

OCCUPATIONAL SAFETY KNOWLEDGE AND PRACTICE AMONG EMPLOYEES IN FOUR TABLE WATER MANUFACTURING COMPANIES IN OBIO/ AKPOR LOCAL GOVERNMENT, RIVERS STATE, NIGERIA

BY

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IAUE/2019/HKH/MS/0009

M.SC OCCUPATIONAL HEALTH AND SAFETY STUDIES

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ABSTRACT

The aim of this study was to investigate the occupational safety knowledge and practices of employees in four table water manufacturing companies in Obio/Akor LGA of Rivers State. Eight research questions and six hypotheses were formulated to achieve the aim of the study. The study adopted a descriptive survey design with a population which consisted of all the 1001 employees. A proportionate random sampling technique was used to select a sample size of 517. The instrument for data collection was a structured questionnaire with a reliability index of 0.74. Data collected was analyzed using Statistical Package for Social Science (SPSS) version 20. Statistical tools such as frequency count, percentage, means, Pearson Correlation and ANOVA were used to analyze the data generated. The findings of the study showed that, about three quarter (74.5%) of the respondents had a good knowledge of occupational safety. Overall, about half 229 (50.25) of the respondents practice occupational safety always, 107 (23.5%) practiced occasionally, 63(13.8%) hardly while 57(12.5) never practiced occupational safety. The result further showed that the major occupational safety practice of the respondents was adherence to company's safety rules and regulations (80.7%), followed by report of workplace hazards and faulty equipment (77.2%), use of clothing like coverall or work uniform at work (76.8%), use of foot protection like safety shoes (75.0%), use of fall arrestors when working at height (71.3%), taking part in safety training (71.1%), use of respiratory protection like nose mask (69.5%), use of hand protectors like glove (68.0%) and eye protector like goggle (52.0%). The findings of this study showed a high relationship between knowledge and other variables such as education ($r=0.80$), age (-0.81) and years of working experience ($r=-0.75$). The result of the tested hypotheses on this revealed that factors such as education ($p<0.05$), age ($P<0.05$) and years of work experience ($P <0.05$) had a significant relationship with knowledge of occupational safety. Also, there was a statistically significant difference in occupational safety practice with respect to education ($p<0.00$), age ($p<0.05$) and years of work experience. It was concluded that, employees working in manufacturing companies have good knowledge and good practice of occupational safety. Therefore, management and safety specialists in manufacturing companies should continue comply with safety instructions and procedures given by their organizations. Professional safety organizations and trade unions should organize periodic workshops and training programs on safety to sustain the awareness of occupational safety relevant government departments and enforcement agencies should continue to sustain the regular monitoring and inspection of workplaces to ensure operations meet required safety standards and prescribed legal requirements.

KEYWORDS: Manufacturing companies, Occupational safety practices, Employees, Table Water.

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
AWARD OF DEGREE OF MASTER OF SCIENCE IN OCCUPATIONAL HEALTH AND SAFETY

STUDIES, DEPARTMENT OF HUMAN KINETICS, HEALTH AND SAFETY EDUCATION, FACULTY OF
NATURAL AND APPLIED SCIENCES

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MAY, 2021

DECLARATION

I **RIGHTEOUS, INNIME** declare that this dissertation on occupational safety knowledge and practices among employees in four manufacturing companies in Obio/Akor LGA of Rivers State, Nigeria was carried out by me; it is my original work and that it has not been submitted wholly or in parts for the award of degree in any institution.

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CERTIFICATION

IGNATIUS AJURU UNIVERSITY OF EDUCATION

POST GRADUATE SCHOOL

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IAUE/2019/HKH/MSC/0009

The board of Examiners certified that this Dissertation is accepted in partial fulfillment of the requirement for the degree of Master of Science (M.Sc) in occupational Health and Safety Studies.

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DEDICATION

This dissertation is dedicated to God Almighty: The Father, the Son and the Holy Spirit who made all things possible.

ACKNOWLEDGEMENT

The researcher’s profound gratitude goes to the project supervisor, Dr. Amadi, P.E. for his commitment to the work; from the beginning to the end and for his meticulous proof- reading of the work. The researcher’s appreciation also goes to the Head of Department of Human Kinetics Health and Safety Education Dr. Ekpo, G.E. and all the lecturers in the Department for their helpful assistance academically which resulted to the success of this work. I also appreciate the management and staff of El-Roi water company, Uniport Bottling Water, Aqua- Lez water company, Las-Sien and the numerous authors I gleaned their work during the course of my study.

I want to immensely appreciate my very lovely Mrs. Righteous, Glory Innime for her ever loving ways and support throughout the course of this work. I cannot forget my three adorable children: Eleli Oniso Righteous, Asuei Oniso Righteous and Ujo-Oniso Righteous for their love and understanding. To God be the Glory.

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CHAPTER 1 INTRODUCTION

1.1 Background of the Study

A good knowledge and practice of occupational safety will ensure a safe environment, a safe plant/equipment and a safe system of work which will lead to a workplace free of inquiries and all forms of accidents. According to the Rapid Results College (2015), occupational safety is the absence of danger of physical harm to people; freedom from those conditions that can cause death, injury, occupational illness, damage to loss of equipment or property, or damage to the equipment or property, or damage to the environment. The International Labour Organization (2013) reported that, more than 2.3 million workers die every year as a result of occupational accidents or work-related diseases. It stated that in addition, each year 313 million accidents occur on the job resulting in extended absences from work and that the annual cost to the global economy from accidents and work related diseases alone is a staggering \$3 trillion. As observed in a survey by Pika (2000), 81% of senior managers believed that occupational safety knowledge and practice had a significant effect on their organization's performance and reputation. In a case study carried out on companies in the North Eastern States of Nigeria, to evaluate the effect of industrial accidents in their productivity, Inegbenbor (1999), observed the performance records of companies over ten years' period. The result indicated that the production capacity of Ashaka Cement Plc declined by 18.56% because of accident. Also, Nigeria Bottling Company and Maiduguri Flour Mill had their production capacity declined by 16.67% and 40% respectively due to insufficient knowledge on how to manage the risks, workers become vulnerable to occupational hazards. Observing safe practices during manufacturing operation depends on appropriate attitude towards the associated risk factors which is dependent on the knowledge of the harmful effects of these chemicals (Chiabhlaem, 2015).

According to Maurer (2010), most research so far indicates that the age of a person, by itself, has little real meaning in explaining job practices. The author noted that other than the possibility that there may truly be no relationship between age and performance;

there are several possible reasons why there is no observed relationship between age and performance in research and that age is only a number that is very loosely associated with many other more meaningful (and potentially job-relevant) changes and differences in people. Much research remains to be done on this general issue.

The level of education has been shown to provide the appropriate skills needed to achieve social status and make healthy lifestyle choices; hence a high level of education increases the awareness of occupational safety (Adebola, 2014), Akintayo (2013) noted that, in Nigeria, little is known about occupational safety though the workers are exposed to many hazards and risks that could be detrimental to their safety and health. Bernandin (2007) stated that, employee performance is the record of result which is gained from the function of certain work or certain activities in certain period of time. It is a set of behaviours that are relevant to the goals of the organization or the organizational unit in which a person works). Abuga (2012) in a case study on the Effects of Occupational Health and Safety Programs on organizational Effectiveness found out that many of the firms that employed good occupational safety practices showed positive performance among the employees. According to him, knowledge, experience and educational status also had a positive and significant correlation with employee performance.

Occupational Safety is a multi-disciplinary field encompassing many disciplines and is concerned with the identification of work place hazards, assessment of the risk posed by the hazards, development of prevention controls or preventive measures to eliminate or reduce the possible effects of such hazards to as low as reasonably practicable. This is followed by the development of mitigations controls or recovery measure in case the prevention controls fail (Safeguard Safety and Management Center (SSMC), 2015). The field of occupational safety has become an integral part of every business, from the conception of the plan, to design, erection, operation and maintenance Occupational safety is now everyone's business, and basically involves both the management

and the employees and is concerned with cost reduction through the prevention injuries, illness, damage and loss (Bryan, 2012).

Gupta (2010) opined that the organized safety movement over the years developed in five stages. According to him, at the initial state Employers were concerned about the improvement of the environment and the removal of physical hazards. The second stage saw the improvement of personal practices through education, training and better organization of safety. In the third stage there was management direct involvement with the establishment of safety and health departments with specific roles to address safety and health issues. The fourth stage in the growth of the safety movement is the recognition of safety as part of management professionalism which must be implemented from the conceptual, planning, design, development and operational and maintenance stages of every industrial facility to guarantee not only effectiveness but also for higher productivity and higher profit. The fifth stage focused on cooperative effort amongst all stakeholders to develop industry codes and standards and to share safety critical information for the improvement of the safety, health and working condition of workers.

Occupational safety therefore is concerned with the identification of hazards, preventing them from causing incidents and ensuring that when incidents occur (i.e when our prevention controls fail) that recovery measures are in place to bring the incidents under control and prevent them from escalating. Every organization has a moral and legal obligation therefore to prevent injury of workers in order to cut cost, meet societal expectations for a safe workplace; and avoid pain, suffering, disability or loss of life employee. It is evident that if a good knowledge and practice of occupational safety is observed, it will help to improve employee' performance and overall productivity of an organization while controlling the possible effects of level of education, age and years of work experience of employees. This study therefore focused on the occupational safety knowledge and practice of employees in four table water manufacturing companies in Obio/Akpor in Rivers State.

By profession, healthcare workers (HCWs) attend to clients and patients through a variety of preventive and

curative services. However, while their attention is focused on providing care, they are vulnerable to hazards that could be detrimental to their health and well-being. This is especially true in developing countries where health service delivery is fraught with minimal protective precautions against exposures to numerous fomites and infectious agents. This study assessed the workplace hazards and safety practices by selected HCWs in a typical health care facility (HCF) in Nigeria. Methods: The study utilized a descriptive cross-sectional design and stratified sampling technique to identify 290 respondents. The study used mixed methodology and collected data by validated instruments with resulting data analyzed by IBM-SPSS, version 20. Results: The results showed that over half of the respondents were registered nurses, female, married (61.7 %) with 5 years median work experience (70.3 %). Most respondents (89 %) were knowledgeable about hazards in HCFs, identified recapping used needles as a risky practice (70 %) and recognized that effective hand washing prior to, and after every clinical procedure in preventing cross infection (100 %). Also, most respondents (96.2 %) believed they were at risk of occupational hazards while about two-thirds perceived the risk as high. In addition, only 64.2 and 87.2 % had completed Hepatitis B and Tetanus immunizations, respectively. Only 52.1 % "always" complied with standard procedures and most (93.8 %) practice safe disposal of sharps (93.8 %) while those that did not (40 %) generally implicated lack of basic safety equipment. In this study, the practice of hand washing by respondents was not influenced by occupation and education. Conclusions: The high level of knowledge demonstrated by respondents was at variance with practice, therefore, measures aimed at promoting safety practices and, minimizing exposure to hazards such as; provision of safety equipment, pre-placement and routine training of staff on safety practices and adequate reinforcement of staff capacity and capability through drills in all HCFs should be institutionalized and made mandatory. The protocol of the safety training and drills should be responsive to evidence-based emerging and sectoral safety challenges

Workers represent half of the world's population. Maintaining a safe working environment is reflected on a healthy worker. Some reasons for not

implementing the safety policy by most developing countries are lack of effective enforcement system, lack of information and accurate records of occupational diseases and accidents, and lack of basic professional training in occupational health and safety. Aim of Work: To assess a technical school students' knowledge, attitude, and practice toward the occupational health hazards. Changes in their knowledge were also measured before & after the health education session. Materials and Methods: A health education training session was done on fifty students in a technical education school in Abbasia district, Cairo. Their level of knowledge regarding occupational health was measured by means of a questionnaire distributed among them before and after the session. Results: Only 12.2 % of studied students have reported a previous training on occupational hazards. Thirty five students (71.4%) reported that their work require Personal Protective Equipments (PPEs), 63.3% of students reported that they are protective to their health in workplace and 61.2% prefer to wear them; however only 26.5 % were always wearing them. Only about half of students (51%) knew the correct definition of periodic medical examination. After the health education program, there was a statistically significant improvement in the knowledge of occupational law, proper management of chemical spill and knowledge of hazard of machinery noise. Conclusion: Technical school students require further training sessions to provide them with the knowledge needed to protect themselves & their working environment.

In times past, employers were not concern with the health and safety of their employees at work. An employee was not provided with safety and health equipment and s/he risked getting hurt at work anytime s/he goes about his/her duties. An injured employee in countries like U.S.for example had to litigate to obtain compensation which in most cases was not successful and the cost of doing so even prevented employees from going to court. However, the International Labour Organization made some recommendations in 1959 which provided that “occupational health services should be established in or near a place of employment for the purpose of: • Protecting the workers against any health hazards arising out of work or conditions in which it is carried on. • Contributing

towards workers physical and mental adjustment • Contributing to the establishment and maintenance of the highest possible degree of physical and mental well being of the workers. The employer has responsibility to protect the employees from all health hazards that may pose threat to their safety and health (International Labour Organization 1959). Safety hazards are those aspects of the work environment that have the potential of immediate and sometimes violent harm to an employee; for example loss of hearing, eyesight or body parts, arts, sprains, brushes, bruises, broken bones, burns and electric shock. xii In organizations, occupational accidents may arise from three dimensions: the task to be done, for instance malfunctioning machines, lack of protective equipment like working conditions which arise from inadequate lighting, fatigue that comes out of excessive working hours and the employee himself/herself. The Labour Act 2003, Act 651 of the Republic of Ghana, section 118(I) states that “it is the duty of an employer to ensure that every worker employed by him/her works under satisfactory, safe and healthy conditions. It is noteworthy mentioning that some organizations have placed responsibility for employee health and safety with their Chief Executive Officers. This approach is typical of smaller organizations with threats in this area or with mid-size organizations with few such threats. Large organizations seeing health and safety of their employees do set up safety departments usually under the purview of the human resource management team. For example, in the United States of America, a safety director should be appointed for every two thousand (2000) workers. In India, it is mandatory under the factories Act of 1948 to appoint safety officers in factories with a workforce of one thousand (1,000) or more. Government plays a significant part in health and safety because it legislates to improve health and safety factors. Trade unions have been more appreciative of health and safety measures than employees they represent. It is easy to see why this is so. The objectives of health and safety initiatives and trade unions both improve the quality of working life of employees. They pressurize employers for better programmes and use their clout to lobby for legislation to improve the health and safety of employees. On the other hand, socially responsible management had active health and safety programmes long before they

were made mandatory by law. Some others only complied because they were required to and that too only to meet the minimum requirements of the law. Quite apart from the willful avoidance of health measures, some employers face the dilemma of ignorance about the consequences of some dangerous working conditions. Furthermore, even where there is knowledge, prohibitive costs could prevent them from doing what is necessary, for example, uranium workers can expect that 10-11% of their numbers will die of cancer within 10 years. As long as there are no alternative methods and as long as there is a need for uranium, some employees will risk shorter lives in these jobs. That is although work is being done to determine the dangers and to prevent or mitigate the consequences of such works, the costs of some of these preventive programmes are so high that it would not be economically viable to adopt them. Employees today are central to achieving competitive advantages (Cascio, Wayne 1986). This reality has led to the need for health institutions and other organisations to link strategic goals and objectives in order to improve health service delivery and develop organizational cultures that foster innovation and flexibility. Health professionals need to be treated as crucial in meeting this aspiration. The key levers (including health and safety of people) of human resource management must be internally integrated with each other and externally integrated with the institution's strategy to enhance productivity and personal satisfaction. To be able to do this management has to focus on the immediate workplace, the adjacent communities, the regional environment and the international environment. xiv It must be noted that legislation and changed attitudes towards employees will make safety and health priority areas for organizations. In the organization's role of "managing bottom lines" they should realize that support and commitment to safety and health is ultimately cost effective. Typical health hazards to health professionals in their quest to provide healthcare services include toxic and carcinogenic chemicals and dust, often in combination with noise, heat and other forms of stress. Other health hazards include physical and biological agents. The interaction of health hazards and the human organisms can occur either through the senses, by absorption through the skin, by

intake into the digestive tract via the mouth or by inhalation into the lungs.

1.2 Statement of the Problem

Obio/Akpor local government area is known as the oil local government in Nigeria and so much emphasis is placed on the safety of the oil and gas industry with little attention to the manufacturing sector. Most enforcement action and research work are focused on the oil and gas industry where literature abound. Following this, manufacturing industries in Obio/Akpor are neglected in term of safety, and so have become increasingly accident prone. This development has led to many preventable temporary and permanent partial disabilities like dislocation/fractures and temporary and permanent total disabilities like amputation. Some workers are crushed to death when trapped between two moving part of a manufacturing machine or between one moving part and a fixed object due to lack of knowledge about workplace hazards. Workers also suffer cutting and severing of body parts from contact with moving sharp-edged machine part such as cutting tools as a result of poor work experience.

Workers wearing loose sleeve cuff or loose hair become entangled with rotating part of machine, sometimes they are drawn into manufacturing machines by two counter-rotating rollers as result of poor education in supervision of work processes. Some workers without adequate education also suffer eye, stabbing and puncture injuries while operating various machines. Younger workers are also known to record frequent accident due to inexperience. Non-compliance with standard safety practices is known to have caused many avoidable accidents in the manufacturing sector in Obio/Akpor leading to pain, suffering, disability, incapacity and loss of life. These accidents could attract enforcement action or civil/criminal prosecution leading to fines, imprisonment or shutdown of facility.

Accidents is known to lead to direct and indirect costs which could be insured or uninsured. The total direct and indirect costs associated with an accident in the workplace is considerable when compared to the cost of implementing good safety standards. Besides cost of hospitalization, damaged asset, legal fees, fines, compensations and investigation time; accident is also

known to result in loss of goodwill from workforce leading to the resignation of workers and high labour turnover; demoralization of workers leading to low productivity and loss of goodwill from customer and the community leading to poor business patronage or loss of corporate image or even total loss of business. These effects have high economic implications. It is in the light of the forgoing that his study becomes imperative to find lasting solutions to check the occupational safety knowledge and practices of employees' in four table water manufacturing companies in Obio/Akor LGA of Rivers State.

1.3 Aim and Objectives of the Study

The aim is to study the occupational safety knowledge and practice among employees in four table water manufacturing companies in Obio/Akor LGA. The specific objectives include to;

1. Determine the level of knowledge on occupational safety among employees in four table water manufacturing companies in Obio/Akpor LGA, Rivers State, Nigeria.
2. Identify the occupational safety practices among employees in four manufacturing table water companies in Obio/Akor LGA, Rivers State, Nigeria.
3. Determine the relationship between knowledge on occupational safety and the level of education of employees
4. Determine the relationship between knowledge on occupational safety and the age of employees.
5. Determine the relationship between knowledge on occupational safety and years of work experience of employees
6. Determine the mean difference in occupational safety practice of employees with respect to level of education.
7. Determine the mean difference in occupational safety practice of employees with respect to age.
8. Determine the mean difference in occupational safety practice of employees with respect to years of work experience.

1.4 Research Questions

For the purpose of the research, the following questions were answered.

1. What is the level of knowledge on occupational safety among employees in four table water manufacturing companies in Obio/Akor LGA, Rivers State, Nigeria?
2. What are the occupational safety practices among employees in four table water manufacturing companies in Obio/Akor LGA, Rivers State, Nigeria?
3. What is the relationship between knowledge on occupational safety and the level of education of employees?
4. What is the relationship between knowledge on occupational safety and the age of employees?
5. What is the relationship between knowledge on occupational safety and years of work experience of employees?
6. What is the mean difference in occupational safety practice of employees with respect to level of education?
7. What is the mean difference in occupational safety practice of employees with respect to age?
8. What is the mean difference in occupational safety practice of employees with respect to years of work experience?

1.5 Hypotheses

The following hypotheses postulated were tested at 0.05 level of significances

1. There is no significant relationship between knowledge on occupational safety and the level of education of employees.
2. There is no significant relationship between knowledge on occupational safety and the age of employees.
3. There is no significant relationship between knowledge on occupational safety and years of work experience of employees.
4. There is no significant difference in occupational safety practice of employees with respect to level of education.
5. There is no significant difference in the occupational safety practice of employees with respect to age.

6. There is no significant difference in occupational safety practice of employees with respect to years of work experience.

1.6 Significance of the Study

The study may provide works in the manufacturing sector with occupational safety knowledge and practices requirements of their jobs. The study may help workers identify the need to support management in the implementation of occupational safety programs. Workers involvement in the study may help raise awareness on occupational safety issues among them thereby improving their occupational safety practices.

The study may also help management to identify gap existing in the implementation of occupational safety programs and new strategies that can be adopted to improve safety practices of workers. Management may also know the relationship between occupational safety knowledge and practices with respect to the age, level of education and years of work experience of the employees. Useful recommendations in this study may help employers improve the occupational safety performance of their workplace.

Relevant government departments and enforcement agencies at the federal, state and local government level are expected to benefit immensely from the outcome of this research. The Factory inspectorate Division of the Federal Ministry of labour, Department

of petroleum Resources (DPR), National Environmental Standards and Regulations Enforcement Agency (NESRA), National Oil Spill Detection Agency and response Agency (NOSDRA), Federal Fire Service, State Fire Services among others stands to benefit from this research as it may guide their factory inspection and enforcement activities and provide them with information for policies and programme development in the manufacturing sector.

Finally, the findings and recommendation made in this study are expected to add to the existing body of knowledge in occupational safety. The result of the study is also expected to provide insights, guidance, information and data for future studies in the field of occupational Safety.

1.7 Scope of the Study

This study focused on occupational safety knowledge and practice among employees in four table water manufacturing companies in Obio/Akor LGA, Rivers State, Nigeria. The dependent variables of the study were knowledge and practice of occupational safety. The independent variables of interest include: age, level of education and years of work experience. The study was limited to four table water manufacturing companies in Obio/Akor LGA namely: El-Roi water, Uniport Bottling Water, La Sien and Aqua Lez

CHAPTER 2

REVIEW OF RELATED LITERATURE

The review of related literatures for the study is discussed under the following sub-headings:

- 2.1 Conceptual Framework
- 2.2 Empirical Review
- 2.3 Theoretical Framework
- 2.4 Appraisal of Reviewed literature

2.1 Conceptual Framework

The conceptual framework for this study is given under the following sub-headings:

- 2.1.1 Concept of Occupational Safety
- 2.1.2 Occupational Safety Knowledge and Practice
- 2.1.3 Occupational Safety practices among Employee
- 2.1.4 Occupational Safety Legislations in Nigeria
- 2.1.5 Definition of Common Occupational Safety Terms
- 2.1.6 Common Hazards and Descriptions

2.1.1 Concept of Occupational Safety

According to Alli (2008) occupational safety is generally defined as the science of the anticipation, recognition, evaluation and control of hazards arising in or from the workplace that could impair the health and well-being of workers, taking into account the possible impact on the surrounding communities and the general environment WHO (1995), defined occupational Safety and Health as a multi-disciplinary activity aiming at: protection and promotion of the health of workers by eliminating occupational factors and conditions hazardous to health and safety at work: enhancement of physical, mental and social well-being of workers and support for the development and maintenance of their working capacity, as well as professional and social development at work and development and promotion of sustainable work environments and work organizations. SSMC (2015), stated that occupational safety today is a multi-disciplinary field encompassing many disciplines (Chemistry, Physics, Biology, Medicine, Engineering, Education, Psychology, Sociology, law etc) and is

concerned with the identification of workplace hazards, assessment of the risk posed by the such hazards, development of prevention controls or preventive measures to eliminate or reduce the possible effects of such hazards to as low as reasonably practicable, and the development of mitigations controls or recovery measure in case the prevention controls fail.

Sikpa (2011), noted that the need to meet and exceed production targets, optimize resources and improve overall performance coupled with fast production processes as a result of the mechanization and automation of chains of production has made present-day industrial activities and operations complex. It was noted that, these development have introduced new industrial hazards leading to several accidents resulting in serious injuries, permanent disabilities, fatalities, industrial diseases, environmental pollution and sometimes; loss of asset and corporate image. Jain and Rao (2008), observed that present-day industries are becoming more and more complex because they have to meet the requirement of increased production rate, high efficiency and optimization.

According to Phukan (2016), in the twentieth century, as technology grew by leaps and bounds, associated hazards also grew with it which resulted in collective efforts and thinking in the direction of controlling work related hazards and accidents. Occupational safety as a field of study developed over the years majorly as a result of concern for the number of death and injuries recorded in various factories. The safety movement was initially driven by humanitarian concern by many organizations including trade unions coupled with protest by well-meaning citizens as a result of increasing accident rate which heightened calls for regulatory framework. The result is the enactment of legislations and development of standards for the purposes of improving the safety, health and welfare of workers. This however, did not address the problem appropriately due to the legal difficulties and challenges faced by injured workers and bereaved families in getting adequate compensation or make claim against employers of labour. Gupta (2010), stated that under the common

law system, employees did not automatically receive payments when injured on the job, as they do today. If employer could show any of four defences, he would not pay the injured employees for the injuries he suffered thus: the employee himself contributed to the cause of accident; another employee contributed to accident cause; the employee knew of hazards involved in the accident before his injury, and still agreed to work in the conditions; there was no employer negligence.

Today due to the foregoing anomaly, there is development and enactment of laws like the Factory Act, the Workman Compensation Act and many other regulations and standards for employers of labour and their employees which have prescribed penalties for offenders and compensation for injuries and fatalities. Gupta (2010), also observed that when management found itself in position by legislation of having to pay for injuries on the job, it decided that it would be financially better to stop injuries from happening.

The Cambridge Advanced Learner's Dictionary defines "welfare" as "well-being". Therefore, health and safety are strictly aspects of employee welfare, which have been separately identified as being significant areas of welfare provision for sometimes. Defines safety hazards as those aspects of the work environment that have the potential of immediate and sometimes violent harm to an employee; for example, loss of hearing, eye sight, or body parts, cuts, sprains, bruises, broken bones, burns and electric shock. Health hazards as those aspects of work environment that slowly and cumulatively (and often irreversibly) lead to deterioration of an employee's health; for example: cancer, poisoning and respiratory diseases. Typical causes include physical and biological hazards, toxic and carcinogenic dusts and chemicals and stressful working conditions (Cole, 1991)

In the late 19th and early 20th centuries, employers ran their businesses as they saw fit to make profit. Employee safety and health were not their concern. In fact, in official terms these things were nobody's concern. In the U.S. injured employees had to litigate to obtain compensation for their injuries. The cost of doing so effectively prevented employees from going to court. Besides, employees were rarely successful since, under common law, if the employee knew of the

hazards the job entailed or if the injuries were brought about as a result of the negligence of the employee or a co-worker, the employer was not liable. From these origins, there has emerged an approach and practice with regard to health, safety and welfare issues. The national safety council had been established in 1913 in the U.S. after safety conscious managers and engineers spearheaded its founding (major disasters led to changes in thinking). Significantly the international labour organization 1959, provided that occupational health services should be established in or near a place of employment for the employee welfare.(International Labour Organisation,1959)

2.1.2 Occupational Safety Knowledge and Practice

The task of identify hazards in workplace and determining suitable control measures and recovery measure will depend on the knowledge and experienced possessed by both employers and employees. Armstrong (2012), noted that achievement of a safe place of work and the elimination of maximum extent of possible hazards to health and safety has a relationship with the knowledge level of employees in an organization as well as those working under the contract. The occupational safety programs can be successfully implemented and designed to minimize the impact of work related accidents arising from the work by deploying a competent workforce with good training, knowledge and experience. According to Motbainor, Kumie and Melkamu (2007), due to insufficient knowledge on how to manage the risks, workers become vulnerable to occupational hazards. Observing safe practice during manufacturing operation depends on appropriate attitude towards the associated risk factors which is dependent on the knowledge of the harmful effects of these chemicals (Chiabhlaem, 2015).

From the view of Badelake (2012), Occupational Safety Practices refer to the occupational safety management system and safe work processes put in place for the control of hazards in a work place, Jelimo (2007), opined that occupational safety programs are the practices or activities that are undertaken by the organization in reducing unsafe conditions and unsafe acts in the workplace. Reducing unsafe conditions is

always an employer's first line of defense in accident prevention. He went on to state that in designing safe and healthy environments, employers need to pay special attention to vulnerable workers in the workplace either due to lack of education, ill-fitting personal protective equipment, physical limitation or cultural reasons.

Management will develop effective policy, define roles and responsibilities, make plan and adequate arrangement for safety and also implement it. Management is also expected to carry out regular evaluation through audit to know the effectiveness of the system and take action for improvement following audit. Employees are generally required to comply with safety rules and follow through the instructions, information and training provided by the employer including the appropriate used of safety equipment. In their observation Dorman, Quinlan and Wilthagen (2000), they stated that designing and implementing intervention programs is more challenging to larger organizations/or companies because of the difficulty in monitoring and evaluating the progress.

Safe workplace does not just happen; it has to be created. The organizations with the best reputation for safety have developed well-planned and thorough safety programs. Concern for safety should begin at the highest level within the organization, from directors/senior managers to the middle managers, the supervisors and down to the ordinary workers. If an organization takes effective safety measures, fewer of its employees may have to suffer injuries by reason of their job (Dessler, 2008).

Galler (2005), declared that organizations invest in safety programs not only as a humanitarian concern but also out of concern of controlling costs of doing business, meeting legal requirements and checking insurance premiums and loss of productive labour. Organizations also benefit from safe and healthy employees as some have been willing to invest for this purpose by setting up wellness programs and facilities. Werner (2009), stated that many interventions can be used to improve workplace safety and health. Among the most common are programmes designed to reduce accidents and injuries, reduce diseases, improve employees' ability to manage stress and overall health. While some of the interventions are intended to change

the lifestyles and non-work behaviours of employees. All these interventions can reduce the many costs associated with employee injuries, illness and death.

Wheatly (1995), noted that occupational safety practices are programmes that try discovering the causes of accidents and aiming at reducing the accidents. This is a continuous process of enhancing safety by minimizing the effects of accidents. According to Moos (1994), the heart of organizations safety programme is accident prevention. Occupational health and safety also encompasses all the people and programmes directly or indirectly involved in making the work environment safe. Occupational health and safety programs according to Makori (2008) play a great role in reduction of cost for the organization. To ensure a safe working environment there must be monitoring at the workplace. This involves systematic surveillance of the factors in the working environment and working practices which may affect workers' exposure to hazards (ILO, 2013).

The occupational safety policy represents the foundation for which occupational safety goals and performance measures and components are developed. This statement reflects the employer's commitment to safety and health at work, and should indicate the standard of behaviours that are to be aimed for in health and safety matters (Mberia, 2007). Written health and safety policies are required to demonstrate that top management is concerned about the protection of organizations employees from hazards at work and indicate how protection will be achieved. The policy statements should be a declaration of the intention of the employer to promote the safety of employees. The statement should describe the safety in the organization and the standards through which business is set and achieved by people at all levels of the company. The statement should underline the ultimate responsibility of top management for safety performance of the organization.

Safety Audits provide for a much more comprehensive review of all aspects safety policies, procedures and practices. Safety audits can be conducted by safety advisers and/or human resource specialists, but the more managers, employees and employee representatives are involved the better (Jackson 2000).

Cole and Nuemayer (2007) stated that, audits are often consulted/or carried out under the auspices of a health and safety committee with its members taking an active part in conducting them. Managers can also be held responsible for conducting audits within their departments and, even better, individual members of these departments can be trained to carry out audits in particular areas.

Safety Inspections are programmes designed to examine a specific area of the organization, an operational department or a manufacturing process to locate and define any faults in the system, equipment, plant or machines, or any operational errors that might be a danger to health or sources of accidents. Health and safety inspections should be carried out in a regular and systematic basis by line managers and supervisors with the advice of safety specialists. (Price, 2007).

Safety training is a key part of the preventive programme. Safety training is an essential element in maintaining a healthy and safe workplace and has been an integral component of occupational health and safety management. Training provides individuals with the basic theoretical and practical knowledge for the successful exercise of their trade or occupation and their integration into the working environment (Pretichand, 1990). Occupational safety training should meet the needs of the workers. Safety training spells out the rules and provides information on potential hazards and how to avoid them. The need to give appropriate training in occupational safety to workers and their representatives should thus be stressed as a fundamental element of occupational safety policy. Managers, supervisory staff and workers all need to be trained (Armstrong, 2012).

Safety Committee is another strategy in the management and control of workplace hazards and promotion of a safe workplace. Consultation of employees in matters of safety that concern them and cooperation between management and workers or their representatives at the workplace is an essential element in maintaining a safe workplace. Safety committees provide a valuable framework for discussion and for concerted action to improve safety and health (Dessler, 2013). The human resource department can serve as the coordinator of a committee composed of several

employee representatives. Where union exists, the committee should have union representation as well. Armstrong (2012), suggested that safety committee should help in conducting risk assessments and safety audits and make suggestions on improving safety performance. Employers should establish safety committees after consultation with trade union representatives and post a notice stating the composition of the committee and indicating what areas the organization will embrace. The overall objective of the safety committee is the promotion of cooperation between employers and employees in investigating, developing, and carrying out measures to ensure the safety of employee.

Provide and maintain at workplace, plant and system of work that are safe and without risk to health. • Ensure that safety and absence of risks of health in connection with use, handling, storage and transport of articles and substances. • Provide the necessary information, instructions, training and supervision having regard to the age, literacy level and other circumstances of the worker to ensure, so far as is reasonably practicable, the health and safety at work of those other workers engaged on the particular work. The Act again states that an employer who, without reasonable excuse, fails to discharge any of the obligations listed above commits an offence and is liable on summary conviction to fine not exceeding 1000 penalty units or to imprisonment for a term not exceeding three years or to both. In all Canadian jurisdictions, occupational health and safety law provides for government inspectors to periodically carry out safety inspections of workplaces. As in local scene, penalties consist of fines and / or jail terms. Canadian corporate executives and directors are held directly responsible for work place injuries.

2.1.3 Occupational Safety Practices among Employees

Stainer and Stainer (2000), viewed that the employee job performance can be affected by occupational safety practices in an organization. This implies that where there are poor safety practices, the employee's job performance also gets affected hence also affecting the overall organization performance. For instance, a workplace with uncontrolled safety hazards may lead to injury which would negatively affect the employee

job performance and organization performance. Stranks (2000), affirmed that workplace reality can be different because of perceptions that safety controls measures restrain operational freedom and inhibits productivity. However, effective performance strategies recognize the need to create a safe workplace where workers feel physically and psychologically safe to demonstrate that workers are valued.

Jelimo (2013) did a study on the effects of occupational health and safety practices on employee productivity. The study found out that there are occupational health and safety practices that have positive relationship with productivity of employees and include; fire prevention and protection, lighting and ventilation, personal protective equipment and good housekeeping, while chairs/tables and facilities for sitting, first aid kit and medical facility and drinking water and sanitary facilities had negative relationship. The study concluded that when an organization fully implements occupational safety practices, it improves employees' productivity. It was also realized that absence of occupational Health and Safety practices could easily result in absenteeism, high employee turnover, increased medical bill and insurance claim, injuries and frequent accidents. The study recommended continuous improvements of occupational health and safety practices as it greatly influences employee satisfaction, commitment, performance and productivity.

Regulations relating to safety representatives also include obligations regarding the establishment and operation of safety committees at the workplace. The overall objective of a safety committee is the promotion of co-operation between employers and employees in investigating, developing and carrying out measures to ensure the health and safety of the employees at work. Cole.(2002) identifies key functions of safety committees. These include:

- Studying trends in accidents, etc, with the view to making suggestions for corrective actions.
- Examining safety reports and making proposals for avoiding accidents, etc.
- Examining and discussing reports from safety representatives.

- Making proposals for new or revised safety procedures

- Acting as a link between the organization and the enforcement agency (the health and safety inspectorate).

- Monitoring and evaluating the organization's safety policies, and making proposals for changes, it necessary. Michael.(2006) also states that employees frequently participate in safety planning through safety committees, often composed of workers from a variety of levels and departments. A safety committee generally meets at regular scheduled times and has specific responsibilities xxv for conducting safety reviews, and makes recommendations for changes necessary to avoid future accidents.

Today, employees expect their employers to provide work environments that are safe, secure and healthy. However, many employers once viewed accidents and occupational diseases as unavoidable by-products of work. This idea may still be prevalent in many industrial settings in underdeveloped countries. Fortunately in most developed nations, this idea has been replaced with the concept of using prevention and control to minimize or eliminate risks in workplaces. But in many underdeveloped countries significant health, safety concerns exist in workplaces. Health refers to a general state of physical, mental and emotional well-being (Robert and John, 2004). A healthy person is free of illness, injury or mental and emotional problems that impair normal human activity. Health management practices in organizations strive to maintain the overall well-being of individuals. Safety on the other hand refers to protecting the physical well-being of people (Robert and John, 2004). The main purpose of effective safety programmes in organizations is to prevent work related injuries and accidents. The purpose of security is to protect employees and organizational facilities. The general goal of providing a safe, secure and healthy workplace is reached when there is cooperation between managers and HR staff members. An HR manager or safety specialist xxvi can help coordinate health and safety programmes, investigate accidents, produce safety programme materials and conduct formal safety training. However, department supervisors and managers play key roles in maintaining safe working

conditions and a healthy workplace. For example, a supervisor in a warehouse has several health and safety responsibilities: reminding employees to wear safety hats; checking on the cleanliness of the work area; observing employees for any alcohol, drug or emotional problems that may affect their work behavior; and recommending equipment changes (such as screens, railings or other safety devices) to engineering specialists in the organization. A position becoming more common in many companies is that of safety/environmental officer. This combination may make sense in situations where danger results from chemical or other sources of pollution that may be hazardous to both employees and the public or the environment. Regarding security, HR managers and specialists can coordinate their efforts with those in other operating areas to develop access restrictions and employee identification procedures, contract or manage organizational security services such as guards and train all managers and supervisors to handle potentially volatile situations.

2.1.4 Occupational Safety legislations in Nigeria

Occupational Safety legislations developed over the years as part of government response to increasing complaints, protest, industrial unrest, community restiveness and business interruptions as result of injuries or death of worker, community wellbeing or damage to the environment. This is coupled with the mechanization and automation of chains of production which introduced new occupational hazard and concern for occupational health, safety and environment. Industrialization brought about new and fast production process but also introduced new industrial hazards leading to several accidents resulting in serious injuries, permanent disabilities and fatalities. The challenges faced by injured workers and bereaved families in getting adequate compensation or make claim against employers of labour coupled with the le.g.al difficulties and protect by well-meaning citizens heightened need for Occupational Health and Safety legislations regulations. The result is the enactment of legislations and setting of Factories inspectorate Division responsible for enforcing these laws. A good understanding of existing legislations and applicable standards as it concerns individual businesses is vital to ensure compliance by developing safe system of

work in line with regulatory requirements and standards (SSMC, 2015).

Compliance with regulatory requirements is a good business that requires knowledge of these legislations, in addition to management leadership commitment, Legislations are enacted for business owners and employers of labour to guarantee safety, health and welfare of employees. It is also to ensure community safety and wellbeing, the protection of the environment, asset, and for business continuity. Business organizations are expected to comply with these legislations by developing Safe System of Work (SSMC, 2015)

Robert and John.(2004) state that at the heart of safety management is an organizational commitment to a comprehensive safety effort. This effort should be coordinated from the top level of management to include all members of the organization. It should also be reflected in managerial actions. Employers can prevent some accidents by having machines, equipment and work areas so that workers who daydream periodically or who perform potentially dangerous jobs cannot injure themselves or others. Providing safety equipment and guards on machinery, installing emergency switches, installing adequate ventilation, installing emergency switches, installing safety rails, keeping aisles clear, lighting, heating and air conditioning can all help make work environment safer. Designing jobs properly requires consideration of physical setting of a job. The way the work space surrounding a job is utilized can influence the worker's performance of the job itself. Several factors that affect safety have been identified; including size of work area, kinds of materials used, sensory conditions, distance between work areas, and interference from noise and traffic flow. Designing safety policies and rules and disciplining violators are important components of safety efforts. Frequently reinforcing the xxviii need for safe behavior and supplying feedback on positive safety practices also are effective in improving worker safety. Such efforts must involve employees, supervisors and managers

ILO Conention, Protocols and Recommendations: International Labour Organisation (ILO) is an agency of the United Nations, most countries are members. The ILO sets international standards for Health and

Safety by publishing Conventions, protocols and recommendations which rectified and adopted by national governments. In 1981, the ILO adopted the Occupational Health and Safety Convention (CI 55). This sets forth a basic goal-setting policy for health and safety at both the national level and the level of the individual undertaking. C155 is complemented by P155-the Protocol to the Occupational Health and Safety Convention 1981-which fleshes out some of provisions regarding reporting of occupational accidents etc to national authorities. The Occupational Safety and Health Recommendation 1981 (R164) supplements (155 and provides more detailed guidance on how to comply with the policies of C155. In particular, it identifies obligations that might be placed on employers and workers in order to achieve the basic goal of a safe and healthy place of work. These basic ideas are widely enshrined in national legislation (ILO, 1981).

Factories Act 2004 (As Amended): The act provided legislative framework to promote, stimulate and encourage high standards of health, safety and welfare in industrial establishments. The Factories Act promotes the safety of workers and professional exposed to occupational hazards. Under this Act, it is an offence to use unregistered premises for factory purposes. In particular: Section 13 allows an inspector take emergency measures or request that emergency measures be taken by a person qualified to do so in cases of pollution or any nuisance. The Act has the following aims: secure the health, safety and welfare of person at work; protect persons, other than persons at work, against risk to health or safety arising out of or in connection with the activities of persons at work; involve everyone, both management and employees, and make them all aware of the importance of safety and health.

The Factories Act has eleven parts: Part I-Registration of Factories; Part II- Health (General Provisions); Part III-Safety (General Provisions); Part IV-Welfare (General Provisions); Part V- Health, Safety and Welfare (Special Provisions and Regulations); Part VI-Notification and Investigation of Accidents and Industrial Diseases, Part VII- Special Application, Extension and Miscellaneous Provisions; Part VIII-General Register; Part IX Administration; Part X-

Offences, Penalties and Le.g.al Proceedings; Part XI-General. The Factory Act is administered by the Federal Ministry of Labour and Employment through the Factories Inspectorate Division (Factory Act, 2004).

Employee Compensation Act 2010: Workmen's Compensation Act Cap. W 6 laws of the Federation of Nigeria, 2004 (Now repealed by the Employee Compensation Act 2010). This Act has placed increased responsibility and liabilities on business owners and employers of labour to guarantee safety, health and welfare of employees. Business owner and employers of labour are now required to pay adequate compensation to injured workers and the families of bereaved workers. These increased responsibility and safety. The Act makes comprehensive provisions for payment of compensation to employees who suffer from occupational diseases or sustain injuries arising from accident at workplace or in the course of employment. The Act applies to all employers and employees in the public and private sectors in the Federal Republic of Nigeria except for any member of the armed forces of the Federal Republic of Nigeria other than a person employed in a civilian capacity. The Act also provides that the Nigeria Social Insurance Trust Fund Management shall have power to implement the Act and Employees' Compensation Fund (into which shall be credited all moneys, funds or contributions by employers for adequate compensation to employees or their dependants for any death, injury, disability or disease arising out of or in the course of employment) (Employee Compensation Act 2010).

Wayne,Cacio(1992) states that employers frequently complain that there is no systematic method of quantifying costs and benefits when dealing with employees' safety and health conditions. Technically that is true, but there is a behavior costing model that may provide a xxx useful start. It is important to distinguish nondiscretionary from discretionary safety and health expenditures. Some states and local agencies require firms to comply with safety and health regulations. To comply, firms may have to purchase and install special equipment, such as machine guards, safety switch interlocks, and non slip flooring. These costs are nondiscretionary. To do otherwise is to risk heavy fines and losses from

liability and damage suits. Cacio, Wayne. (1992) again emphasized that, beyond mere compliance, however, companies have a number of options regarding the degree to which they invest in employee safety and health. A motivational poster programme (e.g. “think safety”) is a token effort that requires minimal expenses. Creation of a safety committee to encourage active employee complaints is more expensive. The highest-cost option includes regular safety training for all employees. The training may involve films, lectures by safety experts or hands-on drills and demonstrations with safety and emergency apparatus. Boyd. (2003) states that for each of these levels of safety and health programmes, investment costs are measurable. They include the salaries and wages of employees participating in the programme, the costs of outside services used and the costs to implement the programmes. Unfortunately, the benefits to be derived from such programmes cannot be traced as easily to the bottom line. Certainly, the most quantifiable benefit resulting from the successful introduction of a safety and health programme is a reduction in casualty and workers’ compensation insurance rates. Less measurable benefits involve the avoidance of the “indirect “cost of an accident, including;

- cost of wages paid for time lost
- cost of damage to material or equipment
- cost of overtime work required by the accident xxxi
- cost of wages paid to supervisors while time is required for activities resulting from the accident
 - costs of decreased output of the injured worker after she or he returns to work
- Unsuured medical costs borne by the company
- Cost of time spent by higher management and clerical workers to investigate or to process worker’s compensation forms.
- Costs associated with the time it takes for a new worker to learn the job.
- Cost of labour spent on the employee engaged to replace the injured Prediction of these costs and identification of trends in them is very difficult. It must be done on the basis of historical information (to gauge trend) and judgment by managers (to assess the seriousness of the accidents avoided). This makes

economic sense for firms to ensure that there should be no limit to efforts to eliminate accidents and health hazards.

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SAFETY TRAINING AND COMMUNICATION

Tsui and Gomez-Mejia. (1988) state that one way to encourage employee safety is to involve all employees at various times in safety training. Safety training can be done in various ways. This includes;

- Regular sessions with supervisors, managers, and employees often are coordinated by HR staff members.
- Showing videos, television broadcasts and internet-based resources all are means used to conduct safety training. To reinforce safety training, continuous communication to develop safety consciousness is necessary. Merely sending safety memos is not enough. Producing newsletters, changing safety posters, continually updating bulletin boards and posting information in visible areas also are recommended. (Tsui and Gomez-Mejia. 1988)

EMPLOYEE SAFETY MOTIVATION AND INCENTIVES

Michael (2006) states that to encourage employees to work safely, many

organizations have used safety contests and have given employees incentives for safe work behavior. Jewellery, clocks, watches and even vacation trips have been given as rewards for good safety records. Unfortunately, some evidence indicates that incentives tend to reinforce understanding and “creative” classifying of accidents. This concern about safety incentives is that employees and managers do not report accidents and injuries so that they may collect the incentive rewards.

INSPECTION, ACCIDENTS INVESTIGATION AND EVALUATION It is not necessary to wait to inspect the work area for safety hazards. Inspections may be done by a safety committee or by a safety coordinator. They must be done on a regular basis. Eva and Oswald (1981) emphasize that when accidents occur, they should be investigated by the employer’s safety committee. Investigation at the scene should be done as soon as possible after an accident to ensure that the conditions under which the accident occurred have not changed significantly. The second phase of investigation is the interview of the injured employee, his or her supervisor and witnesses to the accident. This is followed by recommendations .Organization should monitor and evaluate their safety efforts. Just as organizational accounting records are audited, a firm’s safety efforts and records should be audited periodically as well.

THE COSTS AND BENEFITS OF OCCUPATIONAL HEALTH AND SAFETY PROGRAMMES Wayne,Cacio(1992) states that employers frequently complain that there is no systematic method of quantifying costs and benefits when dealing with employees’ safety and health conditions. Technically that is true, but there is a behavior costing model that may provide a xxx useful start. It is important to distinguish nondiscretionary from discretionary safety and health expenditures. Some states and local agencies require firms to comply with safety and health regulations. To comply, firms may have to purchase and install special equipment, such as machine guards, safety switch interlocks, and non-slip flooring. These costs are nondiscretionary. To do otherwise is to risk heavy fines and losses from liability and damage suits. Cacio, Wayne.(1992) again emphasized that, beyond mere compliance, however,

companies have a number of options regarding the degree to which they invest in employee safety and health. A motivational poster programme (e.g. “think safety”) is a token effort that requires minimal expenses. Creation of a safety committee to encourage active employee complaints is more expensive. The highest-cost option includes regular safety training for all employees. The training may involve films, lectures by safety experts or hands-on drills and demonstrations with safety and emergency apparatus. Boyd.(2003) states that for each of these levels of safety and health programmes, investment costs are measurable. They include the salaries and wages of employees participating in the programme, the costs of outside services used and the costs to implement the programmes. Unfortunately, the benefits to be derived from such programmes cannot be traced as easily to the bottom line. Certainly, the most quantifiable benefit resulting from the successful introduction of a safety and health programme is a reduction in casualty and workers’ compensation insurance rates. Less measurable benefits involve the avoidance of the “indirect “cost of an accident, including, cost of wages paid for time lost , cost of damage to material or equipment ,cost of overtime work required by the accident, cost of wages paid to supervisors while time is required for activities resulting from the accident, costs of decreased output of the injured worker after she or he returns to work, Unsuured medical costs borne by the company, Cost of time spent by higher management and clerical workers to investigate or to process worker’s compensation forms, Costs associated with the time it takes for a new worker to learn the job, Cost of labour spent on the employee engaged to replace the injured Prediction of these costs and identification of trends in them is very difficult. It must be done on the basis of historical information (to gauge trend) and judgment by managers (to assess the seriousness of the accidents avoided).This makes economic sense for firms to ensure that there should be no limit to efforts to eliminate accidents and health hazards.

ORGANISATIONAL SAFETY AND HEALTH PROGRAMMES. Pirani and Reynolds.(1976) indicate that accidents results from two broad causes: unsafe work condition (physical and environmental) and unsafe work behavior .Unsafe physical conditions

include defective equipment, inadequate machine guards, and lack of protective equipment. Examples of unsafe environmental conditions are noise, radiation, dust, fumes, and stress. Accidents often result from an interaction of unsafe acts. Thus if a particular operation forces a worker to lift a heavy part and twist to set it on a bench, then the operation itself forces the worker to perform the unsafe act. Telling the worker not to lift and twist at the same time will not solve the problem. The unsafe condition itself must be corrected, xxxii either by redesigning the flow of material or by providing the worker with a mechanical device for lifting. Engineering controls attempt to eliminate unsafe work conditions and to neutralize unsafe worker behaviors. Management controls attempt to increase safe behaviors. Engineering controls involve some modification of the work environment; for example, installing a metal cover over the blades of a lawnmower to make it almost impossible for a member of a grounds crew to catch his or her foot in the blade.

PROMOTING JOB SAFETY & HEALTH Cacio, Wayne. (1992) outline four approaches in promoting job safety and health. These are;

- Technical responses-this involves replacing or redesigning equipment, modifying physical work places and providing worker protection (engineering controls).
- Information responses-which refers to changes in the way that health and safety information is transmitted within the organization.
- Administrative responses include changes in the authority structure or in policies and procedures with respect to safety and health (e.g. upgrading the safety function and shifting it from engineering to the human resource department)
- External responses refer to legal or political actions to change the enforcement of safety and health regulations. Byars and Rue (2008) suggest the following as things which can be done to promote safety and health of the organization. These include; xxxiii a) Making the work interesting Uninteresting work often leads to boredom, fatigue and stress, all of which can cause accidents. Often simple changes can be made to make the work more meaningful. Attempts to make the job interesting are usually successful if

they add responsibility, challenge, and other similar factors that increase employee's satisfaction with the job. b) Establishing a safety committee composed of operative employees and representatives of management. The safety committee provides a means of getting employees directly involved in the operation of the safety programmes. c) Feature employees' safety contests Give prizes to the work groups or employees having the best safety record for a given time period. Contests can also be held to test safety knowledge. Prizes can be awarded periodically to employees who submit good accident prevention ideas. d) Publicize safety statistics Monthly accidents reports should be posted. Ideas as to how accidents can be avoided should be solicited. e) Use bulletins boards throughout the organization. Pictures, sketches, and cartoons can be effective. f) Encourage employees including supervisors and managers to have high expectations for safety. g) Periodically hold safety training programmes and meetings. Have employees attend and participate in these meetings as role players or instructors.

2.18 EMPLOYEE ASSISTANCE PROGRAMME Mills, Quin. (1983) state that until recently, organizations attempted to avoid employees' problems that were not job related. Although aware of the existence of these problems, most managers did not believe they should interfere with employees' personal lives. In the past, organizations tended to get rid of troubled employees. In recent years, however, cost considerations, unions and government legislation altered this approach. The accepted viewpoint now is that employees' personal problems are private until they begin affecting the job performance. When and if that happens, personal problems become a matter of concern for the organization. As a result of this, many large organizations and a growing number of smaller ones are attempting to help employees with personal problems. These problems include not only alcohol and drug abuse but depression, anxiety, domestic trauma, financial problems, and other psychiatric/medical problems. This help is not purely altruistic; it is largely based on cost savings.

COST OF PERSONAL PROBLEMS A primary result of personal problems brought to the workplace is reduced productivity. Absenteeism and tardiness also

tend to increase. Increased cost of insurance programmes, including sickness and accident benefits, are a direct result of personal problems brought to workplace. Lower morale, more friction among employees, and more grievances also result from troubled employees. Permanent loss of trained employees due to disability, retirement and death is also associated with troubled employees. Difficult to measure, but a very real cost associated with troubled employees, is the loss of business and a damaged public image (Litwin and Stringer, 1968).

MAINTAINING A HEALTHY WORK ENVIRONMENT David, and Stephen. (1999) indicate that unhealthy work environment is a concern to us all. If workers cannot function properly at their jobs because of constant headaches, watering eyes, breathing difficulties, or fear of exposure to materials that may cause long term health problems, productivity will decrease. Consequently, creating a healthy work environment not only is the proper thing to do, but it also benefits the employer. Often referred to as sick buildings, office environments that contain harmful airborne chemicals, asbestos, or indoor pollution (possibly caused by smoking) have forced employers to take drastic steps. For many, it has meant the removal of asbestos from their buildings. Palmer.(1989) makes suggestions for keeping the workplace healthy. These include

- making sure workers get enough fresh air. The cost of providing it is peanuts compared with the expense of cleaning up a problem.
- avoiding suspected building materials and furnishing. A general rule is that if it stinks, it is going to emit an odour.
- Testing new buildings for toxins before occupancy. Failure to do so may lead to potential health problems.
- Providing a smoke-free environment. If you do not want to ban smoking entirely, then establish an area for a smoker that has its own ventilation.
- Keeping air ducts clean and dry. Water in air ducts is a fertile breeding ground for fungi. Servicing the air ducts periodically can help eliminate the fungi before they cause harm.

- Paying attention to workers' complaints. Dates and particulars should be recorded by a designated employee. Because employees are often closest to the problems, they are a valuable source of information

OCCUPATIONAL DISEASES/ACCIDENTS

Occupational disease is any illness associated with a particular occupation or industry. Such diseases result from a variety of biological, chemical, physical, and psychological factors that are present in the work environment or are otherwise encountered in the course of employment. Occupational medicine is concerned with the effect of all kinds of work on health and the effect of health on a worker's ability and efficiency. Occupational diseases are essentially preventable and can be ascribed to faulty working conditions. The control of occupational health hazards decreases the incidence of work related diseases and accidents and improves the health and morale of the work force, leading to decreased absenteeism and increased worker efficiency. In most cases the moral and economic benefits far outweigh the costs of eliminating occupational hazards.(Encyclopedia Britannica, 2009) 2.22

AIMS AND FUNCTIONS OF OCCUPATIONAL HEALTH SERVICES. The primary concerns of occupational health services remain those specified by the International Labour Organisation/World Health Organisation in 1950, although work-related diseases are now considered as well as purely occupational diseases. The actual services offered are essentially preventive in nature and are summarized below:

- a)Job placement-People with certain preexisting medical conditions may be at a disadvantage in some jobs. A pre-employment health questionnaire or medical examination can be of great value in such cases by determining job unsuitability before training time and expense have been incurred. Job suitability may also need to be regularly monitored in order to assure employee health and ability. Airline pilots, for example, undergo regular medical checkups because a pilot with failing vision or one who suffers from an undetected heart condition that can lead to a heart attack could endanger many lives. The health service can also give valuable advice with regard to alternative employment when a worker is found to be unfit for a particular job.

b) Safety training-An occupational health service has a responsibility to keep all employees informed about hazards in the workplace. The measures taken to protect employee health should be thoroughly explained so that workers understand the necessity of complying with xxxviii such unpleasant restrictions as the wearing of protective clothing and face masks. First aid facilities should be organized and employees instructed about first aid procedures in case of accidental injuries or other emergencies. c) Supervision of high-risk groups-Exposure levels considered safe for a young male worker may be hazardous for a pregnant woman (the fetus, especially during the first three months of development, is particularly sensitive to environmental toxic agents). Pregnant women, as well as such other vulnerable groups as the very young, the elderly, and the disabled, therefore require appropriate medical surveillance and advice about specific precautionary measures they can take. d) Control of recognized hazards-A complex system of environmental and biological monitoring has been developed for the control of known hazards at work. Occupational health practice is concerned with monitoring the concentration of toxic substances in the environment, determining safe exposure levels, suggesting procedures to limit worker exposure, and monitoring workers for signs of overexposure. Occupational health specialists can also contribute to the prevention of health risks by assisting in the planning and design of new equipment and factories. e) Identification of unrecognized hazards-Occupational health services can play a major role in the detection of new health hazards of all types. Clinical observation and study may reveal a causal relationship between patterns of sickness or mortality in groups of workers and their occupational exposure. Examples of hazards identified in this manner include lung and nasal cancer among nickel workers, lung cancer in asbestos workers, and coronary heart disease among workers exposed to carbon disulfide (used in the manufacture of rayon Treatment-Quick, on-site treatment of work injuries and poisonings can prevent complications and aid recovery. Such treatment can also be economically beneficial by saving traveling and waiting time. Furthermore, physicians and nurses who are unfamiliar with their patients' working conditions may keep workers with minor injuries away from work longer

than necessary. An occupational treatment service offers opportunities for specialized counseling and health education. h) General health education and surveillance-Occupational health services may have to provide general medical care for workers and their families in developing countries with inadequate community health services. Even when general health care is provided elsewhere, an occupational health service can offer an effective and often economically advantageous program of health education and counseling. By advising employees on such topics as smoking, alcohol or drug abuse, exercise, and diet, the occupational health service can improve worker health and efficiency and reduce illness and absenteeism. The health service is also in a position to organize employee health surveillance programmes for the early diagnosis of disease. (Encyclopedia Britannica. 2009)

Petroleum Act 2004: The Petroleum Act 2004 and its Regulations remain the primary legislation on oil and gas activities in Nigeria. It promotes public safety and environmental protection. The following sections are relevant: Section 9 (1) (b) provides authority to make regulations on operations for the prevention of air and water pollution. One the regulation under the Petroleum Act is the Petroleum Drilling and Production Regulations. Section 17 (1) (b) places restrictions on licensees from using land within fifty yards of any building, dam, reservoir, public road, etc. section 23 and 27 prohibits, without lawful permission, the cut down of trees in forest reserves. Section 25 establishes that reasonable measures be taken to prevent water pollution and to end it, if it occurs.

Another regulation under the Petroleum Act is Petroleum Refining Regulation: the regulations prescribed safety requirements, good refining practice, restriction of refining areas, restriction of vehicular movement for refineries and Provision for safety clothing and appliances, machine guarding, training, safe work procedure and emergency procedure. Section 43 (3) requires the Manager of a refinery to take measures to prevent and control pollution of the environment. Section 45 makes any contravention punishable with a fine of N100,000.00 or an imprisonment term of six months. This regulation is administered by the Federal Ministry Petroleum through the Department of Petroleum Resources

(DPR) of the Nigerian National petroleum Corporation (NNPC). Crude Oil Transportation and Shipment Regulations is also one of the regulations under the Petroleum Act: these Regulation prescribe precautions to be taken in the production, loading, transfer and storage of petroleum products to prevent environmental pollution. We also have Mineral Oil (Safety) Regulation. This is a section of the Petroleum Act due to the hazards associated with the operation of the petroleum industry. Prescribes standard safety measures and imposes duties relating to safety of operations on holders of Oil Exploration Licenses (OELs), Oil Prospecting licenses (OPLs) and Oil Mining Leases (OMLs). It provides for safety relating to petroleum exploration and production activities with five parts. The regulation is administered by the Federal Ministry of Petroleum through the Department of petroleum Resources (DPR) of the Nigeria National Petroleum Corporation (NNPC). It provides for safety relating to petroleum exploration and production activities with five part I-Duties of Licensees and lessees; Part II- Duties of Managers; Part III- Duties of Employers; Part VI-Diving Operations; Responsibilities & Requirements and PartV-Miscellaneous. The regulation is administered by the Federal Ministry of Petroleum through the Department of Petroleum Resources (DPR) of the Nigerian National Petroleum Corporation (NNPC). The Petroleum Regulation yet another regulation under the Petroleum Act provided for safety measures for importation, shipping, unshipping and landing of petroleum, storage of petroleum. Is also provided for transport of petroleum, open air storage of petroleum, transport of petroleum bulk on federal trunk roads and other roads, liquefied petroleum gasses; and fuelling of air craft. The regulation is administered by the Federal Petroleum through the Department of Petroleum Resources (DPR) of the Nigerian National Petroleum Corporation (NNPC) (Petroleum Act, 2004).

Environment Standards and Regulation Enforcement Agency (NESREA) Act 2007: The National Environment Standards and Regulation Enforcement Agency (NESREA) Act of 2007 replaced the Federal Environmental Protection Agency (FEPA) Act. It is the embodiment of laws and regulations focused on the protection and sustainable development of the environment and its natural resources. Section 7

provides authority to ensure compliance with environmental laws, local and international, on environmental sanitation and pollution prevention and control through monitory and regulatory measures. Section 8 (1) (K) empowers the Agency to make and review regulations on air and water quality, effluent limitations, control of harmful substances and other forms of environmental pollution and sanitation. Section 27 prohibits, without lawful authority, the discharge of hazardous substances into the environment. This offence is punishable under this section, with a fine not exceeding, N1,000,000 (one Million Naira) and an imprisonment term of 5 years. In the case of company, there is an additional fine of N50,000, for every day the offence persists (NESREA ACT, 2007).

National Oil Spill Detection and Response Agency (NOSDRA) Act 2002: The act established the National Oil Spill Detection and Response Agency with responsibility for preparedness, detection and response to all oil spillages in Nigeria. It also established the advisory, monitoring, evaluating, mediating and coordinating arm of NOSDRA known as the National Control and Response Centre (NCRCO). The NOSDRA Act provides that the objectives of NOSDRA shall be to co-ordinate and implement the National Oil Spill Contingency Plan for Nigeria. Inasmuch as the functions of NOSDRA are partially embedded in its objectives, the NOSDRA Act for the avoidance of doubt, went on to specify and detail the functions of NOSDRA in Section 638 as follows, the Agency shall be responsible for surveillance and ensure compliance with all existing environmental legislation and detection of oil spills in the petroleum sector, receive reports of oil spillages and co-ordinate oil spill response activities throughout Nigeria; co-ordinate the implementation of the Plan as may be formulated, from time to time, by the Federal Government, co-ordinate the implementation of the Plan for the removal of hazardous substance as may be issued by the Federal Government ; perform such other functions as may be required to achieve the aims and objectives of the Agency under this Act or any Plan as may be formulated by the Federal Government pursuant to this Act (NOSDRA Act, 2006).

Nuclear Safety and Radiation Protection Act (NSRP) 2004:- The Act is concerned with the regulation of the use of radioactive substances and equipment emitting and generating ionizing radiation. Section 4 provides authority to make regulations for the protection of the environment from the harmful effects of ionizing radiation. Section 15 and 16 makes registration of premises and the restriction of ionizing radiation sources to those premises mandatory. Section 37 (1) (b) allows an inspector verify records of activities that pertain to the environment. Section 40 clarifies that the same regulations guiding the transportation of dangerous goods by air, land or water should also apply to the transportation of radioactive substances. In general, this act prescribed the conditions for importation, transportation, storage and use of nuclear and radioactive materials in Nigeria and the applicable safety measures for all purposes including its handling and use in the oil industry. The regulation is administered by the Nigeria Nuclear Regulatory Authority (NSRP, 2004).

Federal Road Safety Commission (FRSC) Act 2007:- In February 1988, the Federal Government created the Federal Road Safety Commission through Decree No. 45 of the 1988 as amended by Decree 35 of 1992 referred to in the statute books as the FRSC Act cap 141 laws of the Federal of Nigeria (LFN). Passed by the National Assembly as Federal Road Safety Commission (establishment) Act 2007. The functions of the Commission generally relate to:

1. Making the highway safe for motorists and other road users.
2. Recommending works and devices designed to eliminate or minimize accidents on the highways and advising the Federal and State Governments including the Federal Capital Territory Administration and relevant governmental agencies on the localities where such works and devices are required, and
3. Educating motorists and members of the public on the importance of discipline on the highway (FRSC Act, 2007).

The Fire Service Act, 2004:- The current structure of the Fire Service in Nigeria is based upon the legislation of the Fire Services Act of 1981 now replaced with the Fire Service Act, 2004. The Fire

Service Act provided for the establishment fire service, fire safety equipment in buildings, fire inspection, fire prevention and other fire safety management procedures. The regulation is administered by the Federal Fire Service (Fire Service Act, 2004).

Nigerian Maritime Administration and Safety Agency (NIMASA) Act, 2007:- Section 3 of the Nigerian maritime Administration and Safety Agency Act (NIMASA) 2007 established the Nigerian Maritime Administration and Safety Agency with powers under section 22 and 23 to regulate and certify seafarers, including regulation of safety of shipping as it relates to construction and navigation. It is also empowered to ensure compliance with vessel security measures; provide directions on qualification, certification, employment and welfare of maritime labour, and help implement international conventions regarding maritime safety, among other things. As part of its powers, Section 40 of the Act empowers it to detain ships which in its opinion are unsafe and a security risk, and therefore should not be allowed to proceed to the sea. It is also empowered to arrest anyone suspected to have committed an offence and also to expel any vessel which it believes to constitute safety or security risk to seafarers (NIMASA Act, 2007).

2.1.5 Definition of Common Occupational Safety Terms

SSMC (2015), RRC (2015) and ACT (2013) defined the common Occupational Safety terms in the following way:

Health:- health is concerned with the physical condition of both body and mind of people (workers, contractors, visitors and community) in or around a workplace and their protection from harm in the form of occupational diseases or ill health. This is by preventing illness and preserving human health. In this context, the wellbeing and welfare of people, and industrial hygiene can be considered as an aspect of occupational health.

Safety: Safety is concerned with the conditions at the workplace and applies to the pursuit of a state where the risk of harm, injury, damage, loss and mission degradation are eliminated or reduced to as low as reasonably practicable. This is the prevention of injury

of harm (particularly to people-workers, contractors, visitors and community), prevention of damage (asset or property), prevention of loss (production and other cost) and prevention of mission degradation (aims, targets, goals or corporate objectives).

Welfare: Welfare relates to the general well-being of workers at the workplace and the promotion of conditions which help to provide for their needs in respect of health, hygiene, comfort, social and personal well-being.

Environment: Environment is concerned with the occupational environment which relates the controls and management of generation of the environmental aspects (energy and matter). Energy generation include noise, heat, vibration, radiation, etc. while matter generation include, solid waste, liquid waste and gaseous waste. The protection of the external environment (the atmosphere, hydrosphere, lithosphere and biosphere) through the prevention of pollution and conservation of air, water, soil, plants, animals, wildlife, community etc is another environmental concern.

Hazard:- A condition with the potential for causing injury, damage, or mission degradation or an event, circumstance or condition with the potential to harm, including ill health, injury or death, damage to property, plant, products or the environment, production losses or increased liabilities.

Incident:An event that gives rise to harm, injury, death; damage to property, plant, products or the environment; production losses or increased liabilities; and mission degradation (accident), or an event with potential to lead to harm, injury, death, damage to property, plant, products or the environment, production losses or increased liabilities; and mission degradation (near-miss or near-hit).

Accident: An unplanned, unexpected event that interferes with or interrupts normal activity and potentially leads to harm, injury, death, damage to property, plant, products or the environment, production losses or increased liabilities; and mission degradation.

Near-Miss: Also known as a "Near Hit", it is an incident that does not quite result in an injury, loss or damage (but could have). Remember, a near-miss is

just as serious as an accident! A near miss should be reported and investigated like an accident. The reason a near-miss is investigated is to correct a situation before it causes an accident.

Unsafe Act: This is a behavioural departure from an accepted, normal, or correct procedure or practice, which has produced injury or property damage or has the potential for doing so. It is an unnecessary exposure to a hazard or conduct that reduces the degree of safety normally present in an activity.

Unsafe Condition: This is any physical state which deviates from that which is acceptable, normal, or correct as regards past or potential future production of injury/illness and property damage or a physical state which reduces the degree of safety.

Risk: Risk may be considered as the potential for adverse effects resulting from an activity or event, an expression of possible loss in terms of severity and probability. It is a statement of how likely and how seriously can things go wrong or the potential loss or damage. Risk can be summarized as the product of the likelihood or probability or chance that a specified undesired event will occur and the severity, consequences or effect of the event.

Risk Assessment: This is the process of identification of hazards, evaluation of the probability of an injury or illness or loss occurring, and its severity. Analysis or evaluation of the risk associated with such hazards, and determination of appropriate ways to eliminate or control the hazards.

Risk management: This is the reduction in material and property damage, effective mission accomplishment and reduction in serious injuries and fatalities.

Threat: This is a cause that may release a hazard to produce a Top Event. A Top Event is the release of the Hazard.

Barrier: This is a measure put in place to prevent threats from releasing a hazard.

Control: This is an aspect of risk management and is the measures we take to eliminate or reduce the risk to an acceptable level,

Job Safety Analysis: The breaking down into its component parts of any method or procedure to

determine the hazards connected with each key step and the requirement for performing it safety.

Safety Audit: This is the verification of the existence and implementation of elements of health, safety and environment management system and for verifying the system's ability to achieve defined safety objectives.

Safety Survey: Detailed examination of a narrower field of activity. E.g key areas revealed by safety audits.

Safety Inspection: Routine inspection-work is being carried in accordance with procedures etc.

Safety Tour: Unscheduled examination-hazards are removed-standards are removed.

Safety Sampling: Trained observers record the number of safety defects seen while touring specified locations by a prescribed route. Typically tours last for 15 min. and are conducted at weekly intervals. The un-weighted count of defects is used to portray trends in the safety situation.

Ergonomics: This is the science of fitting workplace conditions and job demands to the capabilities of employees. Ergonomic principles are used to improve the "fit" between the worker and the workplace. A practical approach to Ergonomics considers the match between the person, the equipment they use the work processes and the work environment. A person's capabilities, physical attributes and work habits must be recognized to improve ergonomic factors in the workplace.

Ergonomics is the study and design of the work environment to address physiological and physical demands on individuals. In a work setting, ergonomic studies look at such factors as fatigue, lighting, tools, equipment layout and placement of control

Emergency: This is a sudden abnormal or unplanned situation that may endanger life, health or the environment which requires urgent attention.

Disaster: An accident (flood, storm, earthquake, hurricane, tsunami etc) that causes large scale damage, loss of lives or injuries.

Contingency: This is an event or situation (disaster or emergency) that might happen in the future with serious consequences.

2.1.6 Common Hazards and Descriptions

Achalu (2000), SSMC (2015), RRC (2015) and ACT (2013) described occupational hazards as follows:

Chemical (Toxic): A chemical that exposes a person by absorption (Toxic) through the skin, inhalation, or through the blood stream that causes illness, disease, or death. The amount of chemical exposure is critical in determining hazardous effects. Check material Safety Data Sheets (MSDS) and chemical hazard information.

Chemical (Flammable): A chemical that, when exposed to a heat ignition (Flammable) source, results in combustion. Typically, the lower a chemical's flash point and boiling point, the more flammable the chemical. Check MSDS for flammability information.

Chemical (Corrosive): A chemical that, when it comes into contact with (Corrosive) skin, metal, or other materials, damages the materials. Acids and bases are examples of corrosives. Relate to the discharge of toxic liquids, gases, vapours, dust, fibres and other related hazards in the workplace.

Explosion (Over-Pressurization): Sudden and violent release of a large amount of gas/energy due to a significant pressure difference such as rupture in a boiler or compressed gas cylinder.

Electrical Shock/Short Circuit: Electrical contact with exposed conductors or a device that is incorrectly or inadvertently grounded, such as when a metal ladder comes into contact with power lines. 60Hz alternating current (common house current) is very dangerous because it can stop the heart.

Electrical (Fire): Use of electrical power that results in electrical overheating or arcing to the point of combustion or ignition of flammables, or electrical component damage.

Electrical (Static): The moving or rubbing of wool, nylon, other synthetic fibers, and even flowing liquids can generate static electricity. This creates an excess or deficiency of electrons on the surface of materials that discharges (spark) to the ground resulting in the ignition of flammables or damage to electronics or the body's nervous system.

Ergonomics (Strain): Damage of tissue due to overexertion (sprains and strains), awkward postures, or repetitive motion. It relates to suitability and compatibility of work methods, work tools and work layouts with people.

Ergonomics (Human Error): A system design, procedure, or equipment that is error-provocative. (A switch goes up to turn something off).

Excavation (Collapse): Soil collapse in a trench or excavation as a result of improper or inadequate shoring. Soil type is critical in determining the hazard likelihood.

Falls (Slips and Trips): Conditions that result in falls (impacts) from height or traditional walking surfaces (such as slippery floors, poor housekeeping uneven walking surfaces, exposed ledges, etc)

Fire/Heat: Temperatures that can cause burns to the skin or damage to other organs. Fires require a heat source, fuel, and oxygen.

Mechanical Vibration/Chaffing/Fatigue: Vibration that can cause damage to nerve endings, or material fatigue that results in a safety-critical failure, (Examples are abraded slings and ropes, weakened hoses and belts.) Mechanical Failure: Self-explanatory; typically occurs when devices exceed designed capacity or are inadequately maintained. Mechanical skin, muscle, or body part exposed to crushing, caught-between, cutting, tearing, shearing items or equipment.

Noise: Noise levels- .85 dB(A) 8 hr Time Weighted Average (TWA)- that result in hearing damage or inability to communicate safety-critical information.

Radiation (ionizing): Alpha, Beta, Gamma, neutral particles, and X-rays that cause injury (tissue damage) by ionization of cellular components.

Radiation (Ionizing):Alpha, Beta, Gamma, neutral particles, and X-rays that cause injury (tissue damage) by ionization of cellular components.

Radiation (Non-ionizing): Ultraviolet, visible light, infrared, and microwaves that cause injury to tissue by thermal or photochemical means.

Struck by (Mass acceleration): Accelerated mass that strikes the body causing injury or death, (Examples are falling objects and projectiles)

Struck Against: Injury to a body part as a result of coming into contact of a surface in which action was initiated by the person. (An example is when a screwdriver slips)

Temperature Extremes (Heat/Cold): Temperatures that result in heat stress, exhaustion, or metabolic slow down such as hypothermia.

Visibility: Lack of lighting or obstructed vision that results in an error or other hazard.

Violence in The Workplace: Any violent act that occurs in the workplace and creates a hostile work environment that affects employees' physical or psychological well-being.

Biological; Primarily airborne and blood borne viruses. It also relates to the presence of infectious bacteria, fungi, mites, insects in the workplace.

Environment Hazards: Are related to the workroom temperature, ventilation, illumination and weather events like rain, wind, lightening, snow, etc.

Lifestyle Health Hazards: Relate to smoking, drinking, health exercises, etc.

2.2 Empirical Review

Tam and Fung (2008) carried out a study on knowledge, awareness, practice and recommendations among Hong Kong workers on using personal respiratory protective equipment. The objective of the study was to assess the knowledge and practice on safety practices among workers. A descriptive survey design was adopted for the study. The population of the study consisted of all the management teams and frontline workers in industries in Hong Kong. A sample of 250 participants was selected randomly. A structured questionnaire and structured interview guides were used for the data collection. The descriptive statistics was used for the analysis of data. The result of the study showed that about 66.2% of the respondents were between 20 and 39 years old. Over 77% of the management team respondents received at least diploma education. Majority of the respondents have less than five-years working experience and six-to ten-year experience of about 33.2% and 29.3%. About 86% of the respondents agreed that involving awareness of health and safety can significantly help improving health and safety awareness for the

workers. The result of the study showed that more than half (55.9%) of the respondents used practiced occupational safety. It was concluded that, human factors play a major role in the causation and prevention of accidents and safety practices. Therefore, it was suggested that the government and related organizations should provide more training courses to workers in enhancing their awareness. This study is related and relevant to the present study because they are both focused on safety practice as a dependent variable.

Umoh and Torbira (2013) carried out a study on the safety practices and the productivity of employees in manufacturing firms: evidence from Nigeria. A descriptive survey design was adopted for the study. The population of the study consisted of all the employees in manufacturing firms. A simple random sampling technique was used to select a sample of 350 respondents for the study. Data was collected using a structured questionnaire and analysed using descriptive statistics and Pearson Correlation. The result showed that, there was a significant relationship between employers' compliance to safety rules and the man hour put in by employees in the production process ($r= 0.70$). It was concluded that, employees' production was correlated with compliance to safety rules. This study is related and relevant to the present study because they are both focused on safety practice as a dependent variable.

Iheanacho and Ebitu (2016) investigated the effects of industrial safety and health on employees' job performance in selected cement companies in Cross River State, Nigeria. The study adopted a survey research design. The population of the study consisted of all the staffs in the United Cement Company limited (Unicem) and Dangote Plc, with a samples size of 100 staff which was randomly selected for the study. Results of analysis show that, the calculated p-value for industrial safety and employee performance in terms of employee productivity (0.425) are all greater than 0.05 level of significances. This means that, there was no significant relationship existing between industrial safety and employee job performance in terms of productivity, employee/customer relationship and subordinate/management relationship in (SCC). The results also show that, the calculate r-value for

industrial safety and employee performance in terms of employee turnover of- 0.572 is in absolute term greater than the critical r-value of 0.195 degrees of freedom. This study is related and relevant to the present study because they are both focused on safety practice as a dependent variable.

Makori, Thuo, Kiongera and Muchilwa (2013) assessed the impact of occupational health and safety programmes on employee productivity of manufacturing firms in Kenya Western Province. A descriptive survey design was adopted for the study. The population of the study consisted of all the employees in manufacturing firms in Kenya. The study utilized a convenient sample by using all manufacturing firms in Western Kenya. Content validity and reliability of the research instruments were done through test retest method using one of the manufacturing firms which was not included in the final analysis. Reliability coefficient yielded a Cronbach's alpha of 0.88. The data from all the manufacturing firms was collected and analysed using descriptive statistics and inferential statistical tools like Pearson correlation, simple regression and one-way ANOVA. The study findings revealed a positive but less significant relationship between occupational health and safety programmes and employee productivity of manufacturing firms ($p < 0.05$). It was concluded that, OHSP were not efficient in the organizations studied, thus, affecting employee productivity of firms in terms of attitude, commitment, compliance, meeting goals, safety guard tampering, stress level, burn out, aggressiveness, absenteeism and sickness. This study is related and relevant to the present study because they are both focused on safety practice as a dependent variable.

Hadi, Palupi and Khoiron (2015) studies the effect of occupational safety and health program on the productivity of field workers of Access Network maintenance at PT. The observational analytic design was adopted for the study. The population of the study consisted of all the workers in Telkom Kandatel Jember. A purposive sampling technique was used to select 20 workers from all field workers of Access Network maintenance at PT for the study. Data collection was by observation, interviews and questionnaires. Samples were taken. In total of using

total sampling technique. Analysis technique used multiple linear regressions with F and T tests. The results concluded that the implementation of occupational safety and health program of Access Network maintenance at PT. Telkom Jember Kandatel is good. Work, productivity is high, and there is a significant effect of safety and health program on work productivity of workers either simultaneously or partially. This study is related and relevant to the present study because they are both focused on safety practice as a dependent variable.

Gbadago, Amedome and Honyenuga (2017) investigated the impact of occupational health and safety measures on employee performance at the South Tongu district hospital. The cross-sectional design was adopted for the study. The population of the study consisted of all the employees in South Tongu district hospital. The study used both stratified and simple random sampling methods to sample 116 employees of the Hospital including 5 management members. Questionnaires were administered and observation was carried out. However, only 88 questionnaires were retrieved and analysed using the SPSS software and results were displayed on tables. In assessing the impact of OHS on employee performance, all the respondents agreed that the practice of OHS impact on performance. Describing the nature of impact, majority (96.4%) indicated the OHS measures have positive impact on employee performance while less than 4 percent described the level of impact as negative. Finally, the results proved that there is a positive relationship between the OHS measures of the hospital and employee performance. This study is related and relevant to the present study because they are both focused on safety practice as a dependent variable.

2.3 Theoretical Framework

PRECEDE-PROCEED Model

The study was anchored on the PRECEDE-PROCEED Model. This model was propounded by Green and Kreuter in 1980. The PRECEDE-PROCEED model was developed as a planning framework from which health education and health promotion programs could be designed, see Figure 2.1. It is based on the premise that an educational diagnosis should precede an intervention just as a medical diagnosis precedes a

treatment plan. This model was chosen for this study in consideration of the fact that it relates with the needs (or requirements) assessment strategies, intervention and promotion programmes for workers. PRECEDE is acronym for. Predisposing, Reinforcing, and Enabling Constructs in Educational/Environmental Diagnosis and Evaluation. As its name implies, it represents the process that precedes, or leads up to, an intervention, PROCEED stands for: policy, Regulatory, and Organizational Constructs in Educational and Environmental Development, and true to its name as well, describes how to proceed with the intervention itself. The PRECEDE-PROCEED model, which assumes that health behaviours are complex and multidimensional, consists of a total 9 phases (Gielen & McDonald, 1997).

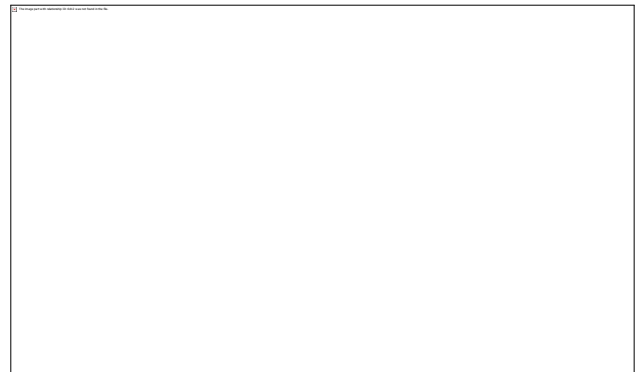


Figure 2.1 PRECEDE-PROCEED-Model

From figure 2.1 the first phase is to involve the workers in the four manufacturing companies in prioritizing the issues on which they want to focus on. This involves collecting demographic data in the form of interviews, questionnaires, and focus groups. The employees can then be involved in using those data to prioritize their outcomes. The focus here is on what the workers want and need. What outcome does the employees find most important? Eliminating or reducing a workplace hazards. Addressing an issue like training of workers. Providing or maintaining safety equipment, improving the quality of welfare provisions.

In phase, two, safety goals are identified using epidemiological data and problem are selected. All stakeholders in the workplace are involved in the process of identifying issues related to the outcome and determining what to influence. It must be decided

what could prevent the desired outcome or aid in achieving it, which factors are the most significant, and which can be influenced by intervention. Most of the factors influencing the issue or outcomes can be classified as behavioral, lifestyle, or environmental.

Phase three involves deciding what factors to manipulate in order to create the changes agreed upon in Phases 2. This requires analysis of the predisposing, enabling and reinforcing factors including the knowledge, beliefs and values of members of the workers, availability and accessibility of resources, and the attitudes of influential people.

In phase four, an organization must consider its own structure, policies and history in order to ensure that there are no internal factors that might act as barriers when trying to implement changes. Issues that must be considered include the group's organizational structures, procedures, culture and resources as well as policies regarding staff members, participants, specific practices, community laws, and issues related skills.

In phase five, the interventions devised must be carried out. This phase involved setting up and implementing the intervention as planned. At this points, the devised intervention (largely in Phases 3 and 4), based on initial assessment is carried out. This phase involves doing just that- setting up and implementing the intervention already planned.

Phases seven to nine model require the evaluation of the plan developed during the first 5 steps. During the implementation of the intervention, a process evaluation should be performed. This should ensure that the program was implemented according to the plan developed in steps 1-5. In phase seven, the organization must review the interventions underway to determine if the procedures are being carried out as planned. It must be determined if the specific tasks within the interventions are being carried out as intended. This phase is not about results, but about procedure. The evaluation here is if whether you are actually doing what you planned. If, for instance, you proposed to conduct workplace risk assessment or

carry out workplace inspection weekly in your company, are you in fact doing that?

In phase eight, an impact evaluation is performed to determine whether changes in predisposing, reinforcing, and enabling factors have occurred. The effects of the interventions are reviewed. A basic analysis must be conducted to ensure that the interventions are having the desired impact. Here, you begin evaluating the initial success of your efforts. Is the intervention having the desired effect on the behavioral or environmental factors that it aimed at changing- ie., is it actually doing what you expected?

Phase nine is the outcome Evaluation. Is the intervention really working to bring about the outcome the employees identified in Phase 1? It may be completely successful in every other way-the process is exactly what you planned, and the expected changes made- but its results may have no effect on the larger issue. In that case, we may have to start the process again, to see why the factors we focused on are not the right ones, and to identify others that might work.

2.4 Appraisal of Reviewed Literature

The conceptual framework overviewed the major concepts enumerated in the research. These concepts include: Meaning of Occupational Safety, occupational Safety practices, occupational Safety Practices among Employee, Occupational Safety legislations in Nigeria; and Definition and Description of Common Occupational Safety Terms. The empirical review considered different research findings or other researchers that relate to the occupational safety knowledge and practice among employees in manufacturing companies. The theoretical framework of the study adopted the PRECEDE-PROCEED Model to explain the occupational safety knowledge and practice among employees in manufacturing companies. It was evident from the various reviews that occupational safety knowledge and practice of employees may have significant relationship with level of education, age and years of work experience.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter describes research method and procedures under the following subheadings.

- 3.1 Study Area
- 3.2 Research Design
- 3.3 Population for the study
- 3.4 Sample and sampling techniques
- 3.5 Instrument for Data Collection
- 3.6 Validity of the instrument
- 3.7 Reliability of the instrument
- 3.8 Method of Data Collection/Instrumentation
- 3.9 Method of Data Analysis

3.1 Research Design

The study adopted a descriptive survey design. According to Kothari and Garg (2016), descriptive design is concerned with describing the characteristics of a particular individual, or a group, specific prediction, with narration of facts and characteristics concerning individual, group or situation. It involves collecting data in order to test hypotheses about the current state of affairs of the subject under study. This design was successfully used by Umoh and Torbira (2013) to investigate the safety practices and the productivity of employees in manufacturing firms: evidence from Nigeria. Hence, it is considered appropriate for this study

3.2 Study Area

The area of study is Obio/ Akpor LGA, Rivers State Nigeria where the four companies are located. Uniport

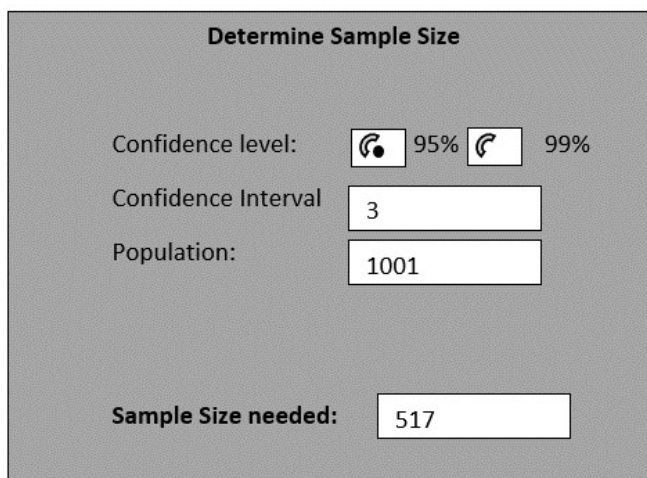
Bottling Water is precisely located at Abuja Campus University of Port Harcourt, Rivers State, the production facility was commissioned in 2005 for the production of drinking water. La Sienis located at 75c Ordinance road trans-amadi, Rivers State, It was established in 2002 as table Water Company. El-Roi water is located at 4 El-Roi close Rumuekini Obio/akpor Rivers State Nigeria it was established in 2006. Aqua Lez water is located at kilometer 20 east/west road nkpolu rumuigbo Port Harcourt. It was established in 2009 as water bottled company Nigeria Limited

3.3 Population for the Study

The population of this study consisted of all the 1001 employees in the four table water manufacturing companies of interest which include: 361 employees working at El-Roi water, 197 employees working at Uniport Bottling Water, 208 employees working at the La Sien water and 235 employees working at Aqua Lez water

3.4 Sample and Sampling Techniques

A sample size of 517 was determined using the sample size calculator software developed by Creative Research Systems, as part of its public service program as shown in Figure 3.1. The survey software can determine a sample size for a given population for a particular confidence interval and confidence level to know how many people needed to be sampled in order to get results that reflect the target population as precisely as needed,



Source: (Creative Research Systems)
Figure 3.1; Sample Size Calculator

Given a population size of 1001, with a confidence level of 95% and a confidence interval of 3, a sample size of 517 was generated.

The selection of the respondents from each company was through proportionate random sampling using proportionate stratified technique. The sample size of each company in this technique is proportionate to the population size of the company when viewed against the entire population. This means that each company has the same sampling fraction as shown in Table 3.1 below.

Table 3.1: Sample size allocation table

Name of Company	El-Roi water	Uniport Bottling Water	La-Sien Water	Aqua-Lez water	Total
Population size	361	197	208	235	1001
Sampling percentage	36%	19.7	20.8%	23.5%	100%
Final Sample Size	186	102	108	121	517

Following the final sampling size indicated in Table 3.1 above, respondents were then selected randomly from each company.

3.5 Instrument for Data Collection

The instrument used for data collection was a structured questionnaire. The questionnaire comprised of section A, B and C. section A comprise of items response for demographic variables from number 1 – 4, Section B included item number 5 – 22, this expounded respondent’s responses on the level of knowledge on occupational safety of employees with True or False options. Section C included items from number 23 – 40 with responses on the occupational safety practices of employees with response option of always occasionally, hardly and never.

3.6 Validity of Instrument

To ascertain the face and content validity of the instrument, the researcher consulted the research supervisor and three other lecturers in the Department of Human Kinetics, Health and Safety Education. Copies of the instrument accompanied with the objectives, research questions and hypotheses were given to them for vetting. Their suggestions and contributions were effected on the questionnaire which was used to develop the final copy.

3.7 Reliability

The researcher carried out a test-retest on 25 workers using 25 copies of the instrument on Nigeria Engineering Work Limited, a manufacturing company different from the four target companies. Firstly, 25 copies of the instruments were issued to 25 workers during the pre-test followed by the re-issuance of the same questionnaire to the same set of workers after two weeks’ period. After the collection of data, the outcome of the two test results was then correlated using Pearson Product Moment Correlation, a reliability co-efficient of 0.74 was obtained, which established the reliability of the instrument.

3.8 Method of Data Collection

Primary data was collected using the questionnaire which were administrated directly to the respondents by the researcher and by the help of four research assistants. The respondents filled the questionnaire at their own convenient time to avoid inconvenience during work hours and thereafter the questionnaire was retrieved. Distribution was through face to face delivery of the questionnaire. The contents of the questionnaire were explained to the respondents on the course of data collection. The respondents were assured that their names would not appear on the questionnaire, their responses would not be used against them and that it would be treated with utmost confidentiality. Five hundred and twelve (512) copies of questionnaire were distributed, but four hundred and

fifty-six (456) copies were correctly filled. This gave a return rate of 88.20%, therefore 456 returned copies of questionnaire were used for data analysis.

3.9 Method of Data Analysis

Data was checked for accuracy, uniformity, logical completeness and consistency before analysis. The

demographic variables and research questions were analyzed using descriptive statistics of frequency, percentage, mean and Pearson correlation, while the hypothesis were tested using chi-square and ANOVA at 0.05 level of significance for relevant variables.

CHAPTER 4

PRESENTATION OF DATA, DATA ANALYSIS AND DISCUSSION OF FINDINGS

In this chapter, data analysis are presented followed by the discussion of findings.

4.1: Data presentations

Data were present using tables and figures as shown below:

Table 4.1 Data Presentations

Data were present using tables and figures as shown below:

Table 4: 1 Age distribution of respondents

Age	Frequency (F)	Percentage (%)
< 30 years		33.3
30 – 39 years	196	43.0
40 – 49 years	83	18.2
≥ 50 years	25	5.5
Total	456	100.0

Table 4.1 shows the age of respondents. 196 (43.0%) were within age 30 – 39 years, 152 (33.3%) were aged less than 30 years, 83 (18.2%) were aged 40 – 49 years while 25 (5.5%) were aged 50 years and above.

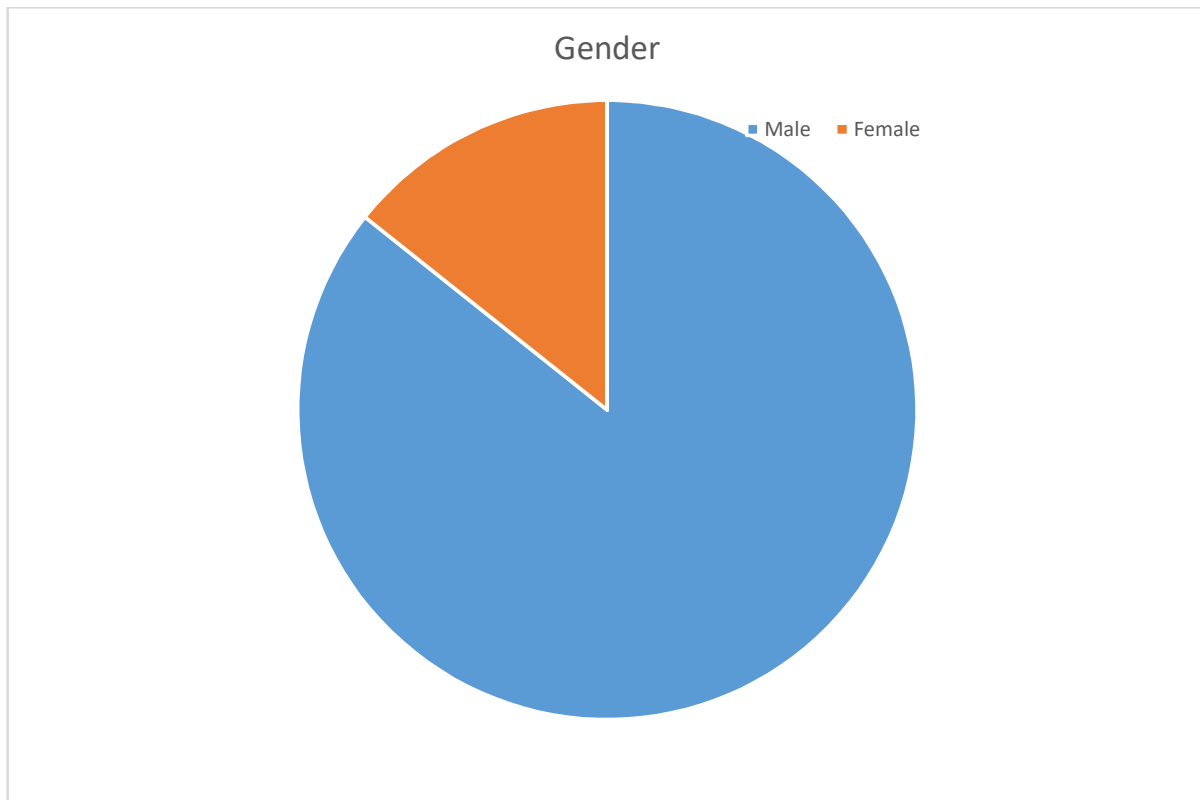


Figure 4.1: Pie Chart showing the gender of respondents. Male = 391 (85.7%), Female = 65 (14.3%).

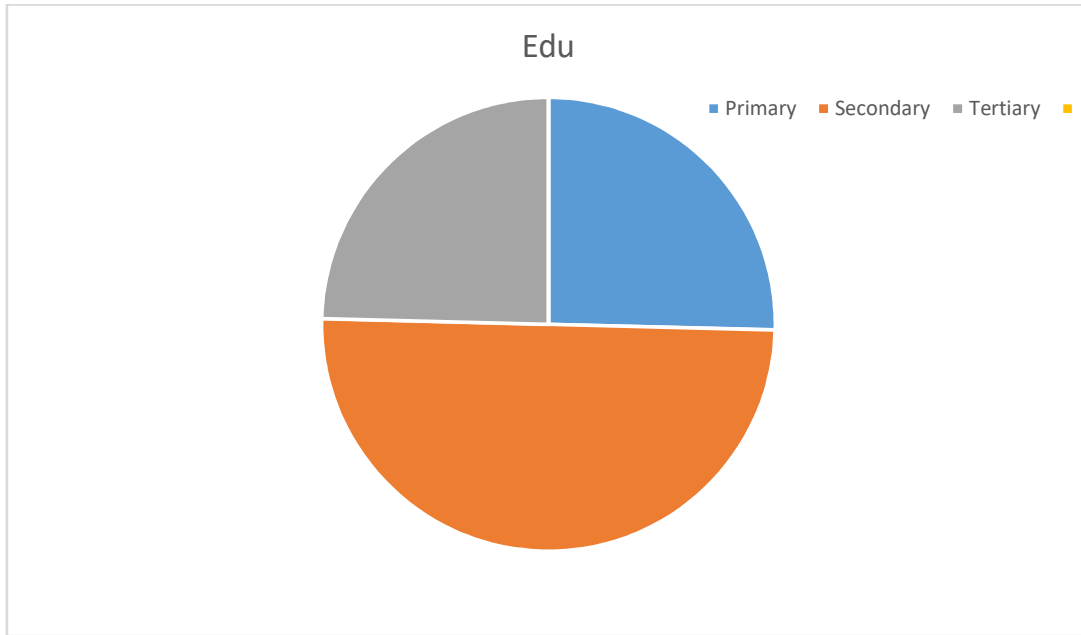


Figure 4.2: Pie Chart showing level of education of respondents. Primary = 116 (25.4%); Secondary = 228 (50.0%) and Tertiary = 112 (24.6%)

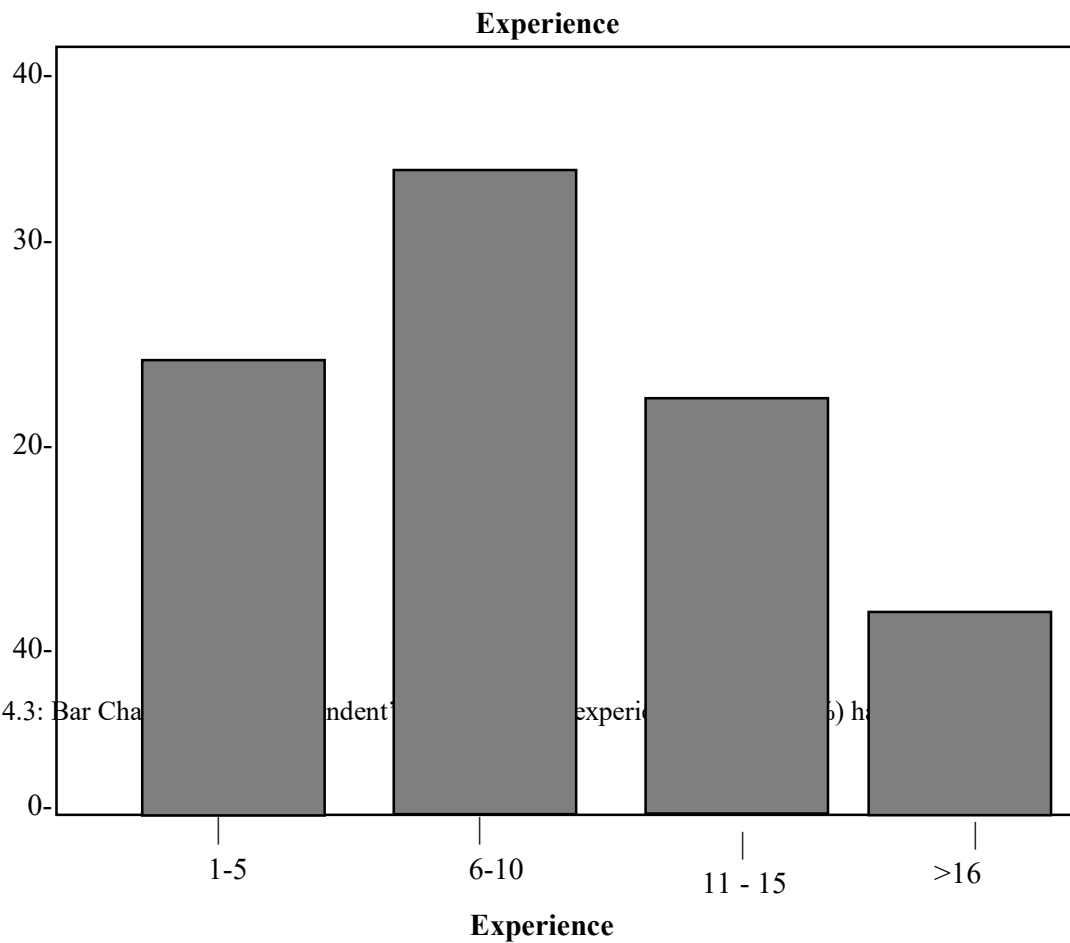


Figure 4.3: Bar Chart showing the number of respondents for different experience ranges.

Research Question 1:

What is the level of knowledge on occupational safety among employees in four table water manufacturing companies in Obio/Akor LGA?

Table 4.2: Knowledge of occupational safety of Respondents

Knowledge*	score	F	%
Good \geq 14	340	74.6	
Poor	<14	116	25.4
Total	18	456	100

Mean knowledge = 14 ± 5.32

* Non responses excluded

Table 4.2 reveal the knowledge score of respondents. The finding of the study shows that 340 (74.6%) of the respondents scored 14 and above which was assumed to be good knowledge and 116 (25.4%) scored less than 14 which was assumed to be poor knowledge. Based on the mean knowledge on occupational safety (14 ± 5.32), therefore the knowledge level of the respondents was good (74.6%).

Research Question 2

What are the occupational safety practices among employees in four table water manufacturing companies in Obio/Akor LGA?

Table 4.3: Occupational safety practices of respondents

S/N	Items	Always F (%)	Occas. F (%)	Hardly F (%)	Never F (%)	Mean	Deci.
1.	I follow my company's safety rules and regulations	368 (80.7)	67 (14.7)	17 (3.7)	4 (0.9)	3.75	Good
2.	I report workplace hazards and faulty equipment	352 (77.2)	82 (18.0)	14 (3.1)	8 (1.8)	3.71	Good
3.	I report workplace incidents	196 (43.0)	105 (23.0)	76 (16.7)	76 (16.7)	2.92	Good
4.	I attend safety meetings	91 (20.0)	147 (32.2)	82 (17.9)	136 (29.8)	2.49	Good
5.	I participate in "toolbox" meetings	106 (23.2)	161 (35.3)	86 (18.9)	103 (22.6)	2.48	Good
6.	I take part in fire and emergency drill	98 (21.5)	143 (31.4)	93 (20.4)	122 (26.8)	2.48	Poor
7.	I take part in safety training	324 (71.1)	95 (20.8)	26 (5.7)	11 (2.4)	3.60	Good
8.	I use foot protection like safety shoes at work	342 (75.0)	64 (14.0)	37 (8.1)	13 (2.9)	3.61	Good
9.	I use head protection like helmet at work	221 (48.5)	136 (29.8)	45 (9.9)	54 (11.8)	3.15	Good
10.	I use Eye protection like eye	237 (52.0)	120 (26.3)	88 (19.3)	11 (2.4)	3.28	Good

	goggle at work						
11.	I use Hand protection like hand glove at work	310 (68.0)	85 (18.6)	35 (7.7)	26 (5.7)	3.45	Good
12.	I use Hearing protection like ear muff or ear plug at work	80 (17.5)	147 (32.2)	82 (18.0)	147 (32.2)	2.35	Poor
13.	I use of Respiratory protection like nose mask at work	317 (69.5)	91 (20.0)	33 (7.7)	15 (3.3)	3.56	Good
14.	I use Fall Arrestors when working at height	325 (71.3)	81 (17.8)	30 (6.6)	20 (4.4)	3.64	Good
15.	I use work clothing like Coverall or work uniform at work	350 (76.8)	63(13.8)	33(7.3)	10(2.2)	3.64	Good
16.	I ensure my work area is clean and orderly	220(48.2)	132(28.9)	80(17.5)	24(5.3)	3.20	Good
17.	I ensure that machine guards are in place	86(18.9)	146(32.0)	80(17.5)	144(31.6)	2.38	Poor
18.	I correct other workers who do not follow safety rules	106(23.2)	61(12.4)	185(40.6)	104(22.8)	2.37	Poor
	Grand Total/Mean	229(50.2)	107(23.5)	63(13.8)	57(12.5)	3.11	Good

Table 4.3 revealed the occupational safety practices of the respondents. The result showed that the major occupational safety practice of the respondents was adherence to company's safety rules and regulations (80.7%), followed by report of workplace hazards and faulty equipment (77.2%), use of clothing like coverall or work uniform at work (76.8%), use of foot protection like safety shoes (75.0%), use of fall arrestors when working at height (71.3%), taking part in safety training (71.1%), use of respiratory protection like nose mask (69.5%), use of hand protectors like glove (68.0%) and eye protector like goggle (52.0%). Overall, about half 229(50.2%) of the respondents practice occupational safety always, 107(23.5%) practice occasionally, 63(13.8%) hardly while 57(12.5) never practiced occupational safety.

Research Question 3

What is the relationship between knowledge on occupational safety and the level of education of employees?

Table 4.4 Relationship between knowledge on occupational safety and level of education

Education	Knowledge		Total	r-value	Decision
	Poor	Good			
Primary	110(94.8)	6(5.2)	116(100)	0.80	Very high
Secondary	4(1.8)	225(98.2)	228(100)		
Tertiary	2(1.8)	110(98.2)	112(100)		
Total	116(25.4)	340(74.6)	456(100)		

* Very high relationship

Table 4.4 show the relationship between knowledge on occupation safety and the level of education of respondents. The result of the study shows that 98.2% each of the respondents who had secondary and tertiary education had good knowledge on occupational safety. The result of the study further shows a very high relationship between education and knowledge ($r=0.80$).

Research Question 4

What is the relationship between knowledge on occupational safety and the age of employees?

Table 4.5 Relationship between knowledge on occupational safety and age

Education	Knowledge		Total	r-value	Decision
	Poor	Good			
<29 years	11(7.2)	141(92.8)	152(100)	-0.81	Very high
30-39 years	8(4.1)	188(95.9)	196(100)		
40-49 years	78(93.9)	5(6.1)	83(100)		
≥50 years	19(76.0)	6(24.0)	25(100)		
Total	116(25.4)	340(74.6)	456(100)		

* Very high negative relationship

Table 4.5 show the relationship between knowledge on occupation safety and the age of respondents. The result of the study shows that 92.8% and 95.9% of the respondents who were 30-39 years and 40-49 years old had good knowledge of occupational safety. The result of the study further shows a very high negative relationship between age and knowledge ($r = 0.81$).

Research Question 5

What is the relationship between knowledge on occupational safety and years of work experience of employees?

Table 4.6 Relationship between knowledge on occupational safety and years of work experience

Years of Experience	Knowledge		Total	r-value	Decision
	Poor	Good			
1-5 years	11(9.1)	110(90.9)	121(100)	-0.75	High
6-10 years	44(25.7)	127(74.3)	171(100)		
11-15 years	43(37.7)	71(62.3)	114(100)		
≥16	18(36.0)	32(64.0)	50(100)		
Total	116(25.4)	340(74.6)	456(100)		

* High negative relationship

Table 4.5 show the relationship between knowledge on occupation safety and the years of work experience of respondents. The result of the study shows that 90.9% and 74.3% of the respondents who had 1-5 years and 6-10 years of work experience had good knowledge of occupational safety. The result of the study further shows a very high relationship between years of work experience and knowledge ($r = 0.75$).

Research Question 6

What is the mean difference in occupational safety practice of employees with respect to level of education?

Table 4.7 Difference in occupational safety practice of employees with respect to level of education

Education	N	Means	Stand, Dev.	Mean Difference
Primary	116	2.00	.00	
Secondary	228	2.00	.00	.05
Tertiary	112	1.1	32	
Total	456	1.78	41	

Table 4.7 showed the difference in occupation safety practice of employees with respect to level of education. The result shows that the mean difference in occupational safety practice of employees with respect to level of education was $0.05 \pm .00$.

Research Question 7

What is the mean difference in occupational safety practice of employees with respect of age?

Table 4.8 Difference in occupational safety practice of employees with respect to age

Age	N	Mean	Stand, Dev.	Mean Difference
<29 years	152	2.00	.00	
30-39 years	196	2.00	.00	17
40-49 years	83	1.11	.31	
≥ 50 years	25	1.00	.00	
total	456	1.78	.41	

Table 4.8 showed the difference in occupation safety practice of employees with respect to age. The result shows that the mean difference in occupational safety practice of employees with respect to age was $0.17 \pm .00$.

Research Question 8

What is the mean difference in occupational safety practice of employees with respect to level of education?

Table 4.9 Difference in occupational safety practice of employees with respect to years of work experience

Years of experience	N	Means	Stand, Dev.	Mean Difference
<29 years	121	2.00	.00	
30-39 years	171	2.00	.00	37
40-49 years	114	1.57	.49	
≥ 50 years	50	1.00	.00	
Total	456	1.28	.41	

Table 4.9 showed the difference in occupation safety practice of employees with respect to years of work experience. The result shows that the mean difference in occupational safety practice of employees with respect to years of work experience was $0.37 \pm .00$.

Test of Hypotheses

Hypothesis 1:

There is no significant relationship between knowledge on occupational safety and level of education of employees.

Table 4.10: Chi-square test showing Relationship between knowledge on occupational safety and level of education.

Education	Knowledge		Total	Df	X ² - Value	P- Values	Decision
	Poor	Good					
Primary	110(94.8)	6(5.2)	116(100)	2	435.281	0.000	Rejection
Secondary	4(1.8)	225(98.2)	228(100)				
Tertiary	2(1.8)	110(98.2)	112(100)				
Total	116(25.4)	340(74.6)	456(100)				

Significant $p < 0.05$

The null hypothesis states that there is no significant relationship between knowledge on occupational safety and the level of education employees. The finding of the study revealed a significant relationship between knowledge and educational level ($p < 0.05$, $df=2$, $X^2 = 435.281$). the null hypothesis is therefore rejected (Table 4.10).

Hypothesis 2:

There is no significant relationship between knowledge on occupational safety and age of employees.

Table 4.11: Chi-square test showing Relationship between knowledge on occupational safety and age

Age	Knowledge		Total	Df	X ² - Value	P- Values	Decision
	Poor	Good					
<29 years	11(7.2)	141(92.8)	152(100)	3	415.544	0.000	Rejection
30-39 years	8(4.1)	188(95.9)	196(100)				
40-49 years	78(93.9)	5(6.1)	83(100)				
≥50 years	19(76.0)	6(24.0)	25(100)				
Total	116(25.4)	340(74.6)	456(100)				

Significant $p < 0.05$

The null hypothesis states that there is no significant relationship between knowledge of occupational safety and age of employees. The finding of the study revealed a significant relationship between knowledge and age ($p < 0.05$, $df=3$, $X^2 = 415.544$). The null hypothesis is therefore rejected (Table 4.11).

Hypothesis 3:

There is no significant relationship between knowledge on occupational safety and years of work experience of employees.

Table 4.12: Chi-square test showing Relationship between knowledge on occupational safety and years of work experience.

Years of Experience	Knowledge		Total	Df	X ² - Value	P- Values	Decision
	Poor	Good					
1-5 years	11(7.2)	110(92.8)	121(100)	3	309.488	0.000	Rejection
6-10 years	44(4.1)	127(95.9)	171(100)				
11-15 years	43(93.9)	71(6.1)	114(100)				
≥16 years	18(76.0)	32(24.0)	50(100)				
Total	116(25.4)	340(74.6)	456(100)				

Significant p<0.05

The null hypothesis states that there is no significant relationship between knowledge on occupational safety and years of work experience of employees. The finding of the study revealed a significant relationship between knowledge and years of work experience (p<0.05, df=3, X² = 309.488). The null hypothesis is therefore rejected (Table 4.12).

Hypothesis 4:

There is no significant difference in the occupational safety practice of employees with respect to level of education.

Table 4.13: ANOVA result showing difference in the occupational safety practice with respect to level of education.

Sources of Variance	Sum of squares	Df	Mean sum of squares	F-value	p- value	Decision
Between group	66.016	2	33.008	1301.2	.000	Rejection
Within group	11.491	453	.025			
Total	77.507	455				

Significant p<0.05

A one way between group analysis of variance was conducted to examine the significant difference in occupational safety practice with respect to level of education. The result shows a statistically significant difference (p<0.05, F(2,453) = 1301.2, p – 0.000) in occupational safety practice with respect to level of education. The null hypothesis which states that there is no significant difference in occupational safety practice with respect to level of education was therefore rejected.

Hypothesis 5:

There is no significant difference in the occupational safety practice of employees with respect to age.

Table 4.14: ANOVA result showing difference in the occupational safety practice with respect to age.

Sources of Variance	Sum of squares	Df	Mean sum of squares	F-value	p- value	Decision
Between group	69.482	3	23.161	1304.6	.000	Rejection
Within group	8.024	452	.018			
Total	77.507	455				

Significant p<0.05

A one way between group analysis of variance was conducted to examine the significant difference in occupational safety practice with respect to age of respondents. The result shows a statistically significant difference ($p < 0.05$, $F(3,452) = 1304.6$, $p = 0.000$) in occupational safety practice with respect to age. The null hypothesis which states that there is no significant difference in occupational safety practice with respect to age was therefore rejected.

Hypothesis 6:

There is no significant difference in the occupational safety practice of employees with respect to years of work experience.

Table 4.14: ANOVA result showing difference in the occupational safety practice with respect to years of experience.

Sources of Variance	Sum of squares	Df	Mean sum of squares	F-value	p- value	Decision
Between group	49.568	3	16.523	267.31	.000	Rejection
Within group	27.939	452	.062			
Total	77.507	455				

Significant $p < 0.05$

A one way between group analysis of variance was conducted to examine the significant difference in occupational safety practice with respect to years of experience. The result shows a statistically significant difference ($p < 0.05$, $F(3,452) = 267.31$, $p = 0.000$) in occupational safety practice with respect to years of experience. The null hypothesis which states that there is no significant difference in occupational safety practice with respect to years of experience was therefore rejected.

4.2 Discussion of Findings

The findings of this study in Table 4.2 showed that about three quarter (74.5%) of the respondents had a good knowledge of occupational safety. This finding is not surprising as there is the expectation that the safety and health department of these manufacturing companies are active in carrying out their duty particularly on educating, training and retraining the workers on occupational safety. This can be implicated for the good knowledge found in this study. The finding of this study is similar to that of Albert, Hallowell and Kleiner (2014) where knowledge on safety practices was found to be good. The finding of this study also corroborates that of Ulang, Salim, Baharum and Salim (2014) where more of the respondents were found to have good knowledge on occupational safety. The commitment of the mass

media in disseminating information on health and general well-being might be implicated for the similarity found in the previous studies and the present one. The finding of this study is in agreement with that of Sah et al (2015) where it was reported that, all the workers had some basic knowledge about occupational safety. The contribution of various knowledge promoting materials in the society today may be implicated for the similarities found in the previous and present study. To buttress this, it has been observed that, the society is fast growing in the aspect of knowledge and there is the expectation that more workers in the manufacturing companies are taking advantage of the technological innovations to access occupational safety related information.

The finding of this study is different from that of Peter and Olasumbo (2014) where the knowledge of safety practices was found to be poor. The variation in the sample size and the study design might be implicated for the difference found in the two studies. The finding of this study is different from that of Adewale and Adhuzo (2017) which showed that majority of the respondents have poor knowledge of occupational safety practices. This difference found between the present study and the previous one might be due to the difference in the study area, and the sample size. The findings of this study also differ from that of Vitharam,

Subashe and Sudhira (2015) where poor knowledge of occupational safety was recorded. The fact that the previous study analysed data qualitative whereas the present study analyzed the data generated quantitatively might be implicated for the variations found between the two studies. Also, the variation found between the previous studies and the present one might be explained by the fact that, the previous studies were not focused only on employees working in manufacturing companies like the present study did.

The result of the study in Table 4.3 revealed that the major occupational safety practices of the respondents was adherence to company's safety rules and regulations (80.7%), followed by report of workplace hazards and faulty equipment (77.2%). The finding of this study is akin to Adebola (2014) which showed that majority (90.0%) of the respondent comply with safe work practices and high proportion of the respondents (85.9%) have compliance with occupational safety procedure. The result of this study also showed other occupational safety practices of respondents which include: use of clothing like coverall or work uniform at work (76.8%), use of foot protection like safety shoes (75.0%), use of fall arrestors when working at height (71.3%), taking part in safety training (71.1%), use of respiratory protection like nose mask (69.5%), use of hand protectors like glove (68.0%) and eye protector like goggle (52.0%). The finding of this study is in agreement with that of Sah, Shah, Yadav, Salahuddin, Yadav, Razin, Rashid and Dhita (2015) where occupational safety such as use of personal protective clothing during work time was practiced by majority of the respondents. The similarity found between the previous study and the present one is not surprising because, there is the possibility that, the workers were strictly monitored by the safety supervisors of the company on compliance to occupational safety practices in order to avoid the cost of accidents and damages incurred by the company.

The findings of this study showed a high relationship between knowledge and other variables such as education ($r=0.80$), age (-0.81) and years of working experience ($r = -0.75$). The result of the tested hypotheses on this revealed that factors such as education ($p<0.05$), age ($p<0.05$) and years of work experience ($p<0.05$) had a significant relationship with knowledge of occupational safety. The findings of this study gives is similar to that of Adebola (2014) which showed a statistical significant relationship between educational status and knowledge of occupational safety ($p<0.05$) at 95% level of significance. The findings of this study is also similar to that of Amabye (2016) which showed that there was a statistically significant association between knowledge of occupational safety and demographic variable such as age and educational status ($p<0.001$). the reason for the similarity found between previous studies and the present can be attributed to the fact that, education is helping to fill the gap in knowledge in wide variety of issues in the society.

The result of this study showed that there was a statistically significant difference in occupational safety practice with respect to education ($p<0.00$), age ($p<0.05$) and years of work experience. The findings of this study is similar to that of Amabye (2016) which showed a significant association between occupational safety practice and educational status ($p<0.001$). The finding of this study is in keeping with that of Adebola (2014) which showed that compliance to hazard control practice was quite high among those with post-secondary education and relatively low in respondents with secondary education and that there was a statistical significant relationship between educational status and practice at 95% level of significance $p\leq 0.05$. The similarity found in the present study and the previous ones might be due to the fact that education is helping to fill in gap in knowledge and the subsequent practice found among the respondents.

CHAPTER FIVE

Summary, Conclusion and Recommendation

5.1 Summary

This study examined the occupational safety knowledge and practices of employees in four table water manufacturing companies in Obio/Akor LGA of Rivers State. Eight research questions and six hypotheses were formulated to achieve the aim of the study. The study adopted a descriptive survey design with a population which consisted of all the 1001 employees in the four manufacturing companies of interest. A proportionate random sampling technique was used to select a sample size of 517. The instrument for data collection was as structured questionnaire with a reliability index of 0.74. Data collected was analyzed using Statistical Package for Social Science (SPSS) version 20. Statistical tools such as frequency count, percentage, mean, Pearson Correlation and ANOVA were used to analyze the data generated.

The findings of the study showed that, about three quarter (74.5%) of the respondents had a good knowledge of occupational safety. Overall, about half 229(50.2%) of the respondents practice occupational safety always, 107(23.5%) practiced occasionally, 63(13.8%) hardly while 57(12.5) never practiced occupational safety. The result further showed that, The result showed that the major occupational safety practice of the respondents was adherence to company's safety rules and regulations (80.7%), followed by report of workplace hazards and faulty equipment (77.2%), use of clothing like coverall or work uniform at work (76.8%), use of foot protection like safety shoes (75.0%), use of fall arrestors when working at height (71.3%), taking part in safety training (71.1%), use of respiratory protection like nose mask (69.5%), use of had protectors like glove (68.0%) and eye protector like goggle (52.0%). The findings of this study showed a high relationship between knowledge and other variables such as education ($r=0.80$), age (-0.81) and years of working experience ($r=-0.75$). The result of the tested hypotheses on this revealed that factors such as education ($p<0.05$), age ($p<0.05$) and years of work experience ($p<0.05$) had a significant relationship with knowledge of occupational safety. Also, there was a

statistically significant difference in occupational safety practice with respect to education ($p<0.00$), age ($p<0.05$) and years of work experience.

5.2 Conclusion

Based on the findings of the study, it was concluded that, employees working in manufacturing companies have good knowledge and good practice of occupational safety. However, factors such as age, education and years of work experience are significantly related to the employees' knowledge and practice of occupational safety.

5.3 Recommendations

Based on the findings of this study, it was recommended that,

1. Management of the table water manufacturing companies should continue to promote good knowledge and practice of occupational safety and consider age, level of education and years of work experience before work placements. Management shall continue to ensure a safe place of work for all employees through provision of safe access and egress in proper hygiene. It is also important for them to ensure the provision of a safe plant and equipment by considering the need to inspect, service and replace machinery; and the provision of a safe system of work through documenting safe operating procedures and work permit. Appropriate policy review, planning, provision of resources, training and supervision are key to ensure competency of employees.
2. Safety Specialist (or Practitioners or professionals) working in water manufacturing companies should continue to give correct advice to management so that the organization can meet its legal obligations and achieve its safety policy objectives. They should also ensure that regular workplace inspection, risk assessment, audits, job safety analysis and safety training are conducted for continued improvement. It is also important that

incidents are investigated to determine causes in order to prevent reoccurrence.

3. Employees working in water manufacturing companies need to take reasonable care of their own safety and that of their colleagues, comply with safety instructions and procedures given by management and use all safety equipment properly. They are to ensure that they report any situation which they believe could be a hazard and which they cannot themselves correct and also report any work-related accident.
4. Professional organizations such as the National Industrial Safety Council of Nigeria (NISCN) and the Institute of Safety professionals of Nigeria (ISPON); that unions such as the Nigeria Labour Congress (NLC) and Trade Union Congress (TUC); and relevant government agencies should organized periodic workshops and training programmes on safety to sustain the awareness of occupational safety among employees in manufacturing companies.
5. Relevant government departments and enforcement agencies such as Factory Inspectorate Division of the Federal Ministry of Labour, Department of Petroleum Resources (DPR), National Environmental Standards and Regulations Enforcement Agency (NESREA), National Oil Spill Detection Agency and response Agency (NOSDRA), Federal Fire Service among others must sustain the regular monitoring and inspection of workplaces to ensure operations meet required safety standards and prescribed legal requirements. Where need arises enforcement action or prosecution should be carried out.

5.4 Suggestion for Further Studies

It was suggested by the researcher that; similar studies be carried out among employees working in other manufacturing companies in other mention locations to compare the findings of the present study.

5.5 Contribution to Knowledge

This study contributed to knowledge in the following ways:

1. It has provided empirical evidence on the occupational safety knowledge of workers in table water manufacturing companies in Obio/Akor LGA of Rivers State.
2. It has also provided empirical evidence on the occupational safety practices of workers in table water manufacturing company in Rivers State.

It has added to the existing body of literatures on occupational safety knowledge and practice of workers in different occupations.

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**APPENDIX 1
QUESTIONNAIRE**

Department of Human Kinetics, Health
and Safety Education
Faculty of Natural and Applied Sciences
Ignatius Ajuru University of Education
Port Harcourt.

Date: 6th May, 2021

Dear Respondent,

**QUESTIONNAIRE ON OCCUPATIONAL SAFETY KNOWLEDGE AND PRACTICE AMONG
EMPLOYEES IN FOUR MANUFACTURING COMPANIES IN OBIO/AKOR LGA**

I am a student at the Ignatius Ajuru University of Education (Faculty of Natural and Applied Sciences), I am carrying out a research on the above-mentioned topic. Your company is one of the companies of interest for this study.

I would like your statement to be as objective as possible regarding the subject matter. Your cooperation by responding truthfully and sincerely to this questionnaire is very essential to achieving the thesis objectives.

All information obtained through this questionnaire will be used purely for academic research purposes only and will be treated with utmost confidentiality.

Thanks for your co-operation.

Yours sincerely,

Righteous, Innime
(Researcher)

SECTION A: PERSONAL DATA

Instruction: Please tick (√) in the appropriate box

1. Age: a. below 30 years [] b. 30-39 years [] c 40-49 years [] d. 40 years []
2. Gender: Male [] Female []
3. Level of Education: a. Primary [] b. Secondary [] c. Tertiary []
4. Years of Work Experience: a. 1-5 years [] b. 6-10 years [] c. 11-15 years [] d. 16 and above []

SECTION B: KNOWLEDGE

Instruction: Please indicate by ticking (√) in the appropriate column, your opinion regarding each of the following statement.

S/N	QUESTION	TRUE	FALSE
5.	Chemicals can enter the body through inhalation		
6.	Chemicals can enter the body through absorption		
7.	A hazard has potential for causing injury or damage		
8.	Improper use of PPE and lead to injury		
9.	Every company needs a first aid box		
10.	An exposed life terminal can cause electrocution		
11.	High noise can lead to hearing impairment		
12.	Fuel, heat and oxygen are elements of fire		
13.	Wood and paper are types of fuel		
14.	When the fire alarms sounds move to the muster point		
15.	Wrong lifting technique can cause back injury		
16.	Daily tool box meeting can improve safety practice		
17.	Fixed machine guards can prevent injury		
18.	Incident investigation can prevent reoccurrence		
19.	Workplace inspection can detect hazards		
20.	All types of gloves provide same level of protection		
21.	A near-miss can result in an injury or damage		
22.	Frist box cannot prevent injury in the workplace		

SECTION C: OCCUPATIONAL SAFETY PRACTICES

Instruction: Please indicate the extent of your agreement with the following statement by ticking (√) on the scale that most nearly reflects the extent to which you agree to disagree.

S/N	STATEMENT	Always	Occasionally	Hardly	Never
23.	I follow my company's safety rules and regulations				
24.	I report workplace hazards and faulty equipment				
25.	I report workplace incidents				
26.	I attend safety meetings				
27.	I participate in "toolbox" meetings				
28.	I take part in fire and emergency drill				
29.	I take part in safety training				
30.	I use foot protection like safety shoes at work				
31.	I use head protection like helmet at work				
32.	I use Eye protection like eye goggle at work				
33.	I use Hand protection like hand glove at work				
34.	I use Hearing protection like ear muff or ear plug at work				
35.	I use of Respiratory protection like nose mask at work				
36.	I use Fall Arrestors when working at height				
37.	I use work clothing like Coverall or work uniform at work				
38.	I ensure my work area is clean and orderly				
39.	I ensure that machine guards are in place				
40.	I correct other workers who do not follow safety rules				