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COLLEGE OF TECHNOLOGY EDUCATION – KUMASI

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EVALUATION OF THE KNOWLEDGE OF WOOD WORKERS ON INDUSTRIAL SAFETY PRECAUTIONS AND HAZARDS. A CASE STUDY IN THE ACCRA METROPOLIS

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BY

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AUGUST, 2022

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DECLARATION

STUDENT'S DECLARATION

I hereby declare that, this dissertation, is the entirely of my own original research work except for quotations and references from other people's work, which has been identified and acknowledge accordingly, and that no part of it has been presented for another award of degree in the University of Education, Winneba or elsewhere.

CANDIDATE'S SIGNATURE ……..

DATE……

CANDIDATE'S NAME: MR. ANTHONY KWOFIE

SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this action research work was supervised in accordance with action research work laid down by the University of Education, Winneba.

SUPERVISOR'S SIGNATURE……..

DATE……...

SUPERVISOR'S NAME: PROFESSOR NANA FRIMPONG MENSAH

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DEDICATION

This Research work is dedicated to Almighty God for His abundant grace bestowed upon me by successful completion of this research work. It is also my pleasure to dedicate to my cherished and humble wife Mrs. Jemima Kwofie including my Sons, Godslove Nana Nhyire Kwofie and Anthony Kristodea Kwofie Jnr and Daughter Peacelove Maame Takyiwah Kwofie who always encouraged and remembered me in their fervent prayers for God to see me through this academic path.

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ABSTRACT

The purpose of this study was to assess the knowledge of local saw millers on industrial hazards and personal safety concerns in the satellite and unregistered saw mills in the Accra metropolis with the aim of helping to reduce if not eliminate the rampant occurrence of injuries in the wood /furniture industry. The machine operators and carpenters at the Accra Timber market formed the population or sample frame for the study. A sample size of 100 was randomly selected. 40% master craft men and 60% apprentice (trainees/ employees). The data collected was analysed using descriptive statistics. To achieve this, working experience and educational level of the respondents was cross - tabulated with the research questions to arrive at frequencies, percentages and mean differences among the variables. P - Value of 5% ($P< 0.05$) was used to analyse the seven hypotheses formulated. Questionnaires, interviews and observations were used. Two sets of closed ended form, of twenty items each were designed to collect relevant data from the sample. The result indicated that, the wood workers at Accra timber market is male dominated since all respondents reported to be males. It further indicated that the majority of the workers had basic education which reflected on their knowledge level of safety at their work places. It showed very weak attitude towards safety precautions even though majority indicated they observed safety at work. ***65%*** indicated that they did not use safety clothing and devices and 95% of the total respondents also indicated they did not have fire safety equipment at all. The recommendations among others included the following. Factory inspectors should be resourced to intensify supervision and education on safety. Government should develop interest in the safety of wood workers since they are one of the major contributors in the nation's infrastructure development. Employers should be mandated to implement regulations on safety to the benefit of their employees.

CHAPTER ONE

Background to the Study

The capacity of the workforce help to sustain the economic and material requirements of society, thus the occupational health, safety and well-being of working people are crucial and a pre-requisite for productivity. This is very important for socioeconomic and sustainable development (World Health Organization, 1946).

In the absence of a national occupational safety and health policy in Ghana, the Factories, Offices and Shops Act of 1970, Workman's Compensation Act 187(1987) and Labour Act 651 (2003) are the main legislative documents on occupational safety and health in Ghana. Despite these legal framework, related accidents, injuries and disease cost Ghana a lot of money as reported by the Regional Labour Department in the Greater Accra region (2010).

The physical and economic growth and well-being of any country may not be achieved when its timber and forestry division is neglected. The forestry and timber division of Ghana has been of immense importance to the development of the country. This division has helped in its development of infrastructure i.e. the construction of homes, schools, factories/industries, offices, roads and many more. This section also increased Ghana's worth through the exportation of raw and finished materials for foreign exchange (Acquah & white, 1998).

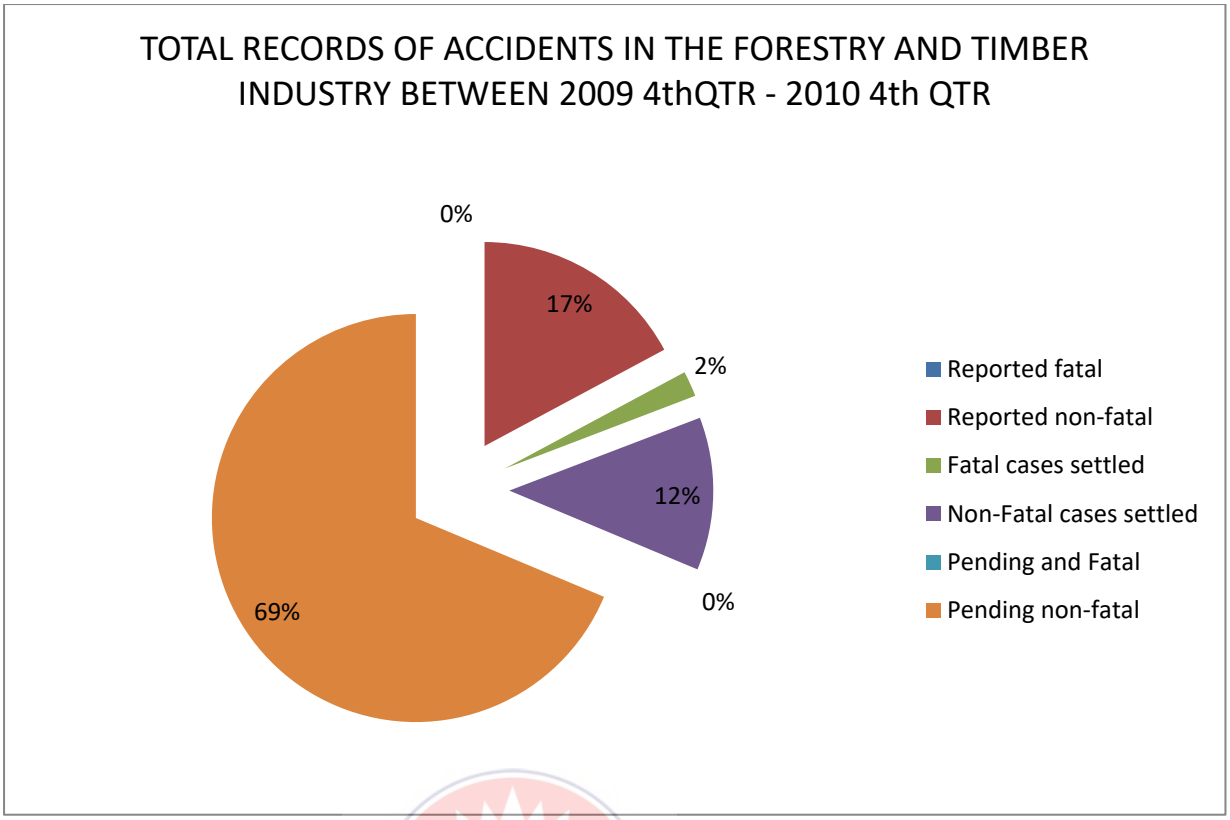
In view of the contributions by the forestry and timber industries, there is the need to ensure good work conditions at the industries in order to achieve the goal of good conditions of work which requires detailed safety plans and its execution in controlling hazards and, accidents in the industries to reduce the rate of the loss of man-hours to help boost high levels of productivity (Acquah & white, 1998).

The nature of work done by small scale woodworkers considering the type of

equipment and materials they handle present many on-the-job hazards and injuries whiles working for increase productivity. These hazards and injures result from such incidences include being caught in or struck by machinery, falling as a result of slippery floors, obstructing work pieces on the floor, heavy lifting of work pieces, repetitive movements, inhalation of chemical fumes and sawdust, fire etc. Beside the hazards inherent in this profession are the unfavorable factory conditions like high temperatures and noise pollution injurious to human health. In order to fully assess the knowledge of small scale woodworkers on industrial hazards and safety concerns in the study area, an overview of the wood processing activities and associated hazards and injuries are necessary (Acquah & white, 1998).

The Labour Act, Act 651(2003) has been one of the legislations that guide safety in the industries. Part XV of the Act deals with occupational health, safety and environment. Section 118 of the Act, subsection 1 and 2(a-h) places a duty on the employer to ensure that every worker employed, works under satisfactory, safe and healthy conditions by providing the necessary logistics that are healthy and safe to the workers at the work floor.

Notwithstanding the efforts made by government towards the safety of workers, records show that workers are injured daily, which cost government a lot of money by way of payment of compensation and the reduction in man-hours hence low productivity, consequently low foreign exchange earnings. The records below give an insight to the claim (Segun and Yahaya, 2010)



Records from the **FILE NO. LAR-44(12) V.3. (2011)** indicates that between the periods of October 2007 to October 2009, approximately two years, 7 fatal accidents occurred and compensation paid. Non- fatal accidents cases (amputation, minor cuts and others) settled, recorded a total of 113. Pending cases recorded 1 fatal and 565 non-fatal. Within the same period, reported cases included 2 fatal accidents and 143 non-fatal accidents which has not yet been regularized for payment. In all, it would have cost the government an amount of one hundred and fifty one thousand eight hundred and fifty seven Ghana cedis, twenty two Ghana pesewas (GHC l51, 857.22p) as payment of compensation to workers for only the Accra District.

In view of the above, there is the need to explore the type of injuries and their causes that predisposes the worker to such injuries and whether it has any relationship to the

worker's knowledge on industrial hazards and personal safety in the performance of their work. This study is centred on assessing the knowledge of small scale woodworkers who are not formally registered among the wood industries in Ghana, on industrial hazards and personal safety concerns, especially, in the Accra metropolis. The small scale woodworkers being part of the informal sector are not usually subjected to inspection, therefore reports of accident cases which is necessary in ensuring safety at the workplace is normally absent. As a result, vital accident information is lacking. Segun and Yahaya (2010) in their study observed this phenomenon.

1.2 Statement of the Problem

Keeping the workplace safe must not be the concern of only workers and companies but also national and global economies whose productivity and competitiveness play a major role on safe working environment. To improve health and safety measures at the workplace with the aim of ensuring continuous labour productivity, every business entity needs to put in place pragmatic health and safety practices that will address industrial accidents resulting in injury and death of workers (Ganson, 2014). Accidents are costly to an organization due to a variety of outcomes including; demotivation of workers, disruptions of activities, delayed progress of work, additional adverse effects of the organizations overall cost structure, productivity and reputation (Mohammed, 1999).

The International Labour Organisation considers issues relating to occupational health and safety to be of much importance to the extent that it has devoted about 80% of its standards and instruments either wholly or partly to it (Alli, 2008). This notwithstanding, currently around 160 million people are estimated to suffer from occupational diseases.

Additionally, two million people die every year as a result of occupational accidents and work-related diseases and injuries (ILO, 2013). These numbers may translate into an estimate of nearly 5 percent loss of the world's GDP (Alli, 2008). Furthermore, according to the World Health Organization as cited in (Amponsah-Tawiah & Dartey-Baah, 2011), poor occupational health and safety reduced working capacity of. Additionally, there were 2.33 million work-related mortalities in 2014, and in 2015 work-related deaths accounted for five percent of the global total mortality (Work Safety and Health Institute, 2016).

Work-related mortality is, however, on the increase given that it is estimated to reach 2.78 million in 2017 (Work and Safety Institute, 2017). The biggest share of work-related mortality comes from work-related diseases which accounted for 2.4 million (86.3%) of the total estimated deaths. Fatal accidents accounts for the remaining 13.7% of work-related mortality.

There are many studies on occupational safety. Ametepeh et al. (2013) found that a sample of informal workers in Sekondi Takoradi, comprising of mechanics, porters, drivers, and beauticians were exposed to a myriad of physical, ergonomic, and psycho-social occupational hazards. Akazili et al. (2018) also found that informal workers, consisting of porters and hairdressers in the Kassena-Nankana East and West Districts had no health insurance. The Women in Informal Employment Globalizing and Organizing (WIEGO, 2013) concluded in their study that, informal traders in Accra face occupational hazards, predominantly fire, poor sanitation, food poising, theft, harassment, and work-related stress.

In terms of health and safety awareness among informal artisans, Okwabi et al. (2016) indicated that master craftsmen and their apprentices in informal garages in the Accra metropolis had similar level of knowledge of health and safety practices. Generally,

their level of awareness was low, but the master craftsmen reported receiving safety awareness training. At Cape Coast, Nana-Otoo (2016), found that informal food processors, textile manufacturers, wood processors, and metal workers did not have the necessary awareness and technical means to implement health and safety measures.

A study conducted by Adei and Kunfaa, (2007) indicated that wood processers in Ghana are exposed to physical, ergonomic, mechanical and chemical hazards. The perceived physical hazards in their study were sawdust, noise and extreme high temperature with sawdust inhalation being the major hazard.

Many earlier studies have noted that the issue of health and safety hazards of wood workers are due to inadequate occupational safety and health policy and procedures, low priority given to occupational safety and health issues by Timber and Woodworkers Unions in Ghana, non-commitment by management to implement occupational safety and health policy where it existed and their consideration of payment of insurance premium as sufficient protection for workers (Acquah-Moses, 2002). This current study seeks to assess occupational health and safety of wood (Evaluation of the knowledge of Wood workers on Industrial Safety Precautions and Hazards). The study further laid emphasis on the awareness level of wood workers on personal safety practices in the Accra Metropolis and to investigate the observance of existing safety practices by wood workers. Additionally, this study will assess (the factors influencing the observance of the safe practices among the woodworkers and to also recommend measures to improve the enforcement of safety regulations amongst the wood workers).

1.3 Research Aim:

To evaluate the knowledge of small scale woodworkers on industrial safety and the Hazards associated with their work in the Accra metropolis.

1.3.1 Specific Objectives

i. To assess the awareness level of wood workers in the Accra Metropolis on safety practices.

ii. To investigate the observance of existing safety practices by wood workers

iii. To identify the factors influencing the observance of the safe practices

iv. To recommend measures to improve the enforcement of safety regulations amongst the wood workers.

1.3.2 Research Questions

1. Are there any similarities in the socio economic characteristics of small scale wood workers?
2. What is the level of wood workers knowledge on safety regulations?
3. Do small scale wood workers observe safety rules and regulations whiles at work?
4. What are the measures to enhance safety standards at work?

1.4 Significance of the study.

Although several studies have been carried out in the area of occupational health and safety, there is still a gap which this study would fill especially providing local content to the problem. That is to say, most of the studies conducted on occupational health and safety are foreign based and as such available literature lack local context. The study therefore, is significant so far as it gathers and analyses information in Ghana based industries.

The findings of the study will make available innovative information and new ways of handling occupational safety issues at sawmills in Ghana. This will help to reduce the

cost of paying for accident compensation by the sawmill operators in Ghana. Additionally, this study would be useful to policy makers with regard to work place health and safety issues. Policy makers can make use of the findings in policy formulation and implementation on health and safety practices for improved work situations. Furthermore, the findings which were based on well-crafted questionnaire and interviews would furnish organizations that are in work place health and safety advocacy such as trade unions with wealth of information to be used in designing programs to educate and sensitize workers on the issues as well as utilized the information to advance the course of workers welfare.

1.5 Limitation of the Study

This study is limited to woodworkers in the Accra metropolis, Accra Timber market as the study area since financial constraint and time is limiting this research to be extended to the registered sawmills in Accra metropolis and the whole of Ghana.

Again the research limits itself to the knowledge of woodworkers on industries hazards and injuries due to the above reasons than to have researched into other areas like cause of accidents, and the criteria of employment of sawmill workers etc.

A study in this direction at Accra timber market will not be smooth. There might be pockets of problems along the line. The likelihood of apprentices giving false answers in order not to expose their masters is imminent, and that might affect the validity and reliability of the results. There is also the tendency of master craftsmen to be hesitant in answering questions truthfully as they do not know much about the researcher.

Also, it was difficult to obtain up to date and accurate information on workers due to the fact that there was no access to documention or informations of the workers.

Finally, the researcher is the sole financier therefore; shortage of funds could limit him in some of the activities to be carried out.

1.5.1 Definition of Terms

GDP - Gross Domestic Product

AMA – Accra Metropolitan Assembly

WHO - World Health Organization

LLL - Logs and Lumber Limited

KMA - Kumasi Metropolitan Assembly

WITC - Wood Industry and Training Centre

OSHA - Occupational Safety and Health Administration

ILO - International Labour Organization

GPRTU - Ghana Private Road Transport Union

1.6 Organization of the Study

This study has been presented in six chapters. Chapter one which is the introduction covers Background to the Study, Statement of the Problem, Research Objectives, Purpose of the Study, Research Questions, Significance, Limitations and Definition of Terms. Chapter two, deals with Review of Related Literature for the Study. Chapter three takes care of the Methodology used for the study. This includes Research Design, Population, Sampling, Research Installment, Data Collection, Data Preparation and Analysis. The fourth chapter looks at Results and Findings of the study. Chapter five also highlights on Discussions emanating out of the study. Last but not least, chapter six covers Summary of Findings, Conclusions and Recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The wood industry has historically been considered to be one of the most dangerous work place to its employees. Workers are often exposed to hazards ranging from falling trees, debarkers, saws, and rail guns while often working under pressure for high productivity. Compounding the danger from these hazards are the mental and physical challenging working conditions that can include extremes temperatures and high noise levels.

Managers at many wood based companies sincerely care about working conditions and the health and safety of their work force. They truly believe that safety should be given a higher priority than production or sales volume. Over the past two decades, an increasing number of producers, both large and small industries, have shown their support of safety by elevating it to a core value as part of the corporate mission statement (Judd and Janice, 2004).

The nature of the work done by workers in these occupations and the type of equipment and materials they handle present many on-the-job hazards. These hazards and injuries resulting from such incidence include being caught-in or struck by machinery, falling from a height, heavy lifting or repetitive movements, twisting or reaching, and breathing in noxious or toxic chemicals while working for increase productivity. Besides the hazards inherent in this profession are the unfavourable weather conditions and noise pollution that is injurious to human health (Judd and Janice, 2004). In order to fully assess the safety environment in the mill sites within these areas, an overview of the wood processing industry's activities and associated hazards are necessary.

2.1.1 Available Policy on Safety

Act 651 entitled the "Labour Act (2003) was assented to provide for the health, welfare and safety of persons employed in factories, offices and shops, other places and matters connected there with, in which the small scale woodworkers and its workers scattered in and around the Accra metropolis are part especially the study area, Sokoban Wood Village. The Labour Act makes the following provisions in relation to health, welfare, safety and environment of persons in factories, offices and shops.

2.1.2 General Health and Safety Conditions

1. The onus is on the employer to ensure that workers under him/her work under satisfactory, safe and healthy conditions.
2. According to the Labour Act, Act 651 (2003), an employer shall:
   i. Provide and maintain plants and systems of work that are safe and without risk to health.
   ii. Ensure the safety and absence of risk to health in use, handling, storage and transport of articles and substances.
   iii. Provide the necessary information, instructions, training and supervision taking note of the age, literacy level and other circumstances of the worker to ensure the health and safety at work of those other worker engaged on the particular work.
   iv. Take steps to prevent contamination of the workplace and protect the workers from toxic gases, noxious substances, vapours, dust, fumes, mists and anything likely to cause risk to safety or health.
   v. Supply and maintain at no cost to the worker, adequate safety appliances,

suitable fire- fighting equipment, and personal protective equipment and instruct the worker to use them.

vi. Provide separate, sufficient and suitable toilet and washing facilities and adequate facilities for the storage, changing drying and cleaning from contamination of clothing for male and female workers.

vii. Provide adequate supply of clean drinking water at the workplace.

viii. Prevent accidents and injury to health arising out of work environment by minimizing the causes of hazards inherent in the working environment.

3. The duty of the worker to use safety appliances and to observe all safety regulations in compliance with the employer's instructions.

4. The employer shall not be liable for any injury suffered by a worker where the injury is caused solely by non-compliance by the worker.

5. An employer who fails to provide adequate protection and instructions on safety regulations shall be liable for the workers injury (Labour Act 2003, Section 118-121).

2.1.3 Exposure to Imminent Hazards

1. When a worker finds him or herself in any situation and has reasonable cause to believe it presents an imminent danger to his or her life, safety or health, the worker shall report to his or her supervisor and remove him or herself from the situation.

2. The employer shall not discuss or withhold any remuneration of a worker who has removed himself or herself from situations of imminent danger to his or her life, safety or health.

3. The employer shall not require a worker to return to work in circumstance with imminent danger to the life, safety or health of the worker. (Labour Act 2003, Section 118-121).

2.1.4 The Duty of the Employer to Report Occupational Accidents and Diseases

The employer is required to report as soon as possible and not later than seven days from the date of occurrence to the appropriate government agency, occupational accidents and diseases which occur in the workplace (Labour Act 2003, Sectionll8-121).

2.1.5 Specific Measures

The minister may by legislative instrument make regulations providing for specific measures to be taken by employers to safeguard the health and safety of workers employed by them (Labour Act 2003, Section 118-121).

2.1.6 Perspective of safety and health under the factories, Offices and shops act 1970.

Act 328 entitled the Factories, Offices, and Shops Act 1970, was enacted to provide for the registration of factories, the health, welfare and safety of persons employed in factories, offices, shops and other places, and matters connected there with, in which the small scale woodworkers scattered in and around the Accra metropolis and its workers form part.

The Act makes the following provisions in relation to health, welfare and safety of persons in factories, offices and shops ACT 328 as amended, 1983(PNDCL 66) section 1-9.

2.1.7 Health and Welfare

The factories, offices and shops ACT 328 (1970) as amended, 1983(PNDCL 66) requires the employer to report:

i. All accidents resulting to death or disablement should be reported to the chief

inspector of the factories, offices and shops inspectorate of the district.

ii. All dangerous occurrences like explosion, fire and collapse of buildings should be reported to the chief inspector of the area.

iii. The inspector of the district must be notified of all industrial diseases.

iv. All factories, offices and shops should be kept clean from dirt and refuse, including the painting of walls and partitions.

v. No room, constituting a factory, office or shop should, while work is carried on there in, be so overcrowded as to cause risk or injury to the health of persons working therein.

vi. Effective and suitable provision should be made in all factories, offices and shops to secure and maintain the circulation of fresh air in each workroom, adequate ventilation of the room.

vii. Adequate and suitable washing facilities, conveniently accessible for the use of all persons employed, should be provided and maintained in a clean and orderly condition in every factory, office and shop.

viii. An adequate supply of wholesome drinking water should be provided and maintained at suitable points conveniently accessible to all persons in the factory, office or shop.

ix. No food or drink should be taken in any room of a shop where poisonous or injurious substance is used.

x. Suitable protective clothing and appliances, including gloves, footwear, goggles and head coverings should be provided to workers whose works involve excessive exposure to wet or to any injurious or offensive substance.

xi. Noise and vibrations likely to affect the health of persons in any factory, office or shop should be reduced as far as possible by appropriate and practicable

measures.

xii. No person should in the course of his work be required to lift, carry or move any load so heavy as to be likely to cause injury to him.

xiii. A first aid box of the prescribed standard should be provided and maintained in every factory, office and shop so as to be readily accessible,[Factories Offices and Shops ACT 328 (1970) as amended, 1983(PNDCL 66) sections 10-29.

2.1.8 Safety

The factories, offices and shops ACT 328 (1970) as amended, 1983(PNDCL 66) Requires all employers to provide the following:

i. In every factory, office and shop, there should be provided and maintained appropriately means for fighting fire, which should be so placed as to be readily available for use.

ii. Every factory, office and shop should be provided with such adequate means of escape in case of fire for the persons employed there in.

iii. There should, so far as is reasonably practicable, be provided and maintained safe means of access to every place at which any person has at any time to work, and every such place should, so far as is reasonably practicable, be made and kept safe for any person working there.

iv. Every dangerous part of any machinery should be securely fenced unless it is in such a position as to be as safe to every person working in the premises.

No person should be engaged on any machine or in any process liable to cause bodily injury, unless he has received a sufficient training in work at the machine or in the process, or is under adequate supervision, [Factories Offices and Shops ACT 328 (1970) as amended. 1983(PNDCL 66) sections 30-35.

2.1.9 History of Occupational Safety and Health

Throughout recorded history, there have been references to work under a variety of conditions. The Old Testament includes rules about safe practices with regards to agriculture and how to treat workers. The Greeks and Romans used slaves, generally those captured in battle, to do both domestic work and to work in especially hazardous conditions such as mining. The writings of the ancient settlers discuss some early preventive measures, such as using inflated pig bladders to breathe into to avoid dusty atmospheres according to Kovarik (2008).

According to Kovarik (2008), many of the specific problems of industrial safety and health have only been recognized in the past 150 years and the duty to protect workers has long been acknowledged. Beginning in earnest in the 18th century, the industrial Revolution of Europe led to large numbers of individuals settling in cities and work in factories. As more and more people worked in factories, and the hazards of factory work became known, regulations came into place regarding who could work, and under what condition.

The first written discussions specifically directed toward matters of occupational safety and health were those of Paracelsus, in the 15th century. In the early 18th century, Bernadino Ramazzini who is regarded the “Father’ of occupational medicine, wrote the book “De Morbis Artificium Diatriba”, which examined the diseases and problems of 52 occupations. In 1831, Charles Turnar Thackrah, a British physician,

published "The Effects of the Principle Arts, Trades and Professions "Around the same time Parliamentary commissions began investigating outrageous working conditions common in England. In 1842, a New York physician John H. Griscom wrote "The sanitary condition of the labouring population of new York City (Kovaric, 2003). Some of the major occupational diseases common among these authors were" occupational lung cancer, bussinosis, black lung disease and silicosis. The 20th century saw most Nations coming out with regulations and awareness of occupational health and safety. In the view of Foulke, (2007), there are lives of millions of men and women on both sides of the Atlantic who seek each day to work without fear of injury or illness, so they may return to their families and friends at the end of each work day safe and healthy. Presently the international labour organization and other organizations are ensuring the safety of workers with regulations and treaties. On the fifth EU-US Joint Conference on health and safety at work (2007) indicated practical solutions to workplace challenges.

2.1.10 Occupational Health and Safety Defined

Health is a positive concept that includes social and personal resources as well as physical capabilities (Nutbeam, 1990). It has been conceptualised as the ability to have and to reach goals, meet personal needs and cope with everyday life (Raphael, Brown, 1997, Renwick & Rootman, 1997). The world health organisation, defines health as not just the absence of disease but as a state of complete physical, mental and social well-being (WHO. 1986). A joint definition of occupational health endorsed by the ILO and WHO (as revised in 1995) states that: *"Occupational health should aim at:*

the promotion and maintenance of the highest degree of physical, mental and social

well-being of workers in all occupations; the prevention amongst workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the workers in an occupational environment adapted to their physiological and psychological capabilities; and, to summarize : the adaptation of work to man and of each mem to his job " (WHO, 1995)

2.1.11 Sources of Accidents/Injuries in the Wood /Furniture Industries.

Hazards/risks in the sawmill industry include environmental hazards as a result of poor forestry practices and management, poor solid waste management and toxic emissions to air, noise, hazards due to machinery use, and ergonomic hazards resulting from lifting of heavy loads, reaching for objects, repetitive work, and poor work posture (Aruofor, 2009).

Human factors, which acts upon the working capacity and the daily production efficiency, include the individual characteristics such as sex, age, body-size, physical fitness, nutritional and state of health (Aiyelari *et al.* 1998; Jekayinfa, 2007). It has also been observed that psychological, cultural, economic, technological and organizational factors also act upon man's working capacity and production.

Workers are also prone to injury when removing scrap or finished pieces from the table. Kick back injuries as a result of incorrect blade height etc. As a result of the high level of human (manual handling) involvements in sawmilling operations,

According to Segun and Yahaya (2010), body areas mostly subjected to mill site injuries are the back; low back, head, limbs, fingers and toes. The injury to these body area ranges from bruises and sprains to the back and ankles, cuts inflicted by flying wood chips and stone, loss of a finger or some fingers to saw blade and machine parts, arm and leg injuries. Injuries to the back and low back are all the time as a

result of bending awkwardly to lift heavy logs, reaching for far objects and working on low log tables leading to loss postures, developing bow-back and lower back disorders which such injury evidently takes a long time to manifest thus interactions with workers with such feasible deformities regarded it not as an injury but a natural phenomenon according to Segun and Yahaya (2010),

They also found, that wrist and hand injuries were also prevalent including finger cuts encounter with saw blades; mostly the forefingers, bruises and stiff wrist as a result of over exertion and repetitive motion disorders, arm injuries including strains developed from lifting heavy lumbers onto the mill table and removal of sawn wood. Many of these incidents had similar circumstances and commonly associated factors. Regardless of the working category, gender differences or location of the mill in which they occur, these circumstances and contributing factors are with emphasis on the type of fatal events, rather than the working category of the affected persons (Hetu, 2009).

They concluded, that the percentage of body stressing injury due to lifting of lumber, lifting or lowering of sawn lumbers, boards and other heavy machine parts in awkward position is high and accounts for lower back pains often experienced by the workers and a long term effect of work-related-disorders according to Hetu (2009). Being hit by moving or falling objects, being trapped by moving-or being trapped between stationary machinery is more critical during maintenance and milling operations.

2.1.12 Noise Exposure and its Effects to Woodworkers

According to Hetu (2000), workplace-noise exposure is one of the most prevalent workplace exposures with a large number of workers being exposed to levels above

the 8 hours exposure limit of 85 dB (A) . Davies *et al.* (2009), found that workers were exposed to average noise levels of 92 dB (A), and in Alberta sawmills, workers were found to be exposed to noise at 95 dB (A) orhigher, (Koehncke *el al.* 2008).

Noise-induced hearing loss is the most common health outcome associated with exposure to noise. However, there is evidence to suggest that there are also 'non-auditory' health problems caused by exposure to noise, including psychiatric symptoms (Melamed *el al.* 2008), myocardial infarction and other cardiovascular effects and injuries (Willich *et al.* 2006;Tomei *et al.* 2009).

According to Moll and Mulder (2004), Occupational noise apparently increases the risk of both fatal and non-fatal workplace injuries. Melamed *et al.* (2008) and Smith, (2010) found that noise levels greater than 80 dB (A) contributed significantly to occupational injuries in both men and women. Choi *et al.* (2005), found that wearing hearing protective occasionally significantly increased the risk for accidents. In a study by Girard *et al.* (2009), they found that working in noisy environments significantly increased the risk for workplace accidents.

Wilkins and Action (2011), discussed the possible mechanisms that link noise and injuries. Loud noise itself or the use of hearing protective may impede concentration or interfere with possible warning signals. Noise-induced hearing loss can hamper the perception of sounds, reducing the ability to distinguish between certain sounds and increasing the chance of misunderstanding alerts and messages. According to Hetu (2009), working in noise levels of 85 db (A) and above, aural warning signals were often found to be too weak, normal conversation, and messages shouted from a distance in environments at this noise level, cannot be understood. Smoorenburg *et al.* (2007), furthermore, stated that noise can trigger a stress response in workers, or fatigue the worker, making them less sensitive to warning signals.

2.1.14 Eye Injuries among the Woodworkers in the Wood Industry

Sawmills are hazardous work environments because the work process involves the movement and cutting of large and very heavy pieces of wood at relatively high speeds. Wood preservatives could result in chemical injury on accidental entry to the eye (Demers &Teschke, 2006). According to Demers and Teschke (2006); Abiose and Otache (2000), at every stage of wood processing, the eye is at potential risk of injury. Ocular hazards in industries are preventable if there is strict adherence to safety rules and precaution. Factors which contribute to the risk of ocular trauma and other injury include poor housekeeping in the work environment which increases the risk of slips and falls, the wood dust may pose a fire or explosion hazard, and the high noise level which can cause injuries due to the reduced ability of workers to communicate and hear audible warning signals (Demers & Teschke, 2006). Demers and Teschke (2006), also suggest that some common causes of fatal or very serious injuries include workers being struck by mobile equipment, falls from elevated platforms, injury resulting from failure to switch off equipment during maintenance or attempts to remove jams, injury from saws and other machineries and drowning of workers in log ponds or water ways. Ocular trauma, blindness and even death could occur in advertently if safety precautions are not adhered to (Demers & Teschke, 2006).

Garrow (1999), indicate that eye injuries sustained at work have always been a source of concern to ophthalmologists since the first important survey of eye injuries demonstrated that all severe eye injuries admitted to hospitals occurred at the workplace, with more than 12% of these eyes being enucleated. In 1996, the National Institute for Occupational Safety and Health in the United States of America (USA) estimated a total of 900,000 occupational eye injuries.

Congdon *et al.* (2003), Ajaiyeoba (2005), Ajayi and Osuntokun (2001), suggest in their study, that the type of occupation and work environment is a strong determinant in the nature of ocular injury and disorders which individuals are prone to. Eye injuries if not promptly and properly managed could result in blindness.

It is estimated that 2.4 million ocular injuries occur in the USA every year (Feist and Farber, 1989). The pattern and causation of eye injuries vary in different environments depending on the level of industrialisation, awareness, economic development, safety measures and precautions (Ajaiyeoba, 2005). The risks of ocular trauma have been reported to have increased among small scale industrial workers in developing countries because of poor working conditions, longer hours at work and poor safety precautions (Gordon, Darwin & Wale, 2002).

2.1.15 The Danger of Exposure to Wood Dust by Wood Workers in the Industry.

Wood workers are exposed to a large variety of dangers in the wood industry wood dust and other biohazards related to wood dust like fungi, bacteria and endotoxins (Alwis *et al.* 2006; Dutkiewicz *et al.* 1998), chemicals like formaldehyde (Partanen, *et al.* 2001). and phenol (Sterling *et al.* (1998); Kauppinen, *et al.* 1999), and physical injuries due to nature of their job is a burden on the health cost of workers (Bull *et al.*2007). Sanding, manual work, use of compressed air, use of full-automatic machines, cleaning of work pieces with compressed air, kitchen producing factories and small scale industries increases the wood dust concentration (Schlunssen *et al.* 2008). They further reiterate that sanding with adequate exhaust ventilation, manual assembling/packing, vacuum cleaning of machines and special cleaning staff decreases the wood dust concentration in the wood industry.

Due to the above mentioned exposures, wood workers experience a variety of symptoms ranging from blocked nose while at work, coughing, redness of eyes, itchy

nose, phlegm, symptom of asthma and chronic bronchitis and ear problems (Osman and Pala, 2009; Schlunssen *et al.*2002).

Woodworkers are at risk of developing various respiratory diseases with involvement of upper airways by rhinitis (Bevilacqua, *et al.* 2007; Ahman, and Holmstrom, 2000; Underner *et al.* 1988) with a higher prevalence (Bevilacqua, *et al.* 2007), chronic bronchitis (Jacobsenttf *al.* 2009) and asthma due to wood moulds (Underner *et al.* 2006), and pneumoconiosis due to a type of wood dust called paulownia (Olcita *et al* 2003). Some studies have shown that as period of woodwork increased, the prevalence of rhinitis and asthma also increased (Bevilacqua *et al.* 2007; Aguwa et <://. 2007). .

Increased incidence of nasal cancers among woodworkers date back to 19561965, when its annual incidence was 500-1000 times more in people working in wood industry compared to the general population in England (Imbus and Dyson, 1996).

International agency for research on cancer (IARC) classified wood dust as carcinogen in 1998 based on its strong evidence to cause sinonasal cancers (Stellman *et al.* 1998), relative risk ranging from 3 - 11 in woodworkers (Comba, and Belli, 2010). They are at increased risk of developing adenocarcinoma of nasal cavity (Bevilacqua. *et al.* 2007; Kacha *et al.*2009; Mohtashamipur *et al.* 1999), and it increases with longer occupational history of exposure to softwood dust in combination with hardwood dust (Hemelt *et al.*2004; Finkelstein, 2008). Strongest association of both is observed in occupations where workers are exposed to hard wood dust without use of chemical additives (Aguwa *et al.* 2007). Average induction period for development of nasal adenocarcinoma after wood dust exposure is reported to be 40 years (range 7-70 years) (Mohtashamipur *et al.* 1989; Finkelstein, 1998; Malker *et al.* 1990).

Wood dust or chemical compounds like phenol (Kauppinen, *et al.* 2000), formaldehyde (Partanen, *et al.* 2006) in woodindustry can lead to a variety of respiratory tract cancers including laryngeal carcinoma (Pollan, &Lopez-Abente, 1999), lung cancer (Kauppinen, *et al.* 1999; Ronco *et al.* 2002) and mesothelioma (Meyer *et al.* 2001).

Other neoplastic and malignant diseases reported in woodworkers are digestive and urinary tract as well as hemopoietic and lymphatic system including Hodgkin's disease (Mohtashamipur *et al.* 1998) malignant lymphoma including non-Hodgkin lymphoma (Persson, 1996); stomach cancer (Stellman and Garfinkel, 1998); bladder cancer, skin cancers and leukemia (Stellman and Garfinkel, 1984); prostate cancer and fatal brain cancer (Stellman *et al.* 1998).

2.1.16 Electrical Injuries as a Cause of Low Productivity among Wood Workers.

Electrical energy has gained wide acceptance since the middle of 20th century. Rapid progress of industrialization and wide spread utilization of electrical appliances leads to many electrical accidents and deaths.

According to Koumbourlis (2002), electrical injury is the passage of electrical current through the body. Although it is relatively uncommon, it still carries high risk of morbidity and mortality. Electrical injuries have been classified generally as low voltage and high voltage (Spies and Trohman, 2006; Yowler, 2001). It is known that low-voltage electrical injury in humans normally does not result in significant tissue damage; however, low-voltage electrical injuries have been reported to sometimes cause significant morbidity and mortality.

In high voltage electrical injury, tissue damage is usually more severe (ten Dius, 1997; Martinez and Nguyen, 2000). Additionally, high voltage results in greater

current flow, which may be high enough to cause massive destruction of the tissues (Spies and Trohman, 2006). It has been reported that electrical injury causes skeletal muscle damage (myopathy).

An evaluation with respect to the occupation of the patients affected by electrical injuries showed that almost half suffered the accident at their workplace (Tarik *et al.* 2010). This same findings was also reported by (Koumbourlis, 2002; Arnoldo *et al*, 2004) in their study. The burns resulting from electrical accidents can be regarded as a public problem that causes a significant loss in the labour force among the young population (Koumbourlis, 2002; Arnoldo *et al*, 2004).

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter seeks to show the exact, precise and specific processes used in the gathering data in order to answer the research questions on the Evaluation of the knowledge of wood workers on industrial personal safety precautions and hazards. More specifically, this section comprises the background characteristics of the study area, research design, and population, sampling procedure, data collection procedure, data preparation and analysis, and ethic consideration in the research work

3.1 The Study Area

The study was conducted at Accra timber market in the Accra metropolis of the Greater Accra Region of Ghana. The choice of the Accra Timber Market was due to the fact that most of the small scale woodworkers are located there. They have a total population of 500 workers (master craftsmen and apprentices) out of a total population of 3000 occupant workers in the Accra Timber market.

3.2 Background Characteristics of Accra Timber Market.

Macola is located in the Accra metropolis. It is about 4kilometres south of the Accra Metropolitan Assembly

Plate 2.1Entrance to Accra Timber Market

Figure 2.3 The Thicknesser Machine being feed by timber board at the shop.

Plate 2.2 Front View of Accra Timber Market

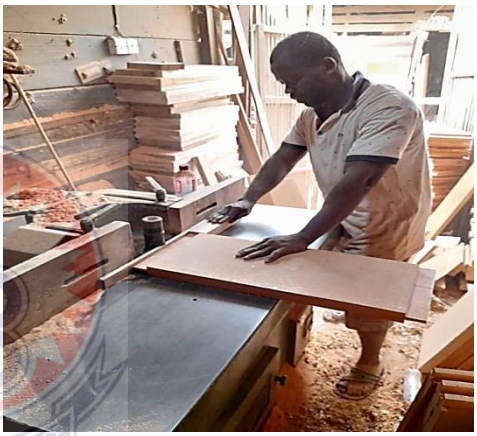


Figure 2.3 An operator using the Spindle moulder without protective devices.

3.2 Research Design

The research method for the collection of data for the study as part of the whole research design included on-the-spot assessment of physical appraisal of safety environment Robson (1993), structured questionnaire (Busha & Harter, 1980) as reported by segun and Yahaya (2010) in their assessment of injuries in small scale saw mill industry of south western Nigeria. Personal observations (Soto*et al.*2001; Cook, 1997) unstructured interviews Blay *et al.* (2007) Hay (2004). These methods of data collection were used in similar reported work of Aiyelari *et al. (*1997), Aiyelari *et al.* (1998), Cole & Ogungbe (1992) and Lehman (1996).

3.3 Population

The population of the study was made up of all artisans of the two main groups of wood workers, that is, medium size wood workers working with machines and carpenters working with hand tools at the Accra timber market in the Greater Accra Region of Ghana. The two elements of the population were the master craftsmen (owners of workshops) and the apprentices (trainee on the job). The estimated population of the master craftsmen was 150 and the apprentices was 200. Therefore, the estimated population of master craftsmen and apprentices summed up to 350 (N=350). Both males and females were considered as the target population.

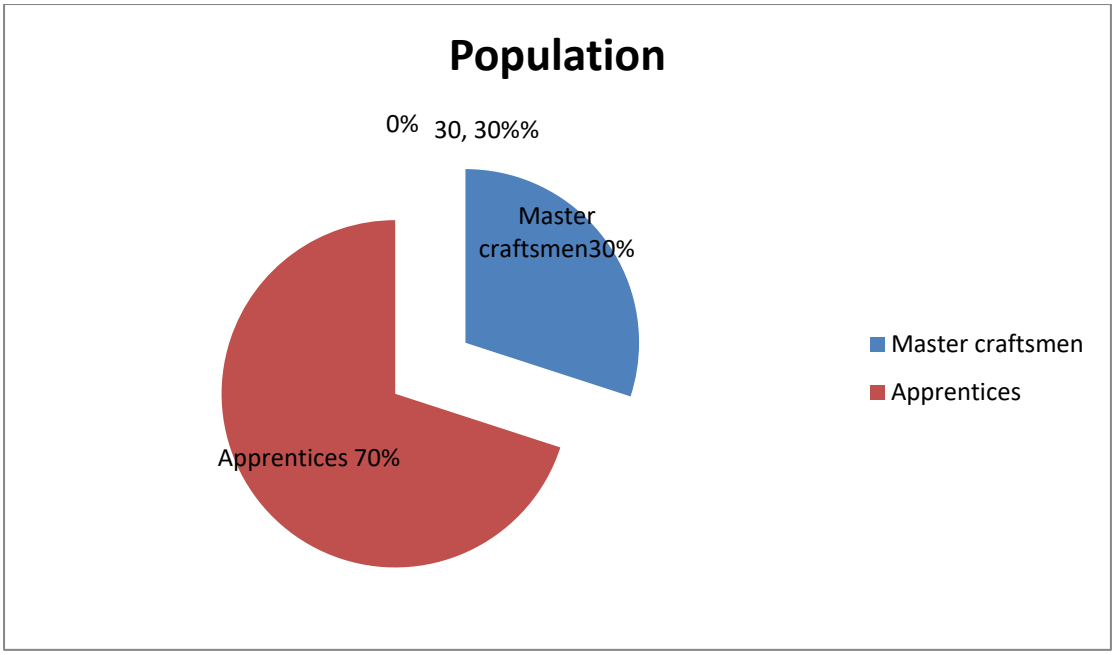


Figure 1: Population Distribution

3.4 Sample and Sampling Procedure

Sampling of the woodworkers was done within the Accra Timber Market in the Greater Accra Metropolis using randomized sampling technique. A sample size of 50% (N=100) from a population of N=100 was randomly selected and considered representative for the purpose of this study. Stratified sampling which is probability sampling was used to ensure an appreciable statistical significance of the study. The stratum was based on the estimated population of the Artisan groupings within the village.

The two Artisan groupings represented strata of two and sampled workers were drawn from each stratum using 30% to represent master craftsmen and 70% to represent the apprentices. That is, 30 of the master craftsmen and 70 of the apprentices were used for the study.

3.4.1 Research Instrument

To help gather adequate information, questionnaires and observations were used in the data gathering. Two sets of closed ended type of questionnaire made of 20 items each were designed to elicit information from the respondents.

The questionnaires were based on how the respondents felt about the issues presented to them and for them to respond accordingly form the suggested responses. The close-ended questions were to ensure efficiency and specificity in response.

3.5 Data Collection Procedure

One hundred copies of questionnaire were used to gather the data. The purpose and significance of the study was made known to the respondents before they made their choice of responses as to what they know about the subject.

To ensure high recovery rate, the questionnaires were personally delivered to the respondents for their opinions. This was done on a face-to-face basis. The respondents were made to have a fair idea of the questions and statements in the questionnaire before indicating their opinions which were expressed in the form of a tick. It is instructive to state that questions that needed clarity by the respondents were explained to them.

Pencils and erasers were provided to the respondents to help them answer the questions by ticking their opinions. One hundred questionnaires were distributed and collected.

3.6 Data Preparation and Analysis

The data gathered were converted from raw form to reduced and classified forms to make them appropriate for analysis. In the preparation of the data, accuracy was ensured and data entry errors were revealed and corrected. Activities that were followed in preparing the data included editing, coding and data entry.

Editing of the raw data was done to detect errors and omissions for correction. This ensured that data became accurate and consistent with respect to the information demanded from respondents. Coding was used to ensure categorization of data. This was done because the statistical software used for the data analysis worked more efficiently in the numeric mode. Coding rules which include exhaustiveness and mutual exclusivity were followed.

The data collected was analyzed using descriptive statistics Gomez & Gomez (1989). Statistical Package for Social Sciences (SPSS) for windows (version 16.0) was the analytical tool used to analyze the data. Cross-tabulation and chi-square were also used to establish relationships and associations. The results and findings of the study were presented using tables for discussion. A p-value of 0.05($p>0.05$) was considered significant to the study.

3.7 Ethic Consideration in Research Work

Ethical issues which were ensured in this study included issues of informed consent, invasion of privacy, anonymity of respondents, voluntarism and plagiarism. The researcher sought the permission of all participants in the research before the conduct of the study (informed consent). Introductory letter was sent to the management and their approval received before the research commenced. The researcher made prior visits to management of the company in order to pre-arrange data gathering periods. This was to prevent unnecessary interruption in their work schedules thereby invading their privacy. Neither names nor any identifiable information from respondents was taken as a way of ensuring the ethical principle of anonymity in social research. This was to prevent possible victimization of respondents in situations that certain responses may be viewed as injurious to management or colleagues. While distributing the questionnaire, the researcher verbally informed all respondents who agreed to answer questionnaires that,

their participation was voluntary. They could, therefore opt out at any stage of the research process. They could also skip questions they did not know the answers otherwise any guess they made would be taken as a correct answer for analysis of the data. This was just to ensure that the researcher did not breach the ethical principle of voluntarism to participate in social research. Pieces of information cited from earlier studies on occupational health and safety to support analysis of the study were duly acknowledged through both in-test referencing and a bibliography. This was meant to avoid academic dishonesty or plagiarism. Findings cited in the literature review of this study were also duly acknowledged in line with the academic property law.

CHAPTER FOUR

ANALYSIS OF RESULTS

4.1 Introduction

The purpose of the study was to assess the knowledge level of small scale wood workers on industrial hazards and safety concerns in the wood industry. The analysis focused on the four main objectives of the study which included the socio economic characteristics, awareness level on safety practices, observance of existing safety practices and factors influencing safe practices. Probability was at 5% (P < value = 0.05).

4.2.1 Socio Characteristics of Small Scale Wood Workers

The Socio demographic data of the Respondents considered in this Study includes a total of 30 master craftsmen and 70 apprentices responded to the questionnaire. These figures represented 30% and 70% respectively of the total sample of 100 small scale wood workers. Among the master craftsmen, machine operators and carpenters were targeted to respond to the questionnaire including their apprentices. All respondents in the research were males even though there was provision for female respondents. This shows that the timber or wood working industry in the Kumasi Metropolis is a male dominated area. These findings are similar to the findings of Segun and Yahaya (2010) who found out that more males (70.31%) were engaged in sawmilling activities in Nigeria. Their findings also confirmed the FAO report of female tendency towards rural farming and trading activities as sited in Forestry Statistics (2003).

The respondents in the master craftsmen (table 4.1) indicated that 60% 18 respondents representing the machine operators and the remaining 21 respondents representing 40% were carpenters. The respondents among the apprentice indicated that 36% (25)

were machine operators whiles 64% (45) were carpenters out of the total respondents of 70.

4.2.2 The education Level of Respondents

The Educational level of the respondents was considered and the result in table 4.2 below indicates that 65% (13) had at least basic education, 15% (3) had secondary/ technical education, none had tertiary education and 20% (4) did not have any form of formal education. In the master carpenter category, 40% (4) had basic education 50% (5) had secondary/technical education and only 10 % (1) had tertiary education. In this category all the 10 respondents had some form of education. Among the apprentice machine operators, 40% (28) had basic education. Among the apprentice carpenters category, 40% (28) had basic education, 6% (4) had secondary/ technical education, 3% (2) had tertiary education and 11% (8) did not have any form of education at all.**4.2** Educational Level of the Respondents

		Category				
		Master Machine Operator	**Master Carpenter**	**Apprentice Machine Operator**	**Apprentice Carpenter**	**Total**
Level of Education	Basic	13	4	28	28	73
	Secondary/Technical	3	5'	0	4	12
	Tertiary	0	1	0	2	3
	None	4	0	0	8	12
Total		**20**	**10**	**28**	**42**	**100**

4.2.3 Statistics on Respondents

Among the age range of respondents in the sector it was realized (table 4.3) that the master machine operators recorded 0% (0) less than 20 years, 27% (8) were between 21-29 years, 27% (8) were between 30 - 39 years, 6.67% (2) were between 40 - 49 years and between 50 - 59 years recorded 0% (0). The master carpenter category, 0% (0) was recorded for less than 20 years, 6.67% (2) were between 21-29 years, 10% (3) were between 30 - 39 years, 13% (4) were between 40 - 49 years and 6.67% (2) were between 50 - 59 years. It also revealed that 70% (21) of the master craftsmen were in the active age group of 21 - 39 years.

Among the apprentice in regards to age it revealed that, 4% (3) were less than 20 years 17% (12) were between 21 - 29 years, 17% (12) were between 30 - 39 years, 0% (0) was recorded between 40 - 49 years and 50 - 59 years respectively. The carpenter apprentice recorded 20% (14)who were less than 20 years, 16% (11) between 21 - 29 years, 17% (12) between 30 - 39 years 10% (7) between 40 - 49 years and 0% (0) was recorded between 50 - 59 out of the total respondents of 100% (70) In table 4.2.3, the years of experience one had on the job that he did, considered the

		Master Machine Operator	Master Carpenter	Apprentice Machine Operator	Apprentice Carpenter	Total
Age	Under 20	0	0	3	14	17
	21-29 Years	8	2	12	11	33
	30-39 Years	8	3	12	12	35
	40-49 Years	2	4	0	7	13
	50=59 Years	0	2	0	0	2
Total		18	11	27	44	100

4.2.4: Years of Work by Woodworkers

Number of years one attained in the job. Among the master machine operators 6 (20%) each recorded in 0 - 5years and 6 - 10 years respectively. Between 11 - 15 years recorded 3(10%), 16 - 20 years recorded 2 (7%) and 21 and above years of experience recorded 4 (13%). Among the master carpenters, 3(10%) years of experience was recorded in 0 - 5 years range, 1 (3%) in 6 - 10, no record in 11 - 15 years, 2 (7%) in 16 - 20 years and 4 (13%) in 21 and above years in work. Among the apprentice category, the machine operators recorded 19% (13) of experience between 0-5 years, 13% (9) of experience between 6 - 10 years, 6% (4) of experience between 11 - 15 years, and 7% (5) of experience between 16 - 20 years. The record showed that none of them had experience above 21 years. Among the apprentice carpenters they recorded 29% (20) of experience between 0-5 years, 0% (0) of experience between 6 - 10 years, 14% (10) of experience between 11 - 15 years, 6 % (4) of experience between 16 - 20 years and 7% (5) of experience for 21 and above years in experience. One important finding among the apprentice was that some recorded between 10 to 20 years of experience due to the fact that they were still attached to their masters within the workshops because they could not access shops to establish their own shops.

Table 4.2.5: Years of Work by Woodworkers in Category

		Master Machine	Master Carpenter	Apprentice Machine	Apprentice	Total
No of years in work	0-5 Years	6	3	13	20	42
	6-10 Years	6	1	9	0	16
	11-15	3	0	4	10	17
	16-20	2	2	5	4	13
	21 And Above	4	3	0	5	12
Total		21	9	31	39	100

4.2.6 Wood Workers Opinion on the importance of Safety Practices

Table 4.5: The Need for Safety at the Workshops

Responses	Master Machine	Master Carpenter	Apprentice	Apprentice	Total
Strongly Agree	10	7	11	28	56
	10%	7%	11%	28%	56%
Agree	5	8	8	21	442
	5%	8%	8%	21%	42%
Don't know	0	0	2	0	2
	0%	0%	2%	0%	2%
Total	15	15	21	49	100
	15%	15%	21%	49%	100%

SOURCE: Fieldwork 2021

Wood workers response on the necessity for safety of workshops showed that 56% of them strongly agreed and 42% of them agreed that workshop safety is very important in enhancing safety at the work place. Among this category 19% of machine operating apprentice and 49% of carpenter apprentice were of a stronger opinion that safety was necessary. This shows how important safety is to apprentice since they carry out most of the minor jobs and are mostly prone to accidents.

Table 4.6: The Need for Servicing Machines to Enhance Safety at the Wood Workshops

Responses	Categor Master Machine Operator	Master Carpenter	Apprentice Machine Operator	Apprentice Carpenter	Total
Strongly Agree	10 10%	5 5%	18 18%	21 21%	54 54%
Agree	8 8%	7 7%	8 8%	23 23%	46 46%
Total	18 **18%**	12 **12%**	26 **26%**	44 **44%**	100 **100%**

Wood workers response on the necessity for servicing of machines showed that 54% of them strongly agreed and 46% of them agreed that machine servicing is very important in enhancing safety at the work place. In this category 18% of machine operating apprentice and 21% of carpenter apprentice were of a strong opinion that servicing is necessary. This indicates how valuable servicing of machines is to apprentice since they carry out most of the minor jobs. The low agreement by masters indicate how prone apprentice are to the risk of being injured by machines without regular servicing since the decision to service a machine or otherwise is taken by the masters who execute only major activities in the shop. Segun and Yahaya (2010) in their study of small scale sawmills in Nigeria observed that a risk factor easily noticed in most of the sawmills is the age factor of machines and equipment's in use where most of them are obsolete and their safety guards removed or non-functional which is a major factor for the occurrence of accidents. This confirms the fact that machine servicing is very necessary in our small scale wood workshops.

Table 4.7: The Need for Cleaning Machines and Work Environment

Category

Responses	Master Machine Operator	Master Carpenter	Apprentice Machine Operator	Apprentice Carpenter	Total
Strongly Agree	18	10	1 1	29	68
	18%	10%	11%	29%	68%
Agree	0	2	10	20	32
	0%	2%	10%	20%	32%
	18	12	21	49	100
Total	**18%**	**12%**	**21%**	**49%**	**100%**

The respondents were asked the need for cleaning and organizing their work places for enhance working environment, all (100%) of the respondents absolutely agreed that daily cleaning of the shops is important since that promotes good health to the workers and also makes movement of workers and tools around the environments more easily for the day to day running of the shop.

	Category				
Response	**Machine Oper**	**Machine Master**	**Apprenti Operat**	**Machine Apprent**	**Total**
Strongly Agree	8 8%	4 4%	5 5%	3 3%	20 20%
Agree	4 4%	4 4%	8 • 8%	13 13%	29 29%
Disagree	4 4%	1 1%	6 6%	4 4%	15 15%
Strongly Disagree	3 3%	2 2%	7 7%	13 13%	25 . 25%
Don't Know	0 0%	0 0%	4 4%	7 7%	11 11%
	19	II	26	40	100
Total	**19%**	**11%**	**26%**	**40%**	**100%**

From Table 4.8 20% of the respondents completely agreed that factory inspectors do visit them with 29% of them agreeing. However, 25% of the respondents of them strongly disagreed and 15% of them disagreed whilst 11% of them were those who did not know if factory inspectors came around. The higher number of respondents (50%) disagreeing and did not know about the visits by law enforcement agents indicates that factory inspectors do not regularly go to enforce safety regulations or they just visit few workers infrequently or in effect there may be no standard regulations on safety to be implemented.

The African newsletter on occupational health and safety (2005) reported on the study: *"wider perspectives for workers' safety and health through labour inspection"* that the informal sector is not traditionally covered by labour inspection, although there is a change now going on in Africa. The countries are in phases of development concerning

the development of occupational safety and health legislation. It further stated that Swaziland renewed its legislation in 2001 and Tanzania in 2003 to cover all workplaces, whiles Ethiopia, Ghana, Kenya and Uganda have draft legislation ready to be renewed to cover the informal sectors in their various countries.

Table 4.9: Master Craftsmen Reminded Their Apprentices of Safety during Work

	Category				
	Master Machine	**Master Carpenter**	**Apprentice Machine**	**Apprentice Carpenter**	**Total**
Strongly Agree	10	1	19	18	48
	11.0%	1.0%	19.0%	17.0%	48.0%
Agree	6	8	7	19	40
	6.0%	8.0%	7.0%	19.0%	40.0%
Disagree	0	1	0	0	1
	.0%	1.0%	.0%	.0%	1.0%
Strongly Disagree	0	0	0	8	8
	.0%	.0%	.0%	8.0%	8.0%
Don't Know	1	2	0	0	3
	1.0%	2.0%	.0%	.0%	3.0%
Total	17.0%	12.0%	26.0%	45.0%	100.0%

The results clearly show that wood workers are constantly reminded on safety measures by shop owners. Therefore, 48% and 40% of the respondents strongly agreed and agreed respectively to safety reminders been issued. Moreover, reminders on safety measures are higher among machine operator apprentices and carpenter apprentices, representing 19% and 17% respectively perhaps due to the high risk tendencies.

Table 4.10: Spearman Correlations on Ranked Variables

	Is safety necessary	Is servicing necessary	Is daily cleaning necessary	Do fact, inspectors visit you	Are you reminded on safety
Is safety necessary	1.000				
Is servicing necessary	0.324** (0.001)	1.000			
Is daily necessary	-0.183 (0.068)	0.141 (0.161)	1.000		
Do factory inspectors visit you	-0.179 (0.075)	0.040 (0.693)	0.402** (0.000)	1.000	
Are you reminded on safety	-0.014 (0.886)	0.045 (0.656)	-0.075 (0.459)	0.210* (0.036)	1.000

Correlations among the variables show a positive and significant relationship on perception of safety and servicing with coefficient of 0.324 significant at 1%. This means that respondents perceive servicing as an enhancement of safety at the shop and hence servicing in the shops must be emphasized and wood workers sensitized on the importance of servicing. Visits and daily cleaning are positively correlated with a coefficient of 0.402 and significant at 1%. This means that intensive cleaning is done when inspectors serve notice of their visits to shops. This also indicates inspectors' insistence on cleaning and arrangements of tools and equipment in the various shops at the Accra timber Market. Reminders on safety regulations and visits of factory inspectors are positively correlated at 5% significance level with a coefficient of 0.210. This clearly demonstrates the strict enforcement of safety measures and constant reminders on safety enhancing activities in the shops that strongly agreed (20%) on factory inspectors visits.

Table 4.11: Ho: There are no Significant Differences in Safety Awareness among Masters and Apprentice.

		Sum of Squares	df	Mean Square	F value	Sig.
Is safety necessary	Between	1.591	3	.530	1.074	.364
	Within	47.409	96	.494		
	Total	49.000	99			
Is servicing necessary	Between Groups	.963	3	.321	1.291	.282
	Within	23.877	96	.249		
	Total	24.840	99			
Is daily cleaning necessary	Between Groups	3.162	3	1.054	5.440	.002
	Within	18.598	96	.194		
	Total	21.760	99			
Do fact. inspectors visit you	Between Groups	47.322	3	15.774	11.414	.000
	Within	132.678	96	1.382		
	Total	180.000	99			
Are you reminded safety	Between Groups	15.623	3	5.208	5.711	.001
	Within	87.537	96	.912		
	Total	103.160	99			

Factor is job categories

An analysis of variance of awareness on safety measures at the shops indicates that significant differences in awareness of safety measures among masters and apprentices in terms of daily cleaning with an F value of 5.44, factory inspectors' Visits with 11.414 statistic and reminders on safety with 5.711 F value. Masters and apprentices have different levels of awareness since apprentices cleaned the shops but masters were more cautious on the safety reminders by factory inspectors since fines are paid by the masters when the instructions of inspections are not fully

implemented. However, the overall awareness and genuine efforts to on general safety and servicing was not different among both masters and apprentices and as such we fail to reject the null hypothesis of no different awareness levels among wood workers of the Accra Timber Market in terms of the necessity of safety and equipment servicing.

Ho: the variable is not independently distributed

Table 4.12: Test of Independence

Variable	X2	df	*p-value*	Interpretation *Decision*	
Use of Overcoat	1.579	2	0.454	NS	Reject H1
Use of Nose Musk	17.392	4	0.002	S	Reject Ho
Use of Goggles	1.675	4	0.795	NS	Reject H1
Use of Safety Guards	16.085	3	0.01	S	Reject Ho
Have circuits	13.878	3	0.003	S	Reject Ho
Fire Equipment	8.124	3	0.044	S	Reject Ho
Injuries	4.516	3	0.211	NS	Reject H1
Skin Disorders	28.376	6	0.00	S	Reject Ho
Briefing problems	56.69	6	0.00	s	Reject Ho

NS means not significant at 0.05 levels, S means significant at 0.05 levels

A chi square test of independence on the use of **overcoat** indicates an insignificant randomness meaning that masters do not insist on apprentice wearing overcoats though they wear it themselves. A chi square test of independence for the Respondents who always wear nose musk were 12% and those who used it sometimes were 38 in number. Those who do not use nose musk at all were the majority, representing 50% with all carpenter masters using musk always or sometimes. This exposes wood workers to health hazards such as briefing problems and other inhalable diseases.

Table 4.14: **The Use of Nose Musk during Working Periods at the Accra Timber Market Workshops.**

		Job Group			
		Machine Operator	**Carpenter**	**Apprentice**	**Total**
Usage of musk during working	Always	2 2.0%	1 • 1.0%	9 9.0%	12 12.0%
	sometimes	6 6.0%	11 11.0%	21 21.0%	38 38.0%
	not at all	15 15.0%	0 .0%	35 35.0%	50 50.0%
Total		23 23.0%	12 12.0%	70 65.0%	100 100.0%

Table 4 .15: The use of Eye Protector

		Job Group			**Total**
		Machine Operator	**Carpenter**	**Apprentice**	
The use of goggles	**Always**	4 4.0%	1 • 1.0%	13 13.0%	18 18.0%
	sometimes	2 2.0%	3 3.0%	13 13.0%	18 18.0%
	not at all	14 14.0%	6 6.0%	44 44.0%	64 64.0%
Total		20 20.0%	10 10.0%	70 70.0%	100 100.0%

X2=0.795

Majority of the respondents do not use any eye protection device such as goggles. It further shows that 18 per cent of them used goggle all the time as well as sometimes in the shop and 64 per cent never used eye protecting equipment.

Tables 4.13 - 4.15 shows the high levels of workers not using the appropriate safety protective wear in their routine works. This result is in agreement with the findings of Steven (2012) where the use of personal protective equipment was poor and inappropriate in the wood processing industries in Zimbabwe. All workers apart from management and medical staff acknowledged receiving a pair of security shoes/boots and two overalls every year. The workers could be seen wearing their nose masks, but some had the nose masks and goggles on their foreheads without proper overalls as they found them uncomfortable.

Table 4 .16: The Availability of Safety Guards and Usage in the Timber

		Category				Total
		Master Machine Operator	Master	Apprentice Machine	Apprentice Carpent	
Have Safety Guards	Yes	9	3	21	16	49
		9.0%	3.0%	21.0%	16.0%	49.0%
	NO	9	9	5	28	51
		9.0%	9.0%	5.0%	28.0%	51.0%
Total		18	12	26	44	100
		18%	12%	26%	44%	100%

Market Workshops

5(2=0.001

Respondents who do not use safety guards represent 51 per cent and 49 per cent use safety guards. The test of independence indicates the data to be randomly distributed as shown in table 4.12. This exposes the respondents to injuries at work.

Table 4.17: The Availability of Circuit Breakers at the Wood Workshops

		Category				Total
		Master Machine Operator	**Apprentice Master**	**Machine**	**Apprentice Carpenter**	
Have circuit breakers	Yes	14	2	19	28	63
		14.0%	2.0%	19.0%	28.0%	63.0%
	No	4	10	7	16	37
		4.0%	10.0%	7.0%	16.0%	37.0%
Total		18	12	26	44	100
		18%	**12%**	**26%**	**44%**	**100%**

5(2=0.003

A lot of the respondents (63%) said they do have circuit breakers within their workshops to help them cut-off power supply to the machines in case of an accident involving a worker on a machine. Whiles 37 per cent said they did not have circuit breakers in their wiring system at their workshops; hence they could be prone to prolonged electrical injuries when such incidents happen.

In table 4.18, as high as 94 per cent of the respondents do not have firefighting equipment in their shops clearly exposing them to injuries and loss of property during fire out breaks. Fire safety measures are not also observed among wood workers as well.

Table 4.18: The Availability of Fire Equipment at the Timber Market Wood Workshops

Category		Master Machine Operator	Master-Carpenter	Apprentice Machine Operator	Apprentice Carpenter	Total
Have lire equipment	Y	0	0	0	6	6
		.0%	.0%	.0%	6.0%	6.0%
	No	18	12	26	38	94
		18.0%	12.0%	26.0%	38.0%	94.0%
Total		18	12	26	44	100
		18%	12%	26%	44%	100%

J(2=0.U44

Table 4.19: The Occurrence of Injuries at the Workshop Category

		Master Machine Operator	Master Carpenter	Apprentice Machine Operator	Appren Carpenter	Tota
		14	7	23	35	79
Ever injured work	Yes	14.0%	7.0%	23.0%	35.0%	79.0
		4	5	3	9	21
	No	4.0%	5.0%	3.0%	9.0%	21.0
Total		18 **18%**	12 **12%**	26 **26%**	44 **44%**	100 **100%**

SOURCE: Fieldwork 2021

The results in table 4.19 show that 79 per cent of workers had an injury in the shop with majority of those injured being machine operator apprentice group experiencing the highest accident rate of 23 per cent. This evidently shows the lack of adherence to safety standards among wood workers in the Kumasi metropolis. In Nigeria, a study of wood processing industries was carried out and found that, a total of 140 injury cases were recorded among 64 workers. lt was also found that none of the workers had attended safety training in the previous years. In most cases most of the workers entered the timber industry not as trained wood workers. This had exposed most of the workers to some untold level of hazards (Segun2010). This revelation could account for the high injury rate of 79.0%.Also the high rate of injuries among this group could be due to lack of training or experience in the job.

Table 4.20: Reports of Skin Disorders by Workers at the Workshops

		Category				
		Category				
Total		**Master Machine Operator**	**Master Carpenter**	**Apprentice Machine Operator**	**Apprentice Carpenter**	
Have you ever had skin disorders/problems	Always	6	1	2	3	12
		6.1%	1.0%	2.0%	3.0%	12.1%
	Sometimes	10	11	8	17	46
		10.1%	11.1%	8.1%	17.2%	46.5%
	not at all	2	0	15	24	41
		2.0%	.0%	15.2%	24.2%	41.4%
		18	12	25	44	99
Total		**18.2%**	**12.1%**	**25.3%**	**44.4%**	**100%**

Skin problems that sometimes account for skin disorders represented by 46.5% and 12.1% frequently experienced skin problems. This is the consequence of hazardous conditions under which these workers do work. Steven (2012) in his study on occupational, health and safety problems among wood workers in Zimbabwe found that workers were highly exposed to a range of hazards. In this study 340 workers

participated in the survey. Half of the workers reported at least one health complaint, such as skin burn, sore, redeyes, and headache and chest/throat pains. This accounted for more than 74% of the workers indicating these disorders. This study confirms the findings in table 4.20 with 58% of the workers reporting haven had skin problems sometimes or always.

Table 4.21: Reports on Briefing Problems/Disorders by Workers at the Workshops

		Category				
		Master Machine Operator	**Master Carpenter**	**Apprentice Machine Operator**	**Apprentice Carpenter**	**Total**
Do you have briefing problems due to inhalation of sawdust	Always	5 5.0%	1 1.0%	9 9.0%	0 .0%	15 15.0%
	Sometim	8 8.0%	11 11.0%	3 3.0%	6 6.0%	28 28.0%
	Not At All	5 5.0%	0 .0%	14 14.0%	38 38.0%	57 57.0%
	Total	**18** **18.0%**	**12** **12.0%**	**26** **26.0%**	**44** **44.0%**	**100** **100.0**

X2=0.000

Respondents who constituted 28% had briefing problems and severe among master carpenters who accounted for 11% and 15% had consistent briefing problems as a result of the job. This could be as a result of continuously working in dusty environments without adequate protection from dust. This findings confirms what Steven (2012) found in Zimbabwe. According to Steven (2012) in the discussion of

his results on Occupational health and safety problems among workers in the wood processing industries in Mutare, Zimbabwe mention that exposure to sawdust is liable to cause dermatitis and allergic respiratory infections. He also emphasized that the majority of machine operators in Australia are reported to have been diagnosed of respiratory infectious diseases due to wood dust inhalation.

4.2.3factors Influencing Safe Practices at the Various Workshops

Ho: the variable is not independently distributed

Table 4.22: Test of Influence on the Various Job Categories

Variable	X2	**df**	***p-value***	Interpretation	***Decision***
Experience	**31.1**	4	0.00	S	Reject Ho
Education	125.04	**3**	0.00	S	Reject Ho
Training on safety	27.04	**1**	0.00	S	Reject Ho
Pictures on site	96.04	1	0.00	s	Reject Ho
Safety	54.76	**1**	0.00	s	Reject Ho

4.2.4 Chi Square Test of Determinants on Safety Measures Among Masters and Apprentices

To test for the influence of the various explanatory variables and their influence on safety practices in the Accra timber market, a chi square test statistics was conducted on respondents' experience, education, training on safety and on the job, pictures on the site and whether respondents observe safety practices.

4.2.5 Experience

Experience is the number of year's masters and apprentices have been on the job. The chi square test result J^2 (q7'4) = 31.1 with a p-value of 0.00 means that the number of years craftsmen have been in the job determines how they observe safety practices.

Craftsmen with longer years on the job are likely to put in place safety measures at work and instruct younger ones to observe them. Safety measure policy should target people with less experience in the workshop.

4.2.6 Education

Education is the number of years in formal school and the test of *x*~ (#3) = 125.04 and a p-value of 0.00 means that those with higher number of years in school are likely to observe safety practices at work.

4.2.7 Training on Safety

Results show that training on safety influences the extent to which they observe safety regulations in the workshop. A test show a probability value of 0.00 with a test statistic of *JC {dfX)* - 27.04. Training on safety practices should be encouraged periodically and shop owners must be regulated to enforce safety practices.

4.2.8 Pictures on Safety at the Site

The likelihood ratio test /^{2}(q{fl) = 96.04 on Pictures depicting the consequences of disregard for safety practices and other pictures on best safety practices do influence respondent attitudes toward safety measures in the various workshops in the Accra timber market at 99% confidence interval. The factory inspectors should take pictures of accidents and other relevant information on safety to be distributed to all workshops for display since the pictures remind both masters and apprentices to be cautious at work.

4.2.9 Observation of Safety Rules

A test of significance show probability value of 0.00 means observation of safety rules influences safety measures at 99% confidence interval and a chi square value of $X^1\ (df\backslash) = 54.76$. This means that respondents' who observe laid down rules do experience fewer accidents in their workshops. New workshop owners must be educated thoroughly on the safety rules and regulations.

4.3 Summary of Findings

The findings of the study on the knowledge of small scale wood workers on industrial accidents revealed the following results. Among the 100 respondents interviewed, both the master craftsmen and the apprentice failed to recognize that fire is one of the devastating accidents that could occur at their workplace and lead to loss of human life and property. Hence none of the categories saw the need to keep fire safety equipment's like fire - extinguishers, sand etc. at their workplaces except 6(6%) of the apprentice carpenters responded they had seen some fire safety equipment in their workshops. Also, majority of the master craftsmen and apprentice were in the basic education level where most of them could not complete their basic education. This suggests that their knowledge on preventing accidents could be low among this group due to inability to read instructions and manual that come with the machines.

Furthermore, in both groups, it was recorded that all the respondents were males and were between 0-39 years 91(91%). This findings is consistent with the findings of Segen and Yahaya (2010)in their study of small scale sawmills in Nigeria

The other important issue is on frequency of training programmers on prevention of accidents. Majority of the master craftsmen i.e. 19 (of 30) had attended a training programme on safety, meanwhile a majority of the apprentice did not have access to

training forming a total of 65 out of 70 population interviewed.

Another major finding was on whether workers had been injured at work before. In the masters category, 21(21%) of them indicated they had had an injury and 58(58%) of the apprentice also indicating the occurrence of injury among them.

Upon observation around the workshops there was the absence of instructional manual on machines, no clear exist points in case of danger, a lot of sawdust accumulation around machines and there was no pictures warning the artisans and visitors who visited their work places on possible accidents. This could pose serious danger to people in the workshop as shown in plate 4.1 and 4.2. Last but not least, 81 % of the apprentice reported that when they were first enrolled into the work, no formal training on safety was given to them

CHAPTER FIVE

5.1 Discussion

This chapter discusses the results and findings of the study based on the research findings gathered by the questionnaire used. However, the chapter is discussed on the following areas.

- Age/ number of year in employment
- Level of education of artisans
- Training programmes
- Workshop layout
- General safety concerns
- General maintenance concerns
- Activities of factory inspectors

5.1.1 Age/Number of Years in Employment or Training

The research findings revealed that 16(24%) of the apprentice were below the 20 years range. The likelihood that some of them may be less than **18** years is great. If this happens, the group could have a very low level of appreciating the dangers involved in the industry and could lead to high level of accident cases in the industry. This assumption is agreeable with the quarterly report recorded by the Regional Labour Department on the Kumasi Metropolitan district that shows a rise in industrial accidents (table 1.1.) within its catchment area.

The research also revealed that 42(60%) apprentice have work experience only on the job and fall in the category of below 5 years. This could be a recipe for danger due to lack of experience on handling and working with the machines. This could lead to high incidence of industrial accidents.

5.1.2 Level of Education of Artisans

The study revealed that majority of the small scale wood workers (73%) terminated at the basic level of education. Through interactions with Apprentice it revealed that some could not complete successfully at this level. It also revealed that most of their machines were locally made and therefore no operational manual is attached to these machines and the few that were imported with operational manual due to artisans low educational background could not read but operated on experience form similar machines and where operational directions are not similar could lead to wrong operations which could also lead to occurrence of accidents.

According to Segun and Yahaya (2010) most artisans are less educated; therefore, the reading and answering of questionnaire items could take a lot of time.

5.1.3 Training Programmes

Information collected from the questionnaire revealed that more than half 19(63%) of the 30 Master craftsman responded that they had the opportunity to attend some training programmes on safety, while 65(93%) of the Apprentice did not have the opportunity to attend any training programme on safety. This percentage among the Apprentice is alarming in relation to knowledge of preventing accidents in the wood working industries.

Also, the Apprentice 57(81%) of the 70 population reported that they did not undergo any training session on preventing accidents before being introduced to the use of the machines and tools when they are newly enrolled or employed. By this information, there is the possibility that the rate of accidents could be higher among the Apprentice.

Segun and Yahaya (2010) in their study stated that “none of the workers had at any

time attended any safety training in the number of years they have been into the job. The knowledge acquired is based on the apprenticeship training and experience gathered on the job. In some cases, many entered the industry as traders and not as a trained wood industry worker with requisite professional knowledge. This has exposed the workers to some untold level of hazards".

According to an ILO module on occupational health and safety (2008), workers often experience work-related health problems and do not realize that the problems are related to their work, particularly when an occupational disease, for example, is in the early stages. Besides the other more obvious benefits of training, such as skills development, hazard recognition, maximization of man hours etc., a comprehensive training programme in each workplace will help workers to recognize early signs or symptoms of any potential occupational diseases before they become permanent conditions.

5.1.4 Workshop Layout

According to the European Agency for Safety and Health at Work, (2009) good organisation of work premises creates safer working conditions and improves productivity. The objective of good organisation therefore is to prevent unsatisfactory work layouts that lead to injuries by helping company managers define their needs before the layout is finalized. The idea is to place greater emphasis on the work people actually do when designing work premises. This sort of planning avoids expensive mistakes that are difficult to rectify once the workplace is finalized. It eliminates or reduces occupational risks while optimizing work flows. Inappropriate layout of workspaces can have severe consequences such as risks of injuries at work, risks of occupational diseases due to noise, chemical pollution etc.

The research findings revealed that 29(97%) of the Master craftsmen reported that they did not have pictures and posters in their workshops directing movement and other activities in the workshops. A visit to the study area and their workshops revealed that they did not have proper workshop layouts.70 (100%) of the Apprentice reported same. Upon interactions they reported that their workshops were over crowded with work pieces making movement around the workshops very difficult.

The above declaration indicates that the workshops in this study area are not adequately laid out. Therefore there is the need for the design of proper layouts at the study area to help these workers prevent accidents that may arise due to improper utilization of workshop space.

5.1.5 General Safety Concerns

Reference to table 4.13 the analysis shows that 18 (60%) of the Master craftsmen reported that they do not teach their apprentice to use or wear safety clothing (overcoat) and other protective equipment whiles at work. 18(60%) also reported they do not have safety guards and fences on their machines they work with (table 4.16).in reference to table 4.18 it is reported that all the Master craftsmen did not have any of the fire safety equipment in their workshops.

The findings above declare that the knowledge level of Master craftsmen on safety concerns is low. However, they all agree that safety at their work places is very necessary, reference to table 4.5. The Apprentice on the other hand showed low knowledge on safety concerns.

On seeing the way the artisans abuse safety practices, one becomes worried as to whether these artisans are aware of industrial safety measures and healthy practices. In the same way, one cannot say whether the agencies responsible for checking the

safety and health situations of artisans in Accra timber market are doing their work or not. According to the Occupational Safety and Health Administration (2008), occupational safety and health [OSH] is a cross-disciplinary area concerned with protecting the safety, health and welfare of people engaged in work or employment. Poor working conditions at Accra timber market have the potential to affect artisans' health and safety. The poor working conditions can also affect the environment artisans live in, since the working and living environment are the same for many artisans. Therefore the issues of health must be addressed. According to the ILO, when health is addressed, so is safety, because a healthy workplace is also a safe workplace.

5.1.6 General Maintenance Concerns

The culture of maintenance within the study area has been a problem over the years. An interaction with the woodworkers at the Accra timber market revealed that they do not have routine maintenance schedules and only carry out maintenance anytime a machine breaks down. This attitude could lead to untimely breakdown and during this process, accidents could occur. A major risk factor easily noticeable in most of the workshops is the age factor of the machines and equipment in use. Most of the machines are obsolete with their safety guards removed or non-functional. (Segun and Yahaya2010).Information gathered on whether maintenance or servicing was necessary, in tables 4.6 saw both Master craftsmen and Apprentice all agreeing to the statement.

The information gives a clear way for the design of maintenance schedules to help the woodworkers prevent the untimely breakdown of machines which sometimes lead to the loss of man hours.

5.1.7 Activities of Factory Inspectors

According to the Labour Act 2003 section 124 subsection (1) (h), inspectors have the power to "*direct employers to carry out alterations to buildings. installations, and plant, necessary to avert any danger or threat of danger to the health or safety of the workers within such period as may be specified in the direction,*

" In preventing accidents at our industries, Factory Inspectors have a major role to Play in this regard since they have authority by law to see to it that factories follow right procedures in their operations as stipulated by law.

Information gathered from the wood workers show that 20(67%) of the Master craftsmen acknowledged the factory inspectors do visit them while 10(33%) disagreed they visited (table 4.8).In reference to tables 4.8, 31 (44%) of the apprentice reported that the factory inspectors do not visit because they have not seen them since they were enrolled onto the apprenticeship programme.

In view of the above information, if factory Inspectors should intensify their visits and include sensitization on safety it will put the wood worker on a better pedestal to constantly remind themselves on safety and also working towards its prevention for safe working environment.

Segun and Yahaya (2010) observed that, "*none of the companies had any safety policies. materials, etc., in place, but a reliance on workers responsibility to provide the appropriate personal protection device, to have a safe work environment. Focus should be on these challenges in practical terms to form a safety legislation, comprehensive systems approach and monitoring group in the industry to guide the management in the implementation in order to reduce or eliminate workplace hazards' '.*

5.2 Summary of Findings, Conclusion and Recommendations.

5.3 Summary of Findings.

The main findings of the study are as follows:

1. Majority of the Master craftsman and their apprentice among the 100 respondents interviewed either terminated at the basic level of education i.e. not able to complete or would have completed the level but could not further their education. Most of them could not also read simple instructions on machines.
2. Majority of the workforce were under the age of 20 and have not yet acquired or developed self-consciousness towards the occurrence of accidents.
3. Apprentices are not formally educated on safety when they are newly enrolled or employed to work in the industries but adopt safety consciousness on the job.
4. Training offered to the workers by WITC, AMA and other development partners on safety from time to time may not usually cover the apprentices but rather they learn this as they are on the job.
5. There is no adequate workshop layout in the shops due to lack of available space. Pieces of timber are always scattered all over the floor forcing attendants to find their own way out of the shop in case of danger. This can be seen in plate 6.1 below.

Even though the workers (respondents) indicated that they observe safety, however it was revealed that they assume to know the operational procedures and would not border using safety clothing and protective devices. They also complained of not

being comfortable when using some of the safety clothing and protective gadgets like the nose mask. Hence the reason why most of them responded they did not use them whiles at work.

It also came to light that about 50% of the respondents did not have adequate guards and fences on their machines.

7. More than 90% of the respondents reported that they did not have fire safety equipment at all at their workplaces.
8. The respondents indicated that when accidents occur, it is the hand (fingers) that is mostly affected.
9. All the respondents agreed that there was the need for safety at the shops, regular maintenance, and regular education seminars on industrial safety.

5.4 Conclusions

The following conclusions were made based on the assessment of a section of woodworker's knowledge on safety practices at their shops in Accra timber market.

- Little attention was given to safety and safe work environment by the workers, very poor organization and layout of raw materials and finished products at their work area.
- In addition, majority of the small scale wood workers interviewed acquired knowledge on safety concerns and years of experience on the job. Hence, they lacked professional safety approaches to their work.
- Furthermore, personal protective devices such as earmuffs or plugs, hand gloves, nose mask, safety shoes, over coat were not used adequately and considered as not important and disturbing. (Plate 4.1 and 6.2 above).
- Also, there was a lot of wood shavings and sawdust around machines and work

areas which might lead to obstructions. (Plate 4.2 above).

- Another important fact is about the workers lack of knowledge on safely policies, guidelines and directions to employers and employees in the wood industry.
- Finally and not least, all these findings and observation fall in line with earlier research work done on industrial safety by Segun and Yahaya (2010).

5.5 Recommendation

The following recommendations are offered to help improve upon the knowledge of small scale wood workers on safety concerns.

- The Labour/Factory Inspectorate department should be provided with adequate resources and equipment and also be encouraged to embark on intensive supervision and training to improve on the wood workers knowledge.
- Also, Governments should develop interest into the safety of woodworkers to help reduce the burden on compensation paid to injured workers, encourage and sponsor private organizations that have expertise on industrial safety to educate woodworkers on safety concerns.
- Furthermore, Factory Inspectors should enforce the existing laws which mandate employers to provide workers with safety clothing and devices like safety shoes, gloves, masks, fire extinguishers etc and to see to it that employees use them appropriately.
- Employers in the sector should be encouraged to provide guards and fences and all safety accessories on all their machines before they are used. Also the employers should be mandated to train their apprentices and newly employed workers on safety before they are permitted to work with machines. It should also be mandatory on employers to organise training sessions on safety

periodically so as to increase the knowledge of workers on safety in the industry. Laws on child labour should be enforced and made known to the workers in other to prevent children who are less than 18 years from getting into apprenticeship training.

5.6 Suggestions for Future Research

Further study could be carried out on the best waste management practices to decongest the workshop area of heaps of wood shavings and sawdust.

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APPENDICES

APPENDIX I

UNIVERSITY OF EDUCATION, WINNEBA-KUMASI

COLLEGE OF TECHNOLOGY EDUCATION

DEPARTMENT OF CONSTRUCTION AND WOOD TECHNOLOGY EDUCATION

QUESTIONNAIRE

This questionnaire is intended to conduct a research work on the topic. ***Assessing the knowledge of woodworkers on industrial hazards and personal safety concerns at the Accra Timber Market in the Accra metropolis. The*** researcher is a Master of Technology, Wood Science and Technology student.

Accra has been selected due to the concentration of wood workers who are the target group in this research. The research is for academic purpose and any information provided would be held confidential.

Please provide honest answers to the questions and statements by ticking (√) appropriately.

QUESTIONNAIRE FOR MASTER CRAFTSMEN. BIO - DATA

Gender: Male [ ] female [ ]

Age: Under 20 years [ ]

21-29 years [ ]

30-39 years [ ] 40-49 years [ ]

50-59 years

60 years and above [ ]

Level of Education: [ ]

Basic [ ]

Secondary/Technical [ ]

Tertiary [ ]

None [ ]

Occupation: [ ]

Machine operator [ ]

Carpenter [ ]

LEVEL OF KNOWLEDGE AND COMMITMENT TO SAFTEY

1. How long have you been working in the saw mill?

0-5 years [ ] 6-10 years [ ]

11-15 years [ ] 16-20 years [ ]

21 and above [ ]

2. Do you organise training sessions on safety on the job for your apprentice regularly?

Yes [ ] No [ ]

3. Do you give training to your apprentices about the job when they are newly employed?

Yes [ ] **No [ ]**

4. Do you have pictures posted around your workshop prompting you and your apprentices on safety precautions?

Yes [ ] No[ ]

5. Do you teach your apprentices to observe safety rules and regulation whiles at work?

Yes [ ] No [ ]

6. Do you teach your apprentices to wear or use safety clothing whiles at work?

Yes [ ] No[ ]

7. Do you have safety guards and fence on the machines you work with?

Yes [ ] No [ ]

8. Do you have power cut-off leading to your machines in case of any accident?

Yes [ ] No [ ]

9. Do you have fire safety equipments like extinguishers at your work place?

Yes [ ] No [ ]

10. Have you or your apprentices ever been involved in any accident while working?

Yes [ ] No [ ]

11. Which part of the body is affected when injury occur at your work place?

Head [ ] Hand [ ] Leg [ ] Body [ ]

12. Do you provide your apprentice with nose covering equipments such as musk?

Always [ ] Sometimes [ ] Not at all [ ]

13. Do you provide your apprentice with eye protecting equipments such as goggles?

Always [ ] Sometimes [ ] Not atall [ ]

14. Have you or your apprentices ever had briefing problems due to inhalation of sawdust?

Always [j Sometimes [ ] Not atall [ ]

15. Have you or your apprentices ever had skin disorders/problems?

Always [ ] Sometimes [ ] Not at all [ ]

Please indicate the level of agreement or disagreement to the following statements.

Statements	**Strongly Agree**	**Agree.**	**Disagree**	**Strongly disagree**	**Don't know**
16. safety of workers at the saw mills is very necessary					
17. Servicing of machines is very necessary to prevent accidents and injuries					
18. Daily cleaning of the workshop area is necessary to promote safety at work					
19. Do Factory inspectors visit your workplace to educate you on safety?					
20. I constantly remind my apprentices of safety practices at the work place					

APPENDIX II

UNIVERSITY OF EDUCATION, WINNEBA-KUMASI

COLLEGE OF TECHNOLOGY EDUCATION

DEPARTMENT OF CONSTRUCTION AND WOOD TECHNOLOGY EDUCATION

QUESTIONNAIRE

This questionnaire is intended to conduct a research work on the topic. Evaluating the knowledge of wood workers on industrial safety precautions and hazards in the Accra

Metropolis The researcher is a master of Technology wood science and Technology student.

Accra has been selected due to the concentration of wood workers who are the target group in this research. The research is for academic purpose and any information provided would be held confidential.

Please provide honest answers to the questions and statements by ticking (√) appropriately.

Gender: Male [ ] female [ ]

Age: Under 20 years [ ]

21-29 years [ ]

30-39 years [ ] 40-49 years [ ]

50-59 years

60 years and above [ ]

Level of Education: [ ]

Basic [ ]

Secondary/Technical [ ]

Tertiary [ ]

None [ ]

Occupation: [ ]

Machine operator [ ]

Carpenter [ ]

LEVEL OF KNOWLEDGE AND COMMITMENT TO SAFTEY

1. How long have you been working in the saw mill?

0-5 years [ ] 6-10 years [

11-15 years [ ] 16-20 year]

21 and above [ ]

2. Have you ever attended any training on safety about the job you are doing?

Yes [ ) No [ ]

3. Do you normally undergo training about the job when you are first employed?

Yes [ ] No [ ]

4. Do you have pictures posted around your workshop prompting you on safety?

Yes [ ] No [ ]

5. Do you observe safety rules and regulation whiles at work?

Yes [ ] No [ ]

6. Do you wear or use safety clothing whiles at work

Yes [ ] No [ ]

7. Do you have safety and fence on the machines you work with?

Yes [ ] No [ ]

8. Do you have power cut-off leading to your machines in case of any accident?

Yes [ ] No [ ]

9. Do you have fire safety equipments like extinguishers at your work place?

Yes [ ] No [ ]

10. Have you, or your friend ever been involved in any accident while doing your work?

Yes ( ] No [ ]

11. Which part of the body is affected when injury occur in your work place?

Head [ ] Hand [ ] Leg [ijlody [ ]

12. How often do you use nose covering equipments such as musk when working?

Always [ ] Sometimes [ ] Not at all [ ]

13. How often do you use eye protecting equipments such as goggles?

Always [ ] Sometimes [ ] Not at all [ ]

14. Do you have briefing problems due to inhalation of sawdust?

Always [ ] Sometimes [ ] Not at all [ ]

15. Have you ever had skin disorders/problems such as sores? Always [ ] Sometimes [ ]Not at all [ ]

Please indicate the level of agreement or disagreement to the following statements.

Statements	**Strongly Agree**	**Agree**	**Disagree**	**Strongly disagree**	**Don't know**
16. safety of workers at the saw mills is very necessary					
17. Servicing of machines is very necessary to prevent					
18. Daily cleaning of the workshop area is necessary to					
19. Do Factory inspectors visit your workplace to educate you					
20. lam constantly reminded of safety practices at the work					

1.2.1 Accra Metropolitan Labour Department, Greater Accra Region

NO. YEAR FATALNON-FATAL PENDING CASES REPORTED CASES

Table **1.1 Records of Accidents in the Forestry and Timber Industries** QUARTERLY REPORT: ACCRA DISTRICT

	SETTLE	SETTLE	FATAL	NON FATAL	FATA	NON	GH₵
2007							
4TH QTR	1	8	-	545	-	17	8.683.00
2008							
IST QTR	-	13	-	-	2	22	7,948.88
2ND QTR	-	13	1	20	-	-	1,500.00
3RD QTR	-	10	-	-	-	10	7,946.10
4TH QTR	1	27	-	-	-	12	41,225.93
2009							
IST QTR	-	6	-	-	-	15	10,939.00
2ND QTR	-	20	-	-	-	17	24,865.42
3RD QTR	4	13	-	-	-	25	36.285.00
4™	1	3	-	-	-	25	12.463.84
TOT.	7	**113**	1	**565**	2	**143**	**151,857.22**

SOURCE: field work, 2021.