ASSESSMENT OF OCCUPATIONAL SAFETY AND HEALTH MANAGEMENT PRACTICES IN AUTOMOBILE WORKSHOPS IN MINNA METROPOLIS, NIGER STATE

BY

SALAKO Oriyomi Sidikat
2017/3/67647TI

DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION
FEDERAL UNIVERSITY OF TECHNOLOGY MINNA

AUGUST, 2021

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A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION, FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA IN PARTIAL FULFILMENT FOR THE AWARD OF BARCHELOR OF TECHNOLOGY DEGREE (B.Tech) IN INDUSTRIAL AND TECHNOLOGY EDUCATION

AUGUST, 2021

DECLARATION

I **SALAKO ORIYOMI SIDIKAT**with matric number **2017/3/67647TI** an undergraduate student of the Department of Industrial and Technology Education certify that the work embodied in this project is original and has not been submitted in part or full for any other diploma or degree of this or any other University.

SALAKO ORIYOMI SIDIKAT _____

2017/3/67647TI Sign and Date

CERTIFICATION

This project has been read and approved as meeting the requirements for the award of B.Tech degree in Industrial and Technology Education, School of Science and Technology Education, Federal University of Technology, Minna.

Mrs. NWANKWO FRANCA.C. _____
(Project Supervisor) Sign and Date

Dr. I.Y UMAR _____
(Head of Department) Sign and Date

_____ _____
(External Examiner) Sign and Date

DEDICATION

I dedicate this work to God Almighty for His grace, care and compassion, His profound love made it possible for me to make it thus far in my academics.

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ABSTRACT

The research was designed to study the assessment of occupational safety and health management practices in automobile workshops in Minna metropolis Niger state. Five research questions were answered and five hypotheses tested at 0.05 level of significance were formulated for the study. A survey research design was adopted for this study. The major purpose of this study is to look at the types of occupational hazard and risks that automobile workshop mechanics are exposed to in Minna metropolis Niger state, the level of awareness of the occupational safety and health management practices that are peculiar to their job in Minna metropolis Niger state, the level of compliance of automobile workshop mechanics to occupational safety and health management practices and regulations as stipulated by occupational health and safety laws in Nigeria, the ways in which automobile workshop mechanics can carry out their jobs in a safe and healthy manner in devoid of accidents and injuries in Minna metropolis Niger state. The literature reviewed in line with the five research questions and the null hypotheses were formulated to guide the study in which several sub-headings were discussed as regard to the purpose of the study. The research design use for this study is survey research design in which questionnaire was formulated to solicit information from respondents. The targeted population of the study comprised of automobile workshop mechanics apprentice and master craftsmen in Minna metropolis Niger state. The total population of the study is 233 which consisted of 155 apprentice and 78 master craftsmen in automobile workshop in Minna metropolis Niger state. Data obtained was analyzed using mean, standard deviation, and t-test statistics. The study concluded and recommended the following: Government should ensure that automobile workshop mechanics apprentice and master craftsmen are aware of the various types of occupational hazard and risks that automobile workshop mechanics are exposed to in Minna Niger state. Government should ensure that automobile workshop mechanics comply with the occupational safety and health management practices and regulations as stipulated by occupational health and safety laws in Nigeria. Automobile mechanic master craftsmen should ensure that their apprentice are aware of the occupational safety and health management practices that are peculiar to their job in Minna metropolis Niger state. Government should ensure that automobile workshop mechanics are aware of the various ways in which automobile workshop mechanics can carry out their jobs in a safe and healthy manner in devoid of accidents and injuries in Minna metropolis Niger state so that occupational safety and health management practices in automobile workshop in Minna metropolis Niger state can in improve.

TABLE OF CONTENTS

LIST OF TABLES

Table

Page

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

Occupational health management is a system that tracks each incident that relates to employee health and safety. It integrates the entire plan of an organization into a unified whole that assumes complete responsibility for each employee. This means that it is concerned with prevention as it is with health care before and after an accident. The goal of Occupational Health and Safety is to do everything that can be done to prevent accidents and minimize illness.

Occupational health is the promotion and maintenance of the highest degree of physical, mental, and social well-being of workers in all occupations by preventing departure from departure health controlling risks and the adaptation of work to people and people to people to their jobs. (international labour organization and world health organization, 2015).

Globally, protection of workers against work-related injuries and illnesses has over the years been an issue of great concern to employees, workers, governments, and the general public. This is because a safe working environment does not only promote the physical, mental and social well-being of workers, but also saves cost associated with medical bills, compensation, work interruption, loss of experienced personnel, and others resulting from accidents at the workplace. The International Labor Organization (2015), estimates that every year approximately 270 million work-related accidents are recorded worldwide, resulting in the death of some 2 million people. Apart from the accidents resulting in fatalities, non-fatal accidents at the workplace, in some cases, leave victims with loss of body parts, skin diseases, musculoskeletal and reproductive disorders, cancer, mental and neurological illnesses, respiratory and cardiovascular diseases. Studies have shown that employees in

small and medium enterprises are more prone to work-related hazards and risks, (International Labour Organization, (2015).

Occupational health and safety is very essential in all works of life in order to avoid hazards and risks. The first session of International Labour Organization (ILO) and World Health Organization joint committee on occupational health safety held in 2010 as reported by Park, (2016) gave the following insights about occupational health and safety. Occupational health and safety is concerned with the promotion, sustenance and preservation of the total wellbeing of the workers in all occupations. It entails the prevention of diseases associated with the work environment and prevention of the worker from unsafe work environment, ensuring that the workers are physiologically and psychologically adapted to the work environment, in order to achieve high productivity, (USEPA, 2014). Some decades ago, occupational health and safety was not considered as important in relation to work place, hence the use of industrial health problems, until early 90's when it was seen as an important factor to be recognized in the work environment such as mercantile, forestry, trades and mechanics (Park, 2016).Since occupational safety and health administration (OSHA)'s creation in 1970, the nation has made substantial progress in occupational safety and health. OSHA and its many partners in the public and private sectors have: Cut the work-related fatality rate by 62 percent, reduced overall injury and illness rates by 42 percent, virtually eliminated brown lung disease in the textile industry, and Reduced trenching and excavation fatalities by 35 percent (Oak Ridge national laboratory, 2015).

OSHA uses three basic strategies, authorized by the Occupational Safety and Health Act, to help employers and employees reduce injuries, illnesses, and deaths on the job:Strong, fair, and effective enforcement; Outreach, education, and compliance assistance; and Partnerships and other cooperative programs.

Based on these strategies, OSHA conducts a wide range of programs and activities to promote workplace safety and health. The agency: Encourages employers and employees to reduce workplace hazards and to implement new safety and health management systems or improve existing programs; Develops mandatory job safety and health standards and enforces them through worksite inspections, employer assistance, and, sometimes, by imposing citations, penalties, or both; Promotes safe and healthful work environments through cooperative programs, partnerships, and alliances; Establishes responsibilities and rights for employers and employees to achieve better safety and health conditions; Supports the development of innovative ways of dealing with workplace hazards; Maintains a reporting and recordkeeping system to monitor job-related injuries and illnesses; Establishes training programs to increase the competence of occupational safety and health personnel; Provides technical and compliance assistance and training and education to help employers reduce worker accidents and injuries; Works in partnership with states that operate their own occupational safety and health programs; and Supports the Consultation Service (Fred, 2013). OSHA has recently updated the Guidelines for Safety and Health Programs it first released 30 years ago, to reflect changes in the economy, workplaces, and evolving safety and health issues. The new Recommended Practices have been well received by a wide variety of stakeholders and are designed to be used in a wide variety of small and medium-sized business settings. The Recommended Practices present a step-by-step approach to implementing a safety and health program, built around seven core elements that make up a successful program.

The main goal of safety and health programs is to prevent workplace injuries, illnesses, and deaths, as well as the suffering and financial hardship these events can cause for workers, their families, and employers. The recommended practices use a proactive approach to managing workplace safety and health. Traditional approaches are often reactive –that is,

problems are addressed only after a worker is injured or becomes sick, a new standard or regulation is published, or an outside inspection finds a problem that must be fixed. These recommended practices recognize that finding and fixing hazards before they cause injury or illness is a far more effective approach.

The idea is to begin with a basic program and simple goals and grow from there. If you focus on achieving goals, monitoring performance, and evaluating outcomes, your workplace can progress along the path to higher levels of safety and health achievement. Employers will find that implementing these recommended practices also brings other benefits. Safety and health programs help businesses: Prevent workplace injuries and illnesses, improve compliance with laws and regulations, reduce costs, including significant reductions in workers' compensation premiums, Engage workers, enhance their social responsibility goals, and Increase productivity and enhance overall business operations (Van, 2019)

The layout of the workshop itself also must be up to certain safety standards. The floor must be kept uncluttered and should provide easy access for walking. All spills should be cleaned up immediately, and tools and parts that are not being used should be put away. There are also broader regulations for the workshop layout, such as standards for electrical wiring.

One of the bigger hazards in auto workshops is flammability, and OSHA is known for citing auto workshops for not addressing this issue. Fire extinguishers and fire plans are expected, and auto workshops are supposed to have a flameproof booth for doing things such as spray finishing and using flammable materials (OSHA, 2020).

The recent deadly workshop accidents which occur in different part of Nigeria have been a major concern to all professionals in the automobile industry. This indicates that there is a need for strategies for improving safety and health in the automobile workshop. Therefore,

this study is to assess occupational safety and health management practice in automobile workshop in Minna metropolis, Niger state.

1.2 Statement of Problem

According to Occupational Safety and Health Council (2011), a clean and tidy workplace is essential to ensure the health and safety of the workers. Regularcleaning of workplaces, equipment and devices should be carried out to ensure an adequate level of workplace hygiene. A designated person should be assigned the responsibility to oversee such operations.

Roadside mechanics or artisans are ignorant of the health and safety hazards they are exposed to while working. Unsafe practices like sucking of fuel with the mouth, using bare hands to loose bolts and spray painting without goggles to protect the eyes, tightening of bolts without hand gloves among others are some of the occupational hazards and risks they are exposed to on a daily basis. therefore, this study will assess the occupational safety and health management practice in automobile workshop Minna metropolis Niger state.

1.3 Purpose of the Study

The purpose of this study is to assess the occupational safety and health management practice in automobile workshop in Minna Metropolis in Niger State. Specifically, the study is to:

1. To identify the types of occupational hazards and risks that automobile workshop mechanics are exposed to in minna metropolis, Niger State.
2. To assess the level of awareness of automobile mechanics of the occupational safety and health management practice in automobile workshop that are peculiar to their job in minna metropolis, Niger State.
3. To determine the types of injuries, illness and other occupational hazards that automobile workshop mechanics are prone to in minna metropolis, Niger State.

4. To ascertain the level of compliance of automobile workshop mechanics to occupational safety and health management practice and regulations as stipulated by occupational health and safety laws in Nigeria.
5. To suggest ways by which automobile workshop mechanics can carry out their jobs in a safe and healthy manner devoid of accidents and injuries in minna metropolis, Niger State.

1.4 Significance of the Study

The findings of this study will be beneficial to the automobile apprentice by educating them on the safety practices for reducing the accident rates and hazards on automobile workshop site thereby making the site a safe and healthy environment to work.

The findings of the study will bring to the notice of the automobile mechanics of Niger state the different hazard factors that are present and also equipped them with the relevant knowledge needed in identifying these hazards and their remedies, with this, automobile mechanics well-being will improve as there will be less exposure to dangers and accidents thus engaging in more output.

The findings of this study will benefit the government by helping them establish a basis source of revenue and improvement of the economy, most unemployed youths are put to work at the workshop without fear of sudden death or being permanently handicapped from accidents.

1.5 Scope of the Study

This study is delimited to the assessment of occupational safety and health management practice in automobile workshop in minna metropolis in Niger State. This study also covers the causes of occupational hazard and accident in automobile workshop, level of compliance of safety rules and regulations in automobile workshop and also techniques to be adopted in

order to improve occupational safety practices and management in automobile workshop in minna metropolis in Niger State.

1.6 Research Questions

The following research questions will guild the study:-

1. What are the types of occupational hazards and risks that automobile workshop mechanics are exposed to in Minna metropolis, Niger State?
2. What is the level of awareness of the occupational safety and health management practice that are peculiar to automobile mechanics in Minna metropolis, Niger State?
3. What are the types of injuries and illness that affect automobile mechanics in Minna metropolis, Niger State?
4. What are the level of compliance of automobile workshop mechanics to occupational safety and health management practice and regulations as stipulated by occupational health and safety laws in Nigeria?
5. What are the ways by which automobile workshop mechanics can carry out their jobs in a safe and healthy manner devoid of accidents and injuries in minna metropolis, Niger State?

1.7 Hypotheses

The following null hypothesis was formulated and will be tested at 0.05 level of significance.

HO_1: There will be no significant difference in the mean response on the types of occupational hazards and risks that automobile workshop mechanics are exposed to in minna metropolis, Niger State?

HO_2: There will be no significant difference in the mean response on the level of awareness of occupational safety and health management practices that peculiar to automobile mechanics in Minna metropolis, Niger State.

HO3: There will be no significant difference in the mean response on the types of injuries and illness that affect automobile mechanics in Minna metropolis, Niger State.

HO4: there will be no significant difference in the mean response on the level of compliance of automobile workshop mechanics to occupational safety and health management practices and regulations as stipulated by occupational health and safety laws in Nigeria.

HO_5: There will be no significant difference in the mean response on the ways by which automobile workshop mechanics can carry out their jobs in a safe and healthy manner devoid of accidents and injuries in minna metropolis, Niger State?

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The related literature shall be reviewed under the following sub-heading

1. The concept of occupational safety and health
2. Concept of automobile
3. Concept of safety in automobile workshop
4. Causes of accident in automobile workshop
5. Types of accident common to automobile workshop
6. Strategies for improving safety in automobile workshop
7. Review of Related Empirical Study
8. Summary of review of related literature

2.1 The concept of occupational safety and health

Occupational safety and health is the discipline concerned with ensuring the safety, health and welfare of employees, organization and others affected by works they undertake (such as customers, supplier, and member of the public) (ladies, 2016). He added that occupational safety and health interacts strongly with other discipline, such as ergonomics, toxicology, psychology, occupational medicine, industrial hygiene, education, engineering safety, etcetera. In other words, occupational health and safety emphasizes the physical, mental and social wellbeing of workers that is the 'whole person'. According to him occupational safety and health in its broadest sense should aim at:

1. The promotion and maintenance of the highest degree of physical, mental and social wellbeing of the workers in all occupations.

2. The prevention among workers of divers' effect on health due to conditions in their place of work.

3. The protection of workers from risk resulting from factors that are adverse in their health.

4. The planning and maintenance of workers in occupation adapted to physical and mental wellbeing.

The joint committee of occupational health further pointed out that the reasons for establishing good occupational safety and health are frequently identified as:

Moral: an employee should not have to risk injury or death at work, nor should others who are associated with the environment.

Economic: many governments realize that poor occupational safety and health performance result in cost to the state (for example, through social security payment to the in capacities cost of the medical treatments, and the loss of employability of workers). Employing organizations also sustain cost in the event of an accident at work (such as legal fees, fines, compensatory damages, investion time, lost production, lost goodwill from the work force from customers and from the wider community).

Legal: occupational safety and health requirement may be reinforced in the civil and/or criminal law. It is accepted that without extra "encouragement" of potential regulatory action or litigation, many organizations would not act upon their implied moral obligations. Under the occupational safety and health act 1991(the act) employers are required to provide and maintain as fast as practicable, a working environment that is safe and without risk to health. Yet, everyday auto mechanic face accidents that threaten their health and lives. However, these accidents are preventable and avoidable through proper safety and health measures at the workshop, and these depend largely upon the employers.

International labour organization Kama (2015) stated that health monitoring in workers in factories and other places of work is a vital aspect of occupational health and safety

measures. Various acts of law stipulate where exposure to a particular product will require either an annual or periodic examination. According to him, in the developing world, the monitoring of health in the workplace has just begun to be given attention as it deserves.

Kadiri (2018) asserted that as a result of lack of attention given to health and safety, work related accident and diseases and at the same time to recognize the connection between workers. Health and safety in the work place, and environment outside the workplace, successful occupational health and safety practice require the collaboration and participation of both employer and workers in health and safety programme.

2.2. The concept of automobile

Automobile is one of the streams of mechanical engineering. It deals with the various types of automobile, their mechanism of transmission systems and its applications. Automobile are the different types of vehicles used for transportation of passengers, goods etc. Basically all the types of vehicle work on the principle of internal combustion processes or sometimes the engines are called as internal combustion engines. Different types of fuels are burnt inside the cylinder at higher temperature to get the transmission motion in the vehicle. Most of the automobiles are internal combustion engine vehicles only.

Therefore, every mechanical and automobile engineer should have the knowledge of automobile engineering, it's mechanism and its various applications (George, 2017).

Automobile is a branch of engineering which deals with everything about automobile and practices to propel them. Automobile is a vehicle driven by an internal combustion engine and it is used for transportation of passengers and goods on the ground.

Automobile can also be defined as a vehicle which can move by itself. Example: car, jeep, bus, truck, scooter, etc.

2.3. Concept of safety in automobile workshop

Motor vehicle mechanic work is one of the technical vocational education (TVE) programs which involves the acquisition of scientific knowledge in design, selection of materials, construction, operation and maintenance of motor vehicles. The program of automobile work in Nigeria technical colleges is designed to produce competent motor vehicle craftsmen for Nigeria technical and industrial development (Aruku, 2014).

It also creates an avenue for technology advancement in Nigeria. To enhance these ego, zeal, potential and desire of these future professionals, highly skilled technical training must be attained. In other to train students to be highly skilled, the continuous use of the practical training workshop must be of good advantage as this builds them up and promotes the knowledge they have acquired before they enter into the real world of the labour market. But the aspect of safety must be taken into full consideration in order to answer to the government for a productive skill and manpower achievement.

When carrying out workshop activities, the most important thing that should be considered is safety in the workshop. This must be the center of attraction for all workshop attendants and practitioners. It should Not just be a concern of safety during the practical work in the workshop, but it should entail safety at all time, most especially when students come around the workshop for any other reasons other than their practical work.

Safety can be regarded as a habit or as a form of positive attitude. Safety Cannot happen on its own just like that, it comes as a result of human action, it is human who chooses safety as a priority during the cause of work or attendance that put it into effect, but for those who sees it as just an inscribed word takes it for granted. Safety rules in the workshop should be practiced from time to time. To avoid accidents in the workshop or any other place, one has to fully aware and careful. The teaching and learning of safety in the workshop should always

be practiced to ensure that students do not take it for granted. Simpson (2018) said awareness of safety practices in the workshop should be emphasized to students: because one can never know when unfortunate incidents will occur. Thus, students should make every effort to avoid any accident in the workshop.

According to Awake (2018), workshop safety is that should be the main focus in doing practical work in the workshop, it should be concern equally not only when doing practical work but also at any time when students are in the workshop.

Safety is defined as a condition free from injury, fear, pain, shock, danger or loss which requires appropriate action by all the bodies involved during the contact. Majority of accident occur as a result of man's carelessness, but a few number of accident occur as a result of other factors without interference of man. It is understood that accidents occur mostly in the workshop when practical work is in progress. The occurrence of the workshop accidents leads to bums, cuts, deformities and loss of life. The occurrence of the workshop accident in the automobile workshop will limit the main aim of the workshop settings, workshop practices and participation of the automobile mechanics.

safety awareness comes as a result of the desire to know and understand the use of workshop tools that are available. Tight corners and narrow spaces in the workshop when occupied by large number of students disrupt workshop activities and the workshop safety. Safety in the workshop is more complicated if there are too many number of workers using the space and existing facilities or equipment at one time.

2.4. Causes of accidents in automobile workshop

Accidents have serious effect upon an individual worker, equipment and production output. It causes a significant loss of time to the establishment both man, working hours and time to attend to the victim. It causes loss of money to the injured person, especially if he becomes incapacitated. Jain (2016) pointed out that accident affect the family of the victim, causing an anxiety to members. It becomes worst if the accident is fatal there by resulting to the death of the victim; his skills is lost forever, his family is directly broken up, his place in the workshop may take some time to be filled by a substitute, thus increasing a burden on the establishment where he worked.

However, accident can be avoided by taking certain measures of safety precautions. This has been the major concern of this research work, assessing the degree to which safety practices are carefully carried out by mechanics in automobile workshop in Minna Niger state, and the consequences of their actions in respect to safety practices in workshop. Onuoha (2011), Sara (2014) and Jain (2016) recorded the measures of avoiding accident in the workshop under this three categories:

1. Proper safety instruction which can be done by use of special classroom session, safety booklets, posters, films, safety contacts by safety specialists.

2. Enforcement of safety rules and regulations, safety working condition development, safety training of workshop instructors to enable them practice and impact safety education to the mechanics.

3. Provision of safety devices and creation of safety work habit on the personalized basis, promotion of students' participation in safety.

In the automobile workshops, there is a provision of workshop tools and equipment made available to mechanics in the workshop. An accident is usually an unplanned and unexpected event which results from a mistake somewhere, somehow and by somebody (Aniekwu, 2017). In 2015, more than 15,000 workers related injuries were reported by automobile alone. Add to this a possibly large number of unreported injuries, and the total figure could be more alarming. Unfortunately, some of these work related injuries are almost unavoidable, even when the best of precautions are taken by the automobile mechanics. Here is a look at some of the most common injuries and illnesses suffered by automobile.

2.4.1 Cuts and Burns

Automobile mechanics often fall prey to accidents at the workshop due to equipment tip-over, falls, or collapse, and suffer Auden injuries, such as cuts and burns. In fact, contact with Objects and equipment, such as automobile parts or tools accounted for around 44.5 percent of all injuries suffered by the automobile mechanics in 2015, according to the bureau of labor statistics. Also, cuts were the most common automobile workshop injury reported in 2011, according to a study published in the journal industrial Health. Some other common injuries include burns and fractures. While some of the accidents can be avoided by using safety equipment, not all of them are avoidable.

2.4.2 Cumulative trauma disorders

These are injuries caused by overexertion, strains, and sprains. Mechanics often need to lift heavy objects, strain their muscles, bend over and work for hours at a poor posture. As a result, they often suffer repetitive stress injuries or cumulative trauma disorders, such as muscle pulls, spinal, injuries, back sprains, elbow injuries, ulnar nerve entrapment, and carpal tunnel syndrome. In fact, one of out of every five injuries reported by the automobile

mechanic in 2015 was some form of repetitive trauma injuries, according to the Bureau of Labor Statistics.

The BSL data also revealed that heavy lifting accounted for more than 50 percent of all over exertion injuries in 2015. Most of these injuries can be avoided by using advanced tools for lifting heavier objects and by utilizing proper lifting techniques. Unfortunately, however, some musculoskeletal injuries are more severe than the others and may not always be avoided.

2.4.3 Toxic injuries

Automobile mechanics are also susceptible to long term illnesses caused by exposure to industrial chemicals and gasoline additives. For instance, some auto parts, such as, clutches and brakes may contain a harmful compound called asbestos, which triggers the risk of respiratory diseases and even cancer among the mechanics, says the environmental protection agency. Some other products used in a garage may contain lead. According to occupational safety and health administration (OSHA), contact with products containing lead may cause kidney diseases, anemia, neurological disorders, and even death.

2.5. Types of accidents common to automobile workshop

The probable occurrence of a work-related accident in industrial settings is a possible certainty. Simpson (2018) stated that the physical nature of the work combined with dangers with heavy machinery, movable objects, and harmful chemicals make the workshop environment one of the most dangerous for mechanics. Occurrence of accident in the workshop can be limited by the introduction of policies and procedures to reduce the risk of accidents and also to protect the mechanics. Further descriptions on the types of accidents common to automobile workshop include:

2.5.1. Electrical hazards: Electricity is one of the major causes of injuries, fatal accidents and fire accidents can happen when people touch part of a unit carrying live current. If the installation becomes faulty, even contact with part of a unit, which does not normally carry live current can lead to serious accident, electric current can also cause burns again, if the installation is faulty there is a short circuit, intense heat can develop leading to the possibility of a serious fire. The main electrical hazards are contact with live parts causing electric shock and burnt, fault which could cause fire, and fire or explosion where electricity could be the source of ignition in a potentially flammable or explosive atmosphere.

2.5.2. Mechanical hazards: Mechanical hazards are related to the machinery being used in the workshop. In any case the machinery or equipment being purchased must meet safety requirements, and preferably marked. All protection and guards, assessment and safety instruction must be included, and no extra protection should be needed for the operator. During the installation of a machine, care must be taken ensuring that all guards are properly fixed and used. It is important safety device not to constitute an obstacle to work, and not to hamper the maintenance services of the machine. Often, accidents happen when machines are accidentally started during assessment and repair work. Therefore, careful serving of machines is most important when it comes to work safety.

2.5.3. Chemical hazards: chemical hazards include compound LA or mixture of them that can produce adverse health effects under some conditions of exposure, rapidly reach a climax and usual recover quickly when exposures ceases. These effects include eye, nose and throat irritation, skin injuries and certain lung injuries, sub-acute or short term develops more gradually, usually on prolonged exposure, and tend to recover when exposure ceases, and chronic or long-term, which develop gradually over a prolonged period of exposure, and tend to recover extremely slowly. These effects include kidney damage, fetal damage, and

chemically induced cancers. Inhalation is the most common route of entry of aerial; gas, dust, vapour chemical into the body in a workshop, followed by absorption through the skin usually in case of liquids and by ingestion, the later route is the least important, provided that the rules of personal hygiene, such as eating at workplace washing hands before eating, etc. In addition to their toxicity and health effects, several chemical hazards present in an automobile workshop are flammable, e.g. petrol, engine oils, paints. Vents and accumulation of gases, vapour and dusts result in an explosive atmosphere. The accumulated substances mixed with air have the possibility to catch fire or explode.

2.5.4. Noise and vibration: automobile mechanics are exposed to excessive noise during different operations in automobile workshop. Such as noise levels from panel beating and other mechanic operations using hand tools are variable but generally high, noise during paint spraying, noise from work with sheet metal, noise from body repair work, noise from air grinders and hand transmitted vibration and vibration transmitted through the seat or feet.

2.5.5. Explosion and fire fighting: A variety of explosive materials exist in an automobile workshop. These can be waste oil that is stored in drums or tanks, other flammable liquid storage or use of paints, solvents, cleaning materials. Gases in cylinder, explosive dusts sanding organic fillers, other explosive materials air bags, seat belt parts, fine flammable dusts, which if ignited, can cause violent explosion and damage.

2.5.6. Electronic Radiation: welding operations are associated with the intense light that can cause serious and often permanent eye damage if students do not wear proper eye protection. The intensity of light or radiant energy produced by welding, cutting or brazing operations varies according to a number of factors including the task producing the light, the electrode size and the current. Slips and falls are the most common types of accidents found in the workshop which could result to bruises, cuts, strains and sprains poorly positioned tools and

tools that fall while they are being carried, industrial equipment can cause workshop accidents resulting to injuries or even death. These injuries affect mostly the head and neck, therefore preventive measures require use of safety head gear, proper restrained of carried or manipulated objects, proper training on equipment use and the display of warning signs.

2.6 Strategies for improving safety rules and regulations in an automobile workshop

Strategies for improving safety rules and regulations in an automobile workshop requires the use of safety wears like hand gloves, safety boots, helmets and goggles which are mandatory for workshop activities. Refusal to make use of goggles when welding affect the eyes and can result to temporal or permanent blindness because of the sparks that can destroy the tissues of the human eye. It has been said by Simpson (2018) that many mechanics who work in the workshop end up losing parts of their bodies like fingers and toes which occur as a result of improper dressing in the workshop. Wearing of overalls is one of the strategies adopted to correct the occurrence of accident in the automobile workshop any sensible mechanic does not joke with wearing of overall when working in the workshop Attah (2017). Examples of safety wears include workshop coats, safety boots, hand gloves, goggles, masks helmets etc. Without the workshop safety wears, mechanics should not be allowed into the workshop for any sought of activities.

Mechanics are therefore advised to carry out some common safety guidelines like pulling of hand brake, choking of gear wheels, jacking of the vehicle on a hard surface using spreading blocks for load spreading. Falls are the most common types of workshop resulting to bruises, cuts, strains, and sprains which are among common injuries that can result from falls. The use of non-slip mats should be used in front of machines where necessary and the machine should be sensibly placed to avoid overcrowding and suitable anchors to vibration. All the service records of the machines and equipment should be maintained as this will not only

save time but also help take care of repetitive break downs, keeping of tools and accessories should be done properly and accordingly as placing them anywhere will lead to chaos and inefficient working. Smoking and drinking should be prohibited in the workshop, the pathway must be cleaned and cleared on a regular basis. In terms of safety and fire precautions, mock security drills are conducted workshops are enclosed structures at all time of emergency mechanics participate in mock security whenever they are conducted because that is the best way to prepare mechanics for emergencies. Mechanics should ensure that an appropriate fire extinguisher is readily accessible when welding. A clear distinction should be Made known to mechanics between the water extinguisher and carbon dioxide extinguisher.

Proper training is advised so that no confusion arises at the time of emergency. Most importantly, every mechanic in the automobile workshop must know the contact number of ambulance and fire service. Above all, safety is the primary concern.

Secondly, improving work efficiency with minimum trouble is what workshop managers would like to achieve. Mohammed, (2019) and safety in the workshop will be more complicated if the number of mechanics are too many for the available space, facilities or existing equipment a time. Confined spaces as well as many students would exacerbate the workshop activities. It all the strategies for safety rules and regulations are observed and followed carefully, then one can achieve both the targets. It is always important to stay prepared for accidental emergency because trouble never comes announced and that's what automobile workshop safety does.

2.7 Review of Related Empirical Study

Onuha (2011) conducted a research on the assessment of occupational health and safety in motor vehicle repair workshop in Jeddah. This study aims to examine the occupational health and safety (OHS) status in motor vehicle repair workshops (MVRW) industry in the city of

Jeddah, Kingdom of Saudi Arabia (KSA). An inspection tool composed of 10 OHS components and 69 items was employed through observations, interviews, walk through survey and focused group discussions. The data was collected from local workshops (LWs, N=62) and multinational companies' workshops (CWs, N=11). The mean positive response for OHS components among surveyed LWs and CWs was as follow; personal protective equipment's (PPEs) (28% and 61%), fire protection and emergency management (52% and 91%), provision of facilities (69% and 94%), electric safety (44% and 82%), general workshop safety (43% and 82%), housekeeping (18% and 84%), chemical exposure (16% and 69%), maintenance and services (54% and 86%), manual handling (84% and 100%) and tool safety (58% and 91%), respectively. The overall OHS mean positive response, complying best practices and regulations, of all OHS elements in LWs was 47% which was much lower than 84% positive response for CWs. The impact of OHS on workers' health was also discussed together with recommendations given for further improvement.

Attah (2017) carried out a research on the pollution in Nigerian auto-mechanic village. The increasing number of malfunctioning automobiles with subsequent increase in emission levels and waste handling is an environmental concern in Nigeria. The spills from lubricants, gasoline, diesel and by-products of used and spent engine oil constitute the major pollutants in auto mechanic villages in Nigeria. Its environmental pollution has beenpredominant through soil and groundwater contamination andalso poses a major anthropogenic threat. The studied heavy metals on contaminated soil showed that studies had focused on common metals of Cu, Cd, Pband Zn in the east and west regions, while trace metals were studied in the south and radioactive elements in the north. Statistical evaluation showed high occurrences of Cu, Cd, Pb and Zn in the four geo-political zones of Nigeria. The detrimental effects of auto-mechanic village activities were on humans and also disrupted growth and flowering of arable plants. The remediation application showed that soil type and

contaminant characteristics play a major role in determining the type of remediation procedure to be applied. Hence, Nigeria should provide standard repairs and services to automobiles in-line with emerging technology and best environmental practices.

Mohammed (2019) conducted a research on the assessment of occupational health safety and environment (OHSE) of small and medium scale chemical manufacturing enterprise (SMCMES) in Enugu metropolis. There is increasing emphasis on safety and health at workplaces since work-related injuries and ill health can ruin lives and affect businesses. The study was aimed at assessing occupational health, safety and environment practices among the Small and Medium scale Chemical Manufacturing Enterprises (SMCME) in Enugu metropolis, Nigeria. A descriptive cross sectional study was carried out among 382 respondents randomly selected from SMCMEs in Enugu metropolis. Semi-structured questionnaire was used to assess the nature of work processes, environmental conditions and prevalence of workplace chemical injury/disease in the last 12 months. Most of the respondents operated both manual and mechanical (77%) process in their work activities. The workplace hazards observed were chemical hazards (33%), ergonomic hazards (21%), mechanical hazards (15%), physical hazards (14%) and psychosocial hazards (14%). Some common health problems were hand injury (12%) and respiratory tract infection (10%) and overall annual prevalence rate was 338 injuries/diseases per 1000 workers. Workers in SMCME are exposed to hazards due to their poor nature of work process. There is therefore high prevalence rate of preventable work related injuries/diseases. Employers should focus on training and installing safer work environment and government should enforce the practice of OHSE in SMCME.

2.8 Summary of Review of Related literature

The concept of safety in an automobile workshop is to prepare mechanics to be skilled, and productive member workforce to his immediate environment and to the society at large. By improving students with a safe working environment to facilitate skill acquisition, we promote auto mechanics creativity, respect for all and good working principles. An increase in industrialization has brought about a high number industrial related accidents.

The concept of workshop safety should have come before hand to safe guard and protect industrial worker from hazardous work environment which is occurring in an automobile workshop and industries, resulting to a frequent number of accidents. The causes of accidents come as a result of environmental factors, human factors and material or equipment factor, which cause biological disabilities to the victims, their families and economic meltdown of the society at large.

Therefore, the occurrence of accident in the automobile workshop can be avoided if the proper measures of safety precautions are practiced and applied, instruction on safety practices should be given to new auto mechanics in the form of orientation even before they start using or working in the workshop. Auto mechanics should practice safety rules and regulations as a collective action to create and maintain safe working environment.

Accident in an automobile workshop includes slip due to oil spillage in the floor which could cause fire outbreak or explosion where electricity could be the source of ignition I a potentially explosive atmosphere, contact with live parts causing electric shock and bums, vehicle inspection pits rolling roads and brake testing equipment, wheel alignment and balancing, vehicle testing, compressed air equipment, lifting equipment, cutting and welding processes, grinding machine and grinding wheels, painting, exhaust fumes from a running engine, used engine oils hydrogen emitted from batteries, petrol, body filters, asbestos.

Brake and clutch linings, welding and cutting fumes, noise level from Panel beating and other repair operations using hand tools are variable but generally high. Safety education and the development of Workshop safety, safety awareness is regarded as the steps in practicing. Applying, maintaining and assessing a healthy working environment. Automobile mechanics should be acknowledged for their safety education by praising, commenting and making correction where applicable.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

This chapter describes Research design, Area of study, population of the study, Instrument for data collection, Validation of the instrument, Administration of the instrument, Method of data analysis and Decision rules respectively.

3.1 Research Design

The research design adopted for this study was a descriptive survey research design. Questionnaire was used to elicit opinions of respondents on the assessment of occupational safety and health management practices in automobile workshops in minna metropolis, Niger State. Olaitan and Nwoke (2010), define a survey research design as a descriptive study which the entire population or representative sample of the entire population is studied by collecting and analyzing data from the group through the use of questionnaires. The survey design is therefore considered suitable since the study seeks information from a sample that was drawn from a population using a questionnaire.

3.2 Area of the study

The study was carried out in all the areas in minna metropolis. Namely: Bosso, Chanchaga, Kpakugun, Maitumbi, Mainkukele, Minna central, and Tunga respectively.

3.3 Population of the Study

The population of this study is two hundred and thirty-three (233) respondents, comprising of 155 apprentice and 78 automobile mechanics master craftsmen.

3.4 Sample and Sampling Techniques

since the total population is of manageable size, the entire population was used for the study, hence no sampling technique was used for the study.

3.5 Instrument for data Collection

The instrument used for data collection is the questionnaire which is the assessment of occupational safety and health management practices in automobile workshops in minna metropolis, Niger State. The questionnaire is to determine the opinion of the respondents that comprises of the automobile mechanic master craftsmen and their apprenticesin minna metropolis, Niger State. The questionnaire is divided into two parts (i and ii). Part i consist of respondents "personal data", containing information about status, age, and part ii is grouped into (A,B,C and D) where question A consist of 15 items which sought to elicit information about the types of occupational hazard and risks that automobile workshop mechanics are exposed to in minna metropolis, Niger State, sub-section B consist of 12 items which sought to elicit information if automobile workshop mechanics have any awareness of occupational safety and health management practice that are peculiar to their jobs in minna metropolis, Niger State, sub-section C consist of 10 items which sought to elicit information on the level of compliance of automobile workshop mechanics to occupational safety and health management practice and regulations as stipulated by occupational health and safety laws in Nigeria in minna metropolis, Niger State and sub-section D consist of 10 items which elicit information on the ways by which automobile workshop mechanics can carry out their jobs in a safe and healthy manner devoid of accidents and injuries in minna metropolis, Niger state.

3.6 Validation of the Instrument

The instrument for the data collection was designed by the researcher and was validated by three lectures in the Department of Industrial and Technology Education (I.T.E), federal university of technology minna, Niger state. The validators were requested to check the suitability and clarity of the item who found it appropriate for the study before administering.

3.7 Administration of the Instrument

The instrument used for data collection was administered to the respondent by the researcher and a researcher assistant within the study area selected for this research.

3.8 Method of Data Analysis

The data collected by the researcher was analyzed using mean, standard deviation and t-test as statistical tools. A four-point rating scale was employed with the following response.

Alternative value		Abbreviation	Rating
Strongly Agree	=	“SA"	4
Agree	=	“A”	3
Disagree	=	“D”	2
Strongly Disagree	=	"SD"	1

$\frac{4+3+2+1}{4} = \frac{10}{4} = 2.5$

The mean response of each item was obtained by using the following formula

$$\overline{X}_1 \frac{\sum FX}{N}$$

Where

£ = Summation of

X = normal value of option (mean)

N = number of response of an item

F = frequency of response of each option

$\overline{X}_2$=Grand mean of each item

Decision Rule

To determine the level of acceptance, mean response. 2.50 and above was considered agreed or accepted. While mean response of 2.49 and below was equally considered disagreed or rejected. For testing hypothesis ± 1.65 will be the critical value, any item that has its t- value

equal or less than t- critical was considered not significant, and any item that has its calculated t- value above t-critical was considered significant.

CHAPTER IV

PRESENTATION AND DATA ANALYSIS

This chapter deals with the presentation and analysis of data with respect to the research questions formulated for this study, the result of this data analysis for the research questions are presented first, followed by those of the hypotheses tested for the study.

4.1.1 Research Question One

What are the types of occupational hazards and risk that automobile workshop mechanics are exposed to in Minna metropolis, Niger State?

Table 4.1.1: mean response on the What are the types of occupational hazards and risk that automobile workshop mechanics are exposed to in Minna metropolis, Niger State. N1=155, N2=78.

S/N	ITEMS	X1	X2	t	Remark
1	Noise and vibration hazards	3.42	3.83	1	Agreed
2	Heat hazards	3.53	3.03	3	Agreed
3	Chemical hazards	3.73	3.63	7	Agreed
4	Fire accidents	3.53	3.63	6	Agreed
5	Electrical shock	3.63	3.13	4	Agreed
6	Slips and fall	3.23	3.33	3	Agreed
7	Mechanical hazards	3.63	3.43	5	Agreed
8	Electrical radiations	3.83	3.53	5	Agreed
9	Oil spillage	3.83	3.53	8	Agreed
10	Respiratory hazards	4.03	3.73	9	Agreed
11	Vehicle accidents	3.42	3.83	1	Agreed
12	Machinery malfunction	3.53	3.03	3	Agreed
13	Falling object	3.73	3.63	7	Agreed
14	Poor housekeeping	3.53	3.63	6	Agreed
15	Slippery/wet floors	3.63	3.13	4	Agreed

KEY: X1= average mean responses of automobile mechanic apprentice, X2= average mean responses of automobile mechanic master craftsmen, N1= number of number of automobile mechanic apprentice, N2= number of automobile mechanic master craftsmen.

Table 4.1.1 reviews that the respondents agreed with item1,3,4,5,6,7,8,9,10,11,12,13,14 and 15 with a mean score above 2.50 respectively. While none disagreed with a mean score below 2.50. This means that item 1,3,4,5,6,7,8,9,10,11,12,13,14 and 15 agreed to the types of

occupational hazards and risks that automobile workshop mechanics are exposed to in Minna metropolis, Niger State.

4.1.2 Research Question Two:

What is the level of awareness of the occupational safety and health management practice that are peculiar to automobile mechanics in Minna metropolis, in Niger State?

Table 4.1.2 Mean responses of the respondents on the level of awareness of the occupational safety and health management practice that are peculiar to automobile mechanics in Minna metropolis, Niger State. N1= 155, N2=78

S/N	ITEMS	X_1	X_2	X_t	Remark
1	Use of wrong capacity fuse may cause injury and damage equipment	3.1	2.8	3.0	Agreed
2	Automobile source of environmental contaminants that are very toxic to humans	2.0	1.8	1.9	Disagreed
3	Lack of concentration while working with automobile by automobile mechanics and apprentices can lead to accident	2.9	2.8	2.9	Agreed
4	Personal protective equipment are usually considered a luxury and rarely provided	2.8	2.7	2.8	Agreed
5	Inadequate connections will lead to overheating and can result to severe burns and fire.	3.3	2.9	3.1	Agreed
6	Bodies which have contact with chemical can cause burn	2.9	2.7	2.8	Agreed
7	Automobile hazard can kill	2.6	2.8	2.7	Agreed
8	Hazard result due to improper bolting automobile parts.	2.5	3.0	2.8	Agreed
9	Spraying of commonly used chemicals such as Polyisocyanates can cause airborne	2.8	2.7	2.8	Agreed
10	Safety clothing's are necessary to protect the automobile expert from hazards	2.9	2.8	2.9	Agreed
11	Persons working in the vicinity of an automobile workshop, including other workshops can cause discomfort by stray radiation from welding auto parts.	1.8	2.0	1.9	Disagreed
12	Hazards result due to rusted or damaged bolting of automobile parts	3.1	2.8	3.0	Agreed

KEY: X1= average mean responses of automobile mechanic apprentice, X2= average mean responses of automobile mechanic master craftsmen, N1= number of number of automobile mechanic apprentice, N2= number of automobile mechanic master craftsmen.

Table 4.1.2 shows that both respondents agreed on the level of awareness of the occupational safety and health management practice that are peculiar to automobile mechanics in Minna metropolis, Niger State, item 1,3,4,5,6,7,8,9,10 and 12 as reflected by their own mean score greater than 2.50 respectively. While 2 and 11 disagreed.

4.1.3 Research Question Three

What are the types of injuries and illness that affect automobile mechanics in Minna metropolis, Niger State?

Table 4.1.3 Mean responses of the respondents on the types of injuries and illness that affect automobile mechanics in Minna metropolis, Niger State. N1= 155, N2=78

S/N	ITEMS	X1	X2	Xt	Remark
1	Cuts burns	2.7	2.5	2.6	Agreed
2	Trauma disorder	1.9	2.1	2.0	Disagreed
3	Kidney diseases	3.1	2.9	3.0	Agreed
4	Anemia	2.4	2.9	2.7	Agreed
5	Neurological disorder	2.9	2.8	2.9	Agreed
6	Death	3.3	2.9	3.1	Agreed
7	Electric shock	3.8	3.0	3.4	Agreed
8	Eyes irritation	3.2	3.8	3.5	Agreed
9	Skin injuries	2.9	2.9	2.9	Agreed
10	Chemically induced cancer	3.3	2.8	3.1	Agreed

KEY: X1= average mean responses of automobile mechanic apprentice, X2= average mean responses of automobile mechanic master craftsmen, N1= number of number of automobile mechanic apprentice, N2= number of automobile mechanic master craftsmen.

Table 4.1.3 shows that both respondents agreed on the types of injuries and illness that affect automobile mechanics in Minna metropolis, Niger State, item 1,3,4,5,6,7,8,9 and 10 as reflected by their own mean score greater than 2.50 respectively. While item 2 disagreed with the mean score below 2.50.

4.1.4 Research Question Four

What are the level of compliance of automobile workshop mechanics to occupational safety and health management practice and regulations as stipulated by occupational health and safety laws in Nigeria?

Table 4.1.4 Mean responses of the respondents on the level of compliance of automobile workshop mechanics to occupational safety and health management practice and regulations as stipulated by occupational health and safety laws in Nigeria. N1= 155, N2=78

S/N	ITEMS	X1	X2	Xt	Remark
1	Dangerous chemical are kept safe	3.3	2.8	3.1	Agreed
2	Adequate ventilations	2.9	2.8	2.8	Agreed
3	The work environment is free from hazards	3.8	3.0	3.4	Agreed
4	Lightening are provided where necessary	3.2	3.8	3.5	Agreed
5	The tools are always return to their racks after use	3.3	2.9	3.1	Agreed
6	Mechanics always wear proper dress in the workshop	2.9	2.8	2.9	Agreed
7	Mechanics carry sharp tools like chisel, scriber, screw driver in their pocket	2.4	2.9	2.7	Agreed
8	Automobile mechanics rest on workshop machine	3.1	2.9	3.0	Agreed
9	Hand files use by mechanics are without handles	1.9	2.1	2.0	Disagreed
10	Waste materials are disposed.	2.7	2.5	2.6	Agreed

KEY: X1= average mean responses of automobile mechanic apprentice, X2= average mean responses of automobile mechanic master craftsmen, N1= number of number of automobile mechanic apprentice, N2= number of automobile mechanic master craftsmen.

Table 4.1.4 shows that both respondents agreed on the level of compliance of automobile workshop mechanics to occupational safety and health management practice and regulations as stipulated by occupational health and safety laws in Nigeria, item 1,2,3,4,5,6,7,8, and 10 as

reflected by their own mean score greater than 2.50 respectively. While item 7 disagreed with the mean score below 2.50.

4.1.5 Research Question Five

What are the ways by which automobile workshop mechanics can carry out their jobs in a safe and healthy manner devoid of accidents and injuries in minna metropolis, Niger State?

Table 4.1.5 Mean responses of the respondents on the ways by which automobile workshop mechanics can carry out their jobs in a safe and healthy manner devoid of accidents and injuries in minna metropolis, Niger State N1= 155, N2=78

S/N	ITEMS	X1	X2	Xt	Remark
1	Provision of protective equipment e.g hand gloves/paddling to reduce frictional effects of forceful griping	3.3	2.9	3.1	Agreed
2	Organizing lectures and seminars on automobile safety of automobile mechanics	2.9	2.7	2.8	Agreed
3	Printed media such as newspaper, magazines can carry information on safety and healthy manner to avoid accidents in an automobile workshop	2.6	2.8	2.7	Agreed
4	Broadcasting on radio through news and advertisement on safety of automobile mechanics is very important	2.5	3.0	2.8	Agreed
5	Posters carrying safety signs can be placed on conscious places.	2.8	2.7	2.8	Agreed
6	Orientation can be arranged for automobile mechanics in their work place by environmental and health agencies in Niger state.	2.9	2.8	2.9	Agreed
7	Approved protective wears are worn by technicians	1.8	2.0	1.9	Disagreed
8	Facilities for the training of automobile mechanics in workshops should be made available in Niger state	3.1	2.8	3.0	Agreed
9	Automobile safety awareness can reach automobile mechanics through the use of Global system for mobile communication (GSM) bulk SMS (short message service)	3.3	2.9	3.1	Agreed
10	Vision and mission of automobile mechanics should be enforcing in automobile workshop.	2.9	2.7	2.8	Agreed

KEY: X1= average mean responses of automobile mechanic apprentice, X2= average mean responses of automobile mechanic master craftsmen, N1= number of number of automobile mechanic apprentice, N2= number of automobile mechanic master craftsmen.

Table 4.1.5 shows that both respondents agreed on the ways by which automobile workshop mechanics can carry out their jobs in a safe and healthy manner devoid of accidents and injuries in minna metropolis, Niger State, item 1,2,3,4,5,6,8,9 and 10 as reflected by their

own mean score greater than 2.50 respectively. While item 7 disagreed with the mean score below 2.50.

4.2 Testing of Hypotheses

4.2.1 Hypotheses One:

There will be no significant difference in the mean response on the type of occupational hazards and risks that automobile workshop mechanics are to in Minna metropolis, Niger State.

Table 4.2.1 mean responses of automobile mechanic apprentice and automobile mechanic master craftsmen on the types of occupational hazards and risks that automobile workshop mechanic are exposed to in Minna metropolis, Niger State

S/N	ITEMS	SD1	SD2	t-test	Remark
1	Noise and vibration hazards	1.10	1.14	-0.52	A
2	Heat hazards	0.75	0.94	1.30	A
3	Chemical hazards	0.56	0.65	0.00	A
4	Fire accidents	0.56	0.30	1.57	A
5	Electrical shock	0.21	0.51	0.64	A
6	Slips and fall	0.53	0.66	0.46	A
7	Mechanical hazards	1.02	1.04	0.28	A
8	Electrical radiations	0.49	0.30	0.84	A
9	Oil spillage	0.05	0.40	0.83	A
10	Respiratory hazards	0.41	0.30	0.89	A
11	Vehicle accidents	0.14	0.47	0.70	A
12	Machinery malfunction	0.31	0.30	0.00	A
13	Falling object	0.64	0.22	-2.46	NA
14	Poor housekeeping	0.57	0.40	-0.66	A
15	Slippery/wet floors.	0.53	0.40	-0.68	A

Key
SD1= Standard deviation of teachers in technical colleges
SD2= Standard deviation of students in technical colleges
A= Accepted
NA= Not Accepted

The result shown in table 4.2.1 above indicates the Comparism between the apprentice and master craftsmen in the automobile workshop. Data revealed that items 1,2,3,4,5,6,7,8,9,10,11,12,14 and 15 has a calculated t-value less than the t-critical value of ±1.6, hence hypothesis for these items were upheld at 0.05 level of significance. Expect for item 13 which has a t-calculated value above the t-critical value ±1.66, thus HO was not accepted for this items.

4.2.2 Hypothesis Two

There will be no significant difference in the mean response of the level of awareness of occupational safety and health management practices that are peculiar to automobile mechanics in Minna metropolis, Niger State.

Table 4.2.2: t-test analysis of the respondents on the level of awareness of occupational safety and health management practices that are peculiar to automobile mechanics in Minna metropolis, Niger State.

S/N	ITEMS	SD1	SD2	t-test	Remark
1	Use of wrong capacity fuse may cause injury and damage equipment	0.46	0.40	-0.71	A
2	Automobile source of environmental contaminants that are very toxic to humans	0.23	0.30	0.00	A
3	Lack of concentration while working with automobile by automobile mechanics and apprentices can lead to accident	0.59	0.47	-0.58	A
4	Personal protective equipment are usually considered a luxury and rarely provided	1.01	1.00	-0.58	A
5	Inadequate connections will lead to overheating and can result to severe burns and fire.	0.68	0.40	0.00	A
6	Bodies which have contact with chemical can cause burn	0.44	0.40	-0.72	A
7	Automobile hazard can kill	0.51	0.69	1.34	A
8	Hazard result due to improper bolting automobile parts.	0.77	0.75	0.00	A
9	Spraying of commonly used chemicals such as Polyisocyanates can cause airborne	0.61	1.10	0.87	A
10	Safety clothing's are necessary to protect the automobile expert from hazards	0.58	0.87	1.08	A
11	Persons working in the vicinity of an automobile workshop, including other workshops can cause discomfort by stray radiation from welding auto parts.	0.46	0.40	-0.71	A
12	Hazards result due to rusted or damaged bolting of automobile parts	0.23	0.30	0.00	A

Table 4.2.2: Present test of this hypotheses
Key
SD1= standard deviation of teachers in technical colleges
SD2= standard deviation of students in technical colleges
A= accepted
NA= not accepted

The result shown in table 4.2.2 above indicates the Comparism between the automobile mechanic apprentice and automobile mechanic master craftsmen. Data revealed that item 1,2,3,4,5,6,7,8,9,10,11 and 12 has a calculated t-value less than the t-critical value of ±1.65 hence the hypothesis for this items were upheld at 0.05 level of significance. While none accepted, thus the null hypothesis for this items were not accepted.

4.2.3 Hypothesis Three

There will be no significant difference in the mean response on the type of injuries and illness that affect automobile mechanics in Minna metropolis, Niger State.

Table 4.2.3: t-test Analysis on the Response of automobile mechanic apprentice and automobile mechanic master craftsmen on the type of injuries and illness that affect automobile mechanics in Minna metropolis, Niger State.

S/N	ITEMS	SD1	SD2	t-test	Remark
1	Cuts burns	0.46	0.30	-1.71	NA
2	Trauma disorder	0.23	0.65	3.01	NA
3	Kidney diseases	1.05	0.68	-3.02	NA
4	Anemia	0.88	0.40	1.08	A
5	Neurological disorder	0.99	1.14	0.79	A
6	Death	0.58	0.94	0.67	A
7	Electric shock	1.10	0.69	-9.16	NA
8	Eyes irritation	0.53	0.51	1.39	A
9	Skin injuries	0.72	0.52	0.00	A
10	Chemically induced cancer	0.91	0.51	-3.30	NA

Table 4.2.3: Present test of this hypotheses
Key
SD1= standard deviation of teachers in technical colleges
SD2= standard deviation of students in technical colleges
A= accepted
NA= not accepted

The result shown in table 4.2.3 above indicates the comparism between the automobile mechanic apprentice and automobile mechanic master craftsmen. Data revealed that item 4,5,6.8 and 9 has a calculated t-value less than t-critical value of ±1.65, hence the hypothesis for these items were upheld at 0.05 level significance, expect for item 1,2,3,7, and 10 which has a t-calculated value above the t-critical value of ±1.65, thus the null hypothesis is for these items were not accepted.

4.2.4 Hypothesis Four

There will be no significant difference in the mean response on the level of compliance of automobile workshop mechanics to occupational safety and health management practices and regulations as stipulated by occupational health and safety laws in Nigeria.

Table 4.2.4: t-test Analysis on the Response of automobile mechanic apprentice and automobile mechanic master craftsmen on the level of compliance of automobile workshop mechanics to occupational safety and health management practices and regulations as stipulated by occupational health and safety laws in Nigeria.

S/N	ITEMS	SD1	SD2	t-test	Remark
1	Dangerous chemical are kept safe	0.53	0.40	-0.68	A
2	Adequate ventilations	0.57	0.40	-0.66	A
3	The work environment is free from hazards	0.64	0.22	-2.46	NA
4	Lightening are provided where necessary	0.31	0.30	0.00	A
5	The tools are always return to their racks after use	0.14	0.47	0.70	A
6	Mechanics always wear proper dress in the workshop	0.41	0.30	0.89	A
7	Mechanics carry sharp tools like chisel, scriber, screw driver in their pocket	0.05	0.40	0.83	A
8	Automobile mechanics rest on workshop machine	0.49	0.30	0.84	A
9	Hand files use by mechanics are without handles	1.02	1.04	0.28	A
10	Waste materials are disposed.	0.53	0.66	0.46	A

Table 4.2.4: Present test of this hypotheses

Key

SD1= standard deviation of teachers in technical colleges

SD2= standard deviation of students in technical colleges

A= accepted

NA= not accepted

The result shown in table 4.2.4 above indicates the comparism between the automobile mechanic apprentice and automobile mechanic master craftsmen. Data revealed that item

1,2,4,5,6,7,8,9 and 10 has a calculated t-value less than t-critical value of ±1.65, hence the hypothesis for these items were upheld at 0.05 level significance, expect for item 3 which has a t-calculated value above the t-critical value of ±1.65, thus the null hypothesis is for these items were not accepted

4.2.5 Hypothesis Five

There will be no significant difference in the mean response on the ways by which automobile workshop mechanics can carry out their jobs in a safe and healthy manner devoid of accidents and injuries in Minna metropolis, Niger State.

Table 4.2.5: t-test Analysis on the Response of automobile mechanic apprentice and automobile mechanic master craftsmen on the ways by which automobile workshop mechanics can carry out their jobs in a safe and healthy manner devoid of accidents and injuries in Minna metropolis, Niger State.

S/N	ITEMS	SD1	SD2	t-test	Remark
1	Provision of protective equipment e.g hand gloves/paddling to reduce frictional effects of forceful griping	0.58	0.87	1.08	A
2	Organizing lectures and seminars on automobile safety of automobile mechanics	0.61	1.10	0.87	A
3	Printed media such as newspaper, magazines can carry information on safety and healthy manner to avoid accidents in an automobile workshop	0.77	0.75	0.00	A
4	Broadcasting on radio through news and advertisement on safety of automobile mechanics is very important	0.51	0.69	1.34	A
5	Posters carrying safety signs can be placed on conscious places.	0.44	0.40	-0.72	A
6	Orientation can be arranged for automobile mechanics in their work place by environmental and health agencies in Niger state.	0.68	0.40	0.00	A
7	Approved protective wears are worn by technicians	1.01	1.00	-0.58	A
8	Facilities for the training of automobile mechanics in workshops should be made available in Niger state	0.59	0.47	-0.57	A
9	Automobile safety awareness can reach automobile mechanics through the use of Global system for mobile communication (GSM) bulk SMS (short message service)	0.23	0.30	0.00	A
10	Vision and mission of automobile mechanics should be enforcing in automobile workshop.	0.46	0.40	-0.71	A

Table 4.2.4: Present test of this hypotheses
Key
SD1= standard deviation of teachers in technical colleges
SD2= standard deviation of students in technical colleges
A= accepted
NA= not accepted

The result shown in table 4.2.5 above indicates the comparism between the automobile mechanic apprentice and automobile mechanic master craftsmen. Data revealed that item 1,2,3,4,5,6,7,8,9 and 10 has a calculated t-value less than t-critical value of ±1.65, hence the hypothesis for these items were upheld at 0.05 level significance.

4.3 Findings of the Study

The following are the principle findings of the study, they are organized based on the research questions and hypothesis.

The findings related to the types of occupational hazards and risks that automobile workshop mechanics are exposed to in Minna metropolis, Niger State?

Majority of the respondents agreed that Noise and vibration hazards, Heat hazards, Chemical hazards, Fire accidents, Electrical shock, Slips and fall are types of occupational hazards and risks that automobile workshop mechanics are exposed to in minna metropolis, Niger State.

The findings related to the level of awareness of the occupational safety and health management practice that are peculiar to automobile mechanic in Minna metropolis, Niger State.

Majority of the respondents agreed that the Use of wrong capacity fuse may cause injury and damage equipment, Lack of concentration while working with automobile by automobile mechanics and apprentices can lead to accident, Personal protective equipment is usually considered a luxury and rarely provided Inadequate connections will lead to overheating and can result to severe burns and fire, Bodies which have contact with chemical can cause burn and Automobile hazard can kill Hazard result due to improper bolting automobile parts the

level of awareness of the occupational safety and health management practice that are peculiar to automobile mechanic in Minna metropolis, Niger State.

The findings related to types of injuries and illness that affect automobile mechanics in Minna metropolis, Niger State?

Majority of the respondents agreed that Cuts burns, Kidney diseases, Anemia, Neurological disorder and Death are the injuries and illness that affect automobile mechanics in minna metropolis, Niger State.

The findings related to the level of compliance of automobile workshop mechanics to occupational safety and health management practice and regulations as stipulated by occupational health and safety laws in Nigeria.

Majority of the respondents agreed that Dangerous chemical are kept safe, Adequate ventilation, the work environment is free from hazards, Lightening are provided where necessary, the tools are always return to their racks after use and mechanics always wear proper dress in the workshop are the level of compliance of automobile workshop mechanics to occupational safety and health management practice and regulations as stipulated by occupational health and safety laws in Nigeria.

The Findings related to the ways by which automobile workshop mechanics can carry out their jobs in a safe and healthy manner devoid of accidents and injuries in minna metropolis, Niger State.

Majority of the respondents agreed that Provision of protective equipment e.g hand gloves/paddling to reduce frictional effects of forceful griping, organizing lectures and seminars on automobile safety of automobile mechanics, printed media such as newspaper, magazines can carry information on safety and healthy manner to avoid accidents in an automobile workshopand broadcasting on radio through news and advertisement on safety of automobile mechanics is very important are the ways by which automobile workshop

mechanics can carry out their jobs in a safe and healthy manner devoid of accidents and injuries in minna metropolis, Niger State.

4.4 Discussion of the findings

The discussion of findings Are based on the research questions posed for the study and the hypothesis. The findings in table 1 related to research question 1 revealed that the respondents agreed with the majority of items as a process of identifying the various types of occupational hazards and risks that automobile workshop mechanics are exposed to in minna metropolis. The findings also revealed that automobile mechanics should be conscious of machine malfunction, slippery floor, respiratory hazards, oil spillage, falling object as these are some of the occupational hazards they are to face in their workshops (Van, 2019). The implication of the findings discovered that when an automobile workshop is well managed and clean it will improve the safety of mechanics working in the workshop in minna metropolis.

The findings in table 2 related to research question 2 revealed that the respondents agreed with the majority of items on thelevel of awareness of the occupational safety and health management practice that are peculiar to automobile mechanics in Minna metropolis, Niger State. The findings revealed that most of the automobile mechanics are unaware of some source of environmental contaminants that are very toxic to human health. It also revealed the automobile mechanics are also unaware of the use of wrong capacity fuse which may cause injury and damage equipment (OSHA, 2020). The implication of the findings discovered that when proper orientation is given to these mechanics on the essence of occupational safety and health management practice, it will help them to be aware of this hazards and also improve their knowledge on safety management practices.

The findings in table 3 related to research question 3 revealed that the respondents agreed with the majority of items on thetype of injuries and illness that affect automobile mechanics

in Minna metropolis, Niger State. The findings revealed that trauma disorder, Anemia, kidney diseases, death, skin injuries are some of the injuries and illness that affect automobile mechanics if proper safety measures are not taken (Park, 2016). The implications of the findings revealed that when are proper safety equipment in the workshop it will help improve the well-being of the mechanics making use of the workshop.

The findings in table 4 related to research question 4 revealed that the respondents agreed with the majority of items on thelevel of compliance of automobile workshop mechanics to occupational safety and health management practice and regulations as stipulated by occupational health and safety laws in Nigeria? The findings revealed that most of the automobile workshops in minna metropolis are complying to the occupational safety and health management practice and regulations as stipulated by occupational health and safety laws in Nigeria on the adequacy of ventilation, proper lightening in the workshop, proper arrangement of tool in their racks after use (Kadiri, 2018).

The findings in table 5 related to research question 5 revealed that the respondents agreed with the majority of items on theways by which automobile workshop mechanics can carry out their jobs in a safe and healthy manner devoid of accidents and injuries in minna metropolis, Niger State. The findings revealed that there is need for provision of protective equipment, organizing lectures and seminar for automobile mechanics on automobile safety, pasting posters carrying safety signs on conscious places in the workshops will help automobile mechanics in safe and healthy manner (Attah, 2017).

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter deals with summary, conclusion and recommendations based on the findings. Suggestions for further studies were also highlighted.

5.1 Summary of the Study

The research was conducted to assess the occupational Safety and health management practice in automobile workshop in Minna metropolis Niger state. The study used a survey design method and sought to assess safety practices of automobile workshop in Minna Niger state. Five research questions were generated based on the purpose of the study, the literatures related to the study were reviewed. A structured questionnaire was developed by the researcher. The instrument was in five sections and it was validated and used to get information from respondents. The population of the study was 233 people which are made up of 155 automobile mechanic apprentice and 78 automobile mechanic craftsmen. A total of 233 questionnaires were distributed with 100% return rate.

Data collected on the structured questionnaire were analyzed using mean statistic. Unsafe acts of Automobile mechanics were discovered to cause most accidents in automobile workshop. The rate of occurrence of accidents can be reduced if provision of protective equipment a maid such as hand gloves. Organizing lectures and seminar on automobile safety of automobile mechanics has been discovered as one of the ways by Which automobile mechanics can carry out their jobs in a safe and healthy manner.

5.2 Implications of the Study

From the result gotten from the analysis of data, some implications of the study have been revealed. The automobile mechanics are now aware of the occupational safety and health management practices that are peculiar to their job, the common types of occupational hazard and risks that automobile workshop mechanics are exposed to and the ways by which

automobile workshop mechanics can carry out their jobs in a safe and healthy manner in devoid of accidents and injuries. Automobile mechanic apprentice and master craftsmen will be able to state out the strategies to be carried out to ensure automobile mechanics compliance to safety practices in automobile workshop. The Proper management of automobile workshop Will be able to save money in regards to the provision of wasted materials, damaged tools and equipment which occurs as a result of accidents in the automobile workshop. This will also reduce the cost of expenses on the supply of first aid and consumable if there is adequate assessment and health management practices in the workshop.

5.3 Contribution to Knowledge

The result of this study will be of immense benefit to the master craftsmen and their apprentices on the need of occupational safety and health management practices in automobile workshop in Minna metropolis Niger state. This research Work will benefit the government by helping them establish a base source of revenue and improvement of the economy, most unemployed youths are put to work at the workshop without fear of sudden death or being permanently handicapped from accidents.

5.4 Conclusion

The achievement of the stated objectives in ensuring automobile mechanics awareness to safety practices in automobile workshops solely depends on the research questions of the study. The respondents agreed that most of the items in research questions one were The types of occupational hazard and risks that automobile workshop mechanics are exposed to.

The respondents agreed that most of the Out listed items in research question two were the level of awareness of the occupational safety and health management practices that are peculiar to their jobs. Expect for two items where they disagreed

The respondents agreed that Most of the out listed items in research question three are the types of injuries, illness and other occupational hazard that the automobile workshop mechanics are prone to. Expect for one item that disagreed.

The respondents agreed that Most of the out listed items in research question four were in compliance with the occupational safety and health management practices and regulations as stipulated by occupational health and safety laws in Nigeria. Expect for one where they disagreed.

The respondents agreed That most of the out listed items in research question five are the ways by which automobile workshop mechanics can carry out their jobs in a safe and healthy manner in devoid of accidents and injuries. Expect for one item where they disagreed.

5.5 Recommendations

Based on the findings of this study and their implications, the following recommendations have been taken into consideration

1. Government should ensure that automobile workshop mechanics apprentice and master craftsmen are aware of the various types of occupational hazard and risks that automobile workshop mechanics are exposed to in Minna Niger state.

2. Government should ensure that automobile workshop mechanics comply with the occupational safety and health management practices and regulations as stipulated by occupational health and safety laws in Nigeria.

3. automobile mechanic master craftsmen should ensure that their apprentices are aware of the occupational safety and health management practices that are peculiar to their job in Minna metropolis Niger state.

4. Government should ensure that automobile workshop mechanics are aware of the various ways in which automobile workshop mechanics can carry out their jobs in a safe and healthy manner in devoid of accidents and injuries in Minna metropolis Niger state.

5.6 Suggestions for further research

1. Assessment and maintenance practice of automobile workshop equipment and facilities in Minna metropolis Niger state.

2. Assessment of accident implication in automobile workshop in Minna metropolis Niger state

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APPENDIX

RESEARCH QUESTIONNAIRE

ON

ASSESSMENT OF OCCUPATIONAL SAFETY AND HEALTH MANAGEMENT PRACTICES IN AUTOMOBILE WORKSHOPS IN MINNA METROPOLIS, NIGER STATE

PART ONE

Please, complete the questionnaire as faithfully and sincerely as possible by ticking the column that best represent your perception about the above topic: the questionnaire is for research purpose and your view will be treated confidently.

Status: master craftsmen ☐ Apprentices ☐

AGE: 26-30 ☐ 30-35 ☐ 35-40 ☐ 40-45 ☐ 45-50 ☐ 50-55 ☐

Guide on how to respond to the questionnaire: use the following rating scale to indicate your opinion by ticking the phase that best describe your level of agreement to the items

Strongly Agree = SA

Agree = A

Disagree = D

Strongly Disagree = SD

APPENDIX A

SECTION A

RESEARCH QUESTION 1

What are the types of occupational hazards and risks that automobile workshop mechanics are exposed to in Minna metropolis, Niger State?

S/N	ITEMS	SA	A	D	SD
1	Noise and vibration hazards				
2	Heat hazards				
3	Chemical hazards				
4	Fire accidents				
5	Electrical shock				
6	Slips and fall				
7	Mechanical hazards				
8	Electrical radiation				
9	Oil spillage				
10	Respiratory hazards				
11	Vehicle accidents				
12	Machinery malfunction				
13	Falling object				
14	Poor housekeeping				
15	Slippery/wet floors.				

APPENDIX B

SECTION B

RESEARCH QUESTION 2

What is the level of awareness of the occupational safety and health management practice that are peculiar to automobile mechanics in Minna metropolis, Niger State?

S/N	ITEMS	SA	A	D	SD
1	Use of wrong capacity fuse may cause injury and damage equipment				
2	Automobile source of environmental contaminants that are very toxic to humans				
3	Lack of concentration while working with automobile by automobile mechanics and apprentices can lead to accident				
4	Personal protective equipment are usually considered a luxury and rarely provided				
5	Inadequate connections will lead to overheating and can result to severe burns and fire.				
6	Bodies which have contact with chemical can cause burn				
7	Automobile hazard can kill				
8	Hazard result due to improper bolting automobile parts.				
9	Spraying of commonly used chemicals such as Polyisocyanates can cause airborne				
10	Safety clothing's are necessary to protect the automobile expert from hazards				
11	Persons working in the vicinity of an automobile workshop, including other workshops can cause discomfort by stray radiation from welding auto parts.				
12	Hazards result due to rusted or damaged bolting of automobile parts				

APPENDIX C

SECTION C

RESEARCH QUESTION 3

What are the types of injuries and illness that affect automobile mechanics in Minna metropolis, Niger State?

S/N	**ITEM STATEMENT**	**SA**	**A**	**D**	**SD**
1	Cuts burns				

2	Trauma disorder				
3	Kidney diseases				
4	Anemia				
5	Neurological disorder				
6	Death				
7	Electric shock				
8	Eyes irritation				
9	Skin injuries				
10	Chemically induced cancer				

APPENDIX D

SECTION D

RESEARCH QUESTION 4

What are the level of compliance of automobile workshop mechanics to occupational safety and health management practice and regulations as stipulated by occupational health and safety laws in Nigeria?

S/N	ITEMS STATEMENT	SA	A	D	SD
1	Dangerous chemical are kept safe				
2	Adequate ventilation				
3	The work environment is free from hazards				
4	Lightening are provided where necessary				
5	The tools are always return to their racks after use				
6	Mechanics always wear proper dress in the workshop				
7	Mechanics carry sharp tools like chisel, scriber, screw driver in their pocket				
8	Automobile mechanics rest on workshop machine				
9	Hand files use by mechanics are without handles				
10	Waste materials are disposed.				

APPENDIX E

SECTION E

RESEARCH QUESTION 5

What are the ways by which automobile workshop mechanics can carry out their jobs in a safe and healthy manner devoid of accidents and injuries in minna metropolis, Niger State?

S/N	ITEMS STATEMENT	SA	A	D	SD
1	Provision of protective equipment e.g hand gloves/paddling to reduce frictional effects of forceful griping				
2	Organizing lectures and seminars on automobile safety of automobile mechanics				

3	Printed media such as newspaper, magazines can carry information on safety and healthy manner to avoid accidents in an automobile workshop				
4	Broadcasting on radio through news and advertisement on safety of automobile mechanics is very important				
5	Posters carrying safety signs can be placed on conscious places.				
6	Orientation can be arranged for automobile mechanics in their work place by environmental and health agencies in Niger state.				
7	Approved protective wears are worn by technicians				
8	Facilities for the training of automobile mechanics in workshops should be made available in Niger state				
9	Automobile safety awareness can reach automobile mechanics through the use of Global system for mobile communication (GSM) bulk SMS (short message service)				
1 0	Vision and mission of automobile mechanics should be enforcing in automobile workshop.				