work-related accidents were not taken serious by the employers because they refer them as baseless without scientific prove while accidents rate keep on increasing on the daily bases. Unlike other countries where culture plays a significant role towards industrial safety as appeared in the CPWR survey report on Latinos with construction experience outside the United States. All responses expressed difficulty in adjusting to construction work within the U.S. and show the differences in cultural understanding across varying backgrounds. A Cuban said that in his home country safety equipment was difficult to get and safety regulations were never of any use. A roofer born in Mexico stated he had never used personal protective equipment and was unaware of the importance of safety. He also stated he used to work with cement in his bare feet which is caustic. A Columbian electrician stated in Colombia the focus is on production and there are few safety regulations (Ruttenberg, 2004).

In the course of field work, majority of workers confirmed that they were prone to victim of industrial accidents when compelled to carry out a given task than when they were left alone to do the job after instructions are given. This finding compliment the study conducted by Nancy and Antonio (2010) for Latino men in construction industry, among them, the idea of machismo has a significant impact on job site safety. It plays a role in the higher injury rates suffered by Latinos because it discourages Latino workers from wearing safety equipments.

The outcomes of Pearson's Correlation Coefficient analysis on the socio-cultural factors towards industrial safety shows it clearly that there were neither positive nor negative significant relationships exist between responses rate; none of the figure reached 95 percent confidence level to be considered as significant as any relationship below this level is uncertainty and risky. In this case, it means that respondents did not see any elements of industrial safety policies and programmes that are culturally-driven.

Simply put, the findings hinged upon attitude of workers as means of preventing industrial accidents to ensure a safer working environment that is better explained by Domino Theory; a theoretical orientation of the study. Herbert W. Heinrich, an early pioneer of accident prevention and industrial safety developed Domino Theory in the late 1920s, after studying the report of 75,000 industrial accidents, Heinrich concluded that;

- 88 percent of industrial accidents are caused by unsafe acts committed by fellow workers.
- 10 percent of industrial accidents are caused by unsafe conditions
- 2 percent of industrial accidents are unavoidable.

In the light of the above, workers' positive attitude on the job prevents 88 percent of industrial accidents. Therefore, industrial safety is a product of workers' attitude on the job.

Based on the tenets of Domino Theory which revealed attitudinal related factors that cause most of industrial accident has provided some useful insights into industrial safety programmes/policies through workers' attitudinal dimension for greater understanding of job attitudes, safe/unsafe behaviours, industrial safety practices, and the extent to which workers' attitudes and perception are associated with their safety culture towards preventing industrial accidents.

# CHAPTER FIVE
# SUMMARY, CONCLUSION AND RECOMMENDATION

## 5.1 Summary

This study is primarily focused on workers' attitude towards industrial safety of Kaduna industrial. What really informed study of this nature hinged upon the fact that poor and unsafe working conditions, rapid introduction of new industries, invention and application of new tools for mass production and other processes brought about industrial accidents such as amputation, lacerations, puncture wounds, electrocution, fractures, head injuries, sprains and so forth, that are not anticipated to the employees despite existing safety programmes in industries. All these resulted in significant dangers to both employees and their families. They became exposed to various occupational diseases and serious accidents aggravated by endemic diseases like malnutrition, worm infestation, malaria and others. It is against the backdrop, that the study used attitudinal approaches towards sustaining safer working environment for social and economic development.

This study was conducted at five (5) manufacturing companies in Kaduna industrial area, Nigeria. After specifying the strata of the study population with reference to the results of a pilot study, a sample size of 300 out of 768 total size of study population (sample frame) was determined for research instruments administration. However, 250 copies of questionnaire were retrieved with a sampling accuracy of 5 percent and confidence level of 95 percent.

The methodology was based on the survey instrument (questionnaire), in-depth interview, and observation methods of data collection that were designed to achieve objectives of the study through responses (data) gathered from the field. The

data were later analyzed and discussed by using percentage of distribution and statistical analysis.

The result of the findings revealed that increasing rate of workplace accidents are due to the fact that industrial safety programmes and policies are not properly implemented and monitored through work-related attitudes that causes majority of industrial accidents. Similarly, the study shown that workers pay little attention to hazards that posed a potential harms to their well-being in the course of industrial activity; accidents and death cases resulted from these incidents were linked to machine failure and unsafe acts of the affected workers.

The study has also shown that most of the safety signs and symbols pasted at workplace instill sort of fear of potential dangers where there are not necessary; workers admitted that there are not encouraging man-machine to be friendly and easily used.

Going by the findings, workers were not fully informed on existing safety policy guideline through appropriate training intervention for the prevention of industrial accidents; they were ignorant of Factory Acts and Workmen's Compensation Acts (WCA) of 2004 adopted in Nigeria as preventive measures of industrial accidents. In addition, it is clearly obvious that safety audits/checklists were not regularly conducted in the company as a means of reporting and recording cases of industrial accidents to checkmate or prevent industrial accident.

Promotion of industrial safety within social and cultural context got a setback when the findings show that most of the elements of existing industrial safety policies and programmes are not culturally-driven due to lack of its awareness.

## 5.2 Conclusion

Given the rapid economic growth and infrastructural development in Nigeria and Kaduna Industrial Area in particular, the absence mechanism for the promotion of industrial safety and enforcement of safety policies in industries are of great concern. It requires prompt attention otherwise the economic growth may be hampered in the face of this digital world where growing application of information technology (social network), which delivers information on the instant can damage the reputation of nations and industries at large. To cushion these effects, this study explores an approach of creating a safer work environment using workers' attitudinal dimension towards promotion of industrial safety practices.

Despite the dearth in attitudinal-base safety literature in Nigeria, sizable quality reviewed papers were found on extrinsic drivers such as engineering, safer work environments, training, and policies, political influence, inadequate funding, culture, and inadequate information but with little attention paid to job related attitudes that triggered most of industrial accidents due to imbalance connection between industrial safety programmes/polices and workers' safety attitude at workplace. Furthermore, other major limitations to optimum promotion of industrial safety identified by this study are: lack of knowledge of industrial safety policies, low level of skilled manpower, poor attitude to work, weak enforcement of safety policies, lack of governmental commitment and severity of penalties towards promoting industrial safety.

Therefore, creating a safer workplace is a matter of creating safe behaviour. In this sense, safety is not just justification; it is all about proper supervising and monitoring of right attitude on the job in related to industrial safety programme implementation simply known as attitudinal-driven safety programmes in industry.

## 5.3 Recommendations

Based on the findings of this study, the following recommendations will be useful in promoting industrial safety practices, these are:

1. In the face of improper application of industrial safety regulations in Nigeria and Kaduna Industrial Area in particular due to weak safety enforcement agency in Nigeria, there is urgent need for strengthen the responsibility of National Council for Occupational Safety and Health: an agency Federal Government of Nigeria to become more effective and efficient in regulating safety programmes, monitoring practical application of factory acts, and workers' compensation act towards minimizing industrial accidents.
2. It has become necessary now than before for industrial safety stakeholders to employ task risk analysis methods to screen and determine risky jobs in order to perform Work Hazards Analyses (WHAs) and appropriate interventions.
3. In addressing the paucity of valid workers' attitude assessments, the Work Safety Assessment (WSA) should be developed to identify employees who are likely to exhibit unsafe behaviour at work, and to assist industries prevent workplace accidents. Information provided by the Work Safety Assessment should be used by talent management professionals to manage industrial safety practices, make recruitment and retention decisions, or inform training interventions. The assessment is a measure of personality and cognitive factors which has demonstrated to predict work accidents.
4. The results of this study have called for urgent attention in designing and implementing industrial safety training programmes. Such training interventions should primarily focus on the importance of PPEs and other safety devices in order to ensure their being user-friendly.

5. In line with the findings of this study, it will be helpful to put in place the implementation of accident prognoses tests before employment in order to recognize and screen employees with higher natural tendencies in causing accidents. This might prevent such workers from doing critical jobs that trigger workplace accidents.
6. In promoting industrial safety practices, there is need for regular safety audits and accident reports checklist to serve as a reference point of safety management.
7. Workers' attitude causes most of workplace accidents, thus, it is very important to plan and design safety-training programmes that hinged upon work related attitudes in order to promote safe behaviours and change or transform negative attitudes on the job for a safer working environment.
8. Motivation and good staff remuneration have been discovered in this study to have impact on workers' attitude towards industrial safety practices. Based on this finding, company should adopt punishment and reward system in line with employee's patterns of behaviours so as to promote right attitude on the job.
9. Practice of periodic safety review meeting and evaluation of workers' behaviours should be maintained in industry in order to generate proper inputs for appropriate and effective industrial safety system.
10. Work related accidents reduce to the barest minimum levels when industrial safety programmes are measured and validated within social and cultural context. This practice stands to reveal some of the social and cultural elements required in industrial safety management.

### 5.3.1. Recommendations for Future Research

There are a lot to explore in this direction. Although this research primarily focused on attitude of workers towards industrial safety practices of companies in

Kaduna industrial area. However, other areas like socio-cultural factors of industrial safety where this study shows that none of the industrial workers sees any elements of industrial safety policies or programmes that are culturally-driven needed further research. These areas include:

i. Research should be carried on the influence of national culture towards industrial safety legislations. The result of this research will reveal the required elements of national culture needed in the safety policies.

ii. In a related area, research is also recommended on socio-cultural assessment of work-related accidents in Nigeria. Study of this nature will explore more socio-cultural causes of industrial accidents and give out details data of work-related accidents that are rarely reported in Nigeria.

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# APPENDIX A

Department of Sociology
Faculty of Social Sciences
Ahmadu Bello University
Zaria-Nigeria

Dear Respondent,

I am a student of Sociology Department, Ahmadu Bello University, Zaria carrying out a research titled: **Attitude of Workers Towards Industrial Safety Practices of Companies in Kaduna Industrial Area** as part of the requirement for the award of a degree of Master of Science (M.Sc.) in Sociology.

Through this study, the researcher hopes to develop methods and materials to improve workplace safety culture, job and industrial safety practices to reduce industrial accidents. The questionnaire will consume less of your time for administration because mostly it requires only ticking along the rate of five likert scale type.

The most advantageous time to administer the survey would be during a weekly safety meeting; or possibly a morning, lunch, or afternoon break. It would be best if I could be present to administer and clarify some issues you may find it difficult. Your help is greatly appreciated and if you have any questions during administration of questionnaire please do not hesitate to ask.

Your kind responses to attach questionnaire would be treated with utmost confidentiality and all personal and company privacy are assured.

Thank you.

Yours sincerely,

**Husseini Danlami**
Researcher

**QUESTIONNAIRE**
**ON**
**ATTITUTE OF WORKERS TOWARDS INDUSTRIAL SAFETY PRACTICES OF COMPANIES IN KADUNA INDUSTRIAL AREA**

**Section A**: Background Information

**Instruction:** Please tick the appropriate boxes provided.

1. Sex: a. Male ☐ b. female ☐
2. Age: a. 18-23yrs ☐ b. 24-29yrs ☐
   c. 30-34yrs ☐ d. 35 yrs above ☐
3. Marital Status: a. Married ☐ c. Divorced ☐
   b. Single ☐ d. Separated ☐
4. Highest Qualification: a. Primary Cert. ☐ b. SSCE ☐
   c. B.Sc/HND ☐ d. ND/OND ☐ Other, specify…
5. Years in service: a. 0-5yrs ☐ b. 6-14yrs ☐ c.15-24yrs ☐ d.25yrs above ☐

**Section B:** Sources and nature of industrial accidents.

**Instruction:** Please, indicate by ticking the appropriate rating on scale of 1-5 where 1 = Very Low (VL), and 5=Very High (VH).

**Note:** How do you rate the following sources and nature of industrial accidents in your Company?

Table 1: Sources and nature of industrial accidents.

| **S/N** | **Nature of industrial accidents** | **RATING** | | | | |
|---|---|---|---|---|---|---|
| | | VL 1 | L 2 | A 3 | H 4 | VH 5 |
| 1 | Accidents/injuries/bruises | | | | | |
| 2. | Lifting hazardous objects | | | | | |
| 3 | Chemicals hazards | | | | | |
| 4 | Infection/germs/disease | | | | | |
| 5 | Physical hazards | | | | | |
| 6 | Air pollution and noise | | | | | |
| 7 | Eye strain/skin problems | | | | | |
| 8 | Machinery/electrical faults | | | | | |
| 9 | Respiratory/cancer/lung problems | | | | | |
| 10 | Biological hazards | | | | | |
| 11 | Falling/tripping | | | | | |
| 12 | Ergonomic hazards | | | | | |
| 13 | Fatal injury/amputation | | | | | |
| 14 | Death | | | | | |
| 15 | Routine medical check | | | | | |
| 16 | Other specify…… | | | | | |

**Section C:** Accidents preventive measures in industry

**Instruction:** In this section, choose appropriate answer from the options below.

1. Are there provisions of safe premises, safe procedure, and safe machine for workers in the company?
    a. Strongly agree
    b. Agree
    c. Undecided
    d. Disagree
    e. Strongly disagree
2. How often do you put on Personal Protective Equipment (PPE) as accident preventive ethics?
    a. Very often
    b. Seldom
    c. Not Sure
    d. Not at all
    e. Regularly
3. How often do you attend training on the maintenance and uses of safety devices?
    a. Very often
    b. Seldom
    c. Not Sure
    c. Not at all
    d. Regularly
4. Replace or repair of all defective machines is seriously carried out in the company.
    a. Not serious at all
    b. Fairly serious
    c. Very serious
    d. Not very serious
5. Safety audits are regularly conducted in my company to check and report industrial accidents.
    a.Strongly agree
    b.Agree
    c.Undecided
    d.Disagree
    e.Strongly disagree
6. Is there well define policy guideline or safety precaution at the workplace ?
    a. Strongly agree  c. Undecided  e. Strongly Disagree
    b. Agree  d. Disagree
7. When fellow workers ignore safety procedure at workplace, I feel it is none of my business.
    a.Strongly Agree  b.Agree  c. Undecided
    d.Disagree  e. Strongly Disagree
8. Proper ventilation to avoid excessive heat or humidity is maintained in the company.
    a.Strongly agree  c. Undecided  e. Strongly Disagree
    b.Agree  d. Disagree

9. Others, specify:……..

**Section D:** Attitude of workers towards industrial safety.

**Instruction:** Please, indicate by ticking the appropriate rating on scale of 1-5 where 1 = Very Low (VL) and 5=Very High(VH)

**Note:** Please tick appropriately, how each of the following aspect of working life influence your attitude towards safety in workplace?

Table 2: Workers' Attitude towards industrial safety

| **S/N** | **Attitude of workers towards industrial safety** | **RATING** | | | | |
|---|---|---|---|---|---|---|
| | | VL 1 | L 2 | A 3 | H 4 | VH 5 |
| 1 | Workers behave safe when their Salary/allowance is enough. | | | | | |
| 2 | Passion for one job reduces unsafe behaviour. | | | | | |
| 3 | Co-workers often give tips to each other on how to work safety. | | | | | |
| 4 | Good Retirement Saving Plan (RSP) encourages right attitude towards industrial safety in order to enjoy retirement age. | | | | | |
| 5 | Job satisfaction/motivation encourages safe behaviour. | | | | | |
| 6 | The balance between work and home life promote industrial safety. | | | | | |
| 7 | Friendly working environment supports safe behaviour. | | | | | |
| 8 | I prefer to work safety even if it costs a lot. | | | | | |
| 9 | I am ready to take extra risk on my job so long as accident's compensation claims is better. | | | | | |
| 10 | Industrial strike departs workers from safe act. | | | | | |
| 11 | Religious intolerance promotes bad attitude on the job. | | | | | |
| 12 | It is always important to have good working relationship with my supervisor to promote industrial safety. | | | | | |
| 13 | The policy of my company does not encourage safe behaviour at workplace. | | | | | |
| 14 | Measurement of safety level in the industry attitudinal based. | | | | | |
| 15 | Other, specify:..... | | | | | |

**Section E:** Socio-cultural factors towards industrial safety.

**Instruction:** Please, indicate by ticking the appropriate rating on likert scale of 1-5 (1 = Agree (A), 2=Strongly Agree (SA), 3=Undecided (UD) 4=Disagree (D), 5=Strongly Disagree (SD)

**Note:** To what extent do you agree or disagree with the effect of the following socio-cultural factors towards promoting industrial safety?

**Table 3:** Socio-culrural factors towards industrial safety

| S/N | Socio-cultural factors towards industrial safety | RATING | | | | |
|---|---|---|---|---|---|---|
| | | A<br>1 | SA<br>2 | UD<br>3 | D<br>4 | SD<br>5 |
| 1 | Socio-cultural background of workers conforms with industrial safety rules at workplace | | | | | |
| 2 | Existing safety culture in the company influences my behaviour in workplace | | | | | |
| 3 | safety culture should encompasses social environment of workers | | | | | |
| 4 | Annual cultural festivity promotes industrial safety | | | | | |
| 5 | Safety rules are difficult to understand in my language | | | | | |
| 6 | Safety policy in my company does not encourage socio cultural support from workers | | | | | |
| 7 | Accident can happen to anyone regardless of one socio-cultural background | | | | | |
| 8 | Safety rules in my company are culturally driven. | | | | | |
| 9 | Other, specify:…….. | | | | | |

10.Suggest the possible ways of reducing industrial accident:……..
……
……
……
……
……
……
……
……...

## APPENDIX B

## IN-DEPTH INTERVIEW GUIDE FOR INDUSTRIAL WORKERS

1. What are the natures of industrial accidents in this industry?

    Probe:

    - Accidents/injuries/bruises
    - Faulty lifting/carrying/moving objects
    - Chemical hazards
    - Infection/germs/disease
    - Falling/tripping
    - Dirt, dust particles, and eye strain
    - Respiratory/cancer/lung problems
    - Machinery/electrical faults
    - Psychological/ergonomic hazards
    - Biological hazards
    - Amputation
    - Death.

2. How do you consider accident prevention measures in this company?

    Probe:

    - Industrial safety legislations
    - Availability of safety equipments
    - Personal Protective Equipments (PPE)
    - Commitment to safety regulation.

3. Can you please describe the attitude of workers towards industrial safety in this industry?

    Probe:

    - Salary/allowances
    - Job satisfaction/motivation
    - Passion for job
    - Workers management relationship
    - Religious intolerance
    - Job security
    - Friendly working environment

- Safety policy
- Team work
- The balance between work and home life.

4.What are the socio-cultural factors towards industrial safety in this industry?

Probe:

- Workers social environment
- Culturally based safety
- Complicated safety sign and symbol
- Background information of individual worker.

5.In your own opinion, what do you think should be done to address the poor safety attitude in work place?

Probe:

- Right attitude on the job
- Availability of safety equipments.

**APPENDIX C**

# Tables of Random Number

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 11164 | 36318 | 75061 | 37674 | 26320 | 75100 | 10431 | 20418 | 19228 | 91792 |
| 21215 | 91791 | 76831 | 58678 | 87054 | 31687 | 93205 | 43685 | 19732 | 08468 |
| 10438 | 44482 | 66558 | 37649 | 08882 | 90870 | 12462 | 41810 | 01806 | 02977 |
| 36792 | 26236 | 33266 | 66583 | 60881 | 97395 | 20461 | 36742 | 02852 | 50564 |
| 73944 | 04773 | 12032 | 51414 | 82384 | 38370 | 00249 | 80709 | 72605 | 67497 |
| 49563 | 12872 | 14063 | 93104 | 78483 | 72717 | 68714 | 18048 | 25005 | 04151 |
| 64208 | 48237 | 41701 | 73117 | 33242 | 42314 | 83049 | 21933 | 92813 | 04763 |
| 51486 | 72875 | 38605 | 29341 | 80749 | 80151 | 33835 | 52602 | 79147 | 08868 |
| 99756 | 26360 | 64516 | 17971 | 48478 | 09610 | 04638 | 17141 | 09227 | 10606 |
| 71325 | 55217 | 13015 | 72907 | 00431 | 45117 | 33827 | 92873 | 02953 | 85474 |
| 65285 | 97198 | 12138 | 53010 | 94601 | 15838 | 16805 | 61004 | 43516 | 17020 |
| 17264 | 57327 | 38224 | 29301 | 31381 | 38109 | 34976 | 65692 | 98566 | 29550 |
| 95639 | 99754 | 31199 | 92558 | 68368 | 04985 | 51092 | 37780 | 40261 | 14479 |
| 61555 | 76404 | 86210 | 11808 | 12841 | 45147 | 97438 | 60022 | 12645 | 62000 |
| 78137 | 98768 | 04689 | 87130 | 79225 | 08153 | 84967 | 64539 | 79493 | 74917 |
| 62490 | 99215 | 84987 | 28759 | 19177 | 14733 | 24550 | 28067 | 68894 | 38490 |
| 24216 | 63444 | 21283 | 07044 | 92729 | 37284 | 13211 | 37485 | 10415 | 36457 |
| 16975 | 95428 | 33226 | 55903 | 31605 | 43817 | 22250 | 03918 | 46999 | 98501 |
| 59138 | 39542 | 71168 | 57609 | 91510 | 77904 | 74244 | 50940 | 31553 | 62562 |
| 29478 | 59652 | 50414 | 31966 | 87912 | 87154 | 12944 | 49862 | 96566 | 48825 |
| 96155 | 95009 | 27429 | 72918 | 08457 | 78134 | 48407 | 26061 | 58754 | 05326 |
| 29621 | 66583 | 62966 | 12468 | 20245 | 14015 | 04014 | 35713 | 03980 | 03024 |
| 12639 | 75291 | 71020 | 17265 | 41598 | 64074 | 64629 | 63293 | 53307 | 48766 |
| 14544 | 37134 | 54714 | 02401 | 63228 | 26831 | 19386 | 15457 | 17999 | 18306 |
| 83403 | 88827 | 09834 | 11333 | 68431 | 31706 | 26652 | 04711 | 34593 | 22561 |
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