GUIDELINES FOR PROMOTING OCCUPATIONAL HEALTH AND SAFETY IN THE SMALL SCALE WOODWORKING INDUSTRY IN FAKO DIVISION OF CAMEROON

by

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Student number: 5729-154-3

DECLARATION

I declare that **GUIDELINES FOR PROMOTING OCCUPATIONAL HEALTH AND SAFETY IN THE SMALL SCALE WOODWORKING INDUSTRY IN FAKO DIVISION OF CAMEROON** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references and that this work has not been submitted before for any other degree at any other institution.

November 2017

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SIGNATURE **DATE**

Ayuk Betrand Tambe

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ABSTRACT

The International Labour Organization (ILO) estimates that more than 2.3 million workers die yearly from work related accidents and diseases and this is probably an underestimation. Estimates indicate that occupational accidents are a serious problem in the world. The aim of this study is to investigate the nature and magnitude of health and safety challenges affecting workers in small-scale and informal woodworking enterprises and to develop guidelines for improvement.

As a quantitative research, the exploratory-descriptive and contextual designs were used to conduct this research. Snowball sampling was used to collect data from all the 223 workers working in 88 small-scale and informal wood processing industries in Tiko, Mutengene, Buea, Ekona, and Muyuka areas from July 4th to 30th, 2016, using a structured interview and an inspection checklist. Data entry and cleaning was done using excel and exported to Statistical Package for the Social Sciences (SPSS) 20.0 for analyses.

The findings revealed that a majority of the woodworkers were males, young and inexperienced, mainly trained through apprenticeship and worked for long hours. There was generally lack of knowledge and poor practices of occupational health and safety among respondents. The findings also showed a very high self-reported injury rate of 86.1% among woodworkers within the past 12 months which was significantly associated ($P<0.05$) with woodworkers' age and practice of OHS. Major occupational injuries reported by the respondents include cut, sprain, backache, chronic joint, fracture

of the upper and lower limbs and burns. The major sources of injuries included carelessness, insufficient use of PPE and fatigue caused by overworking.

Further findings showed that most study sites did not comply with the Cameroon OHS Order No. 039/MTPS/IMT of 26 August 1984 as over half of the study's workshops had narrow walkways with obstacle and were situated in dilapidated structures. Most workers were exposed to high vibration and noise, excessive heat and cold, hazardous chemicals and ergonomic hazards.

The study thus recommends that effective measures be put in place to curb work-related injury rate by enhancing health and safety promotion programmes with emphasis on pre-employment OHS training for newly recruited workers, respect the 8 hours per day allocated for work, provide workers with suitable PPE, as well as other accompanying supplies such as appropriate fire extinguishers and first aids.

Keywords:

Cameroon; Fako division; guidelines; occupational health and safety; small-scale; woodworking industry.

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Dedication

I dedicate this study to my adopted grandmother, Nchenge Esther Enow, who made selfless sacrifices for me to be educated and encouraged me to pursue my dream.

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LIST OF ABBREVIATIONS

dB	Decibel
GDP	Gross Domestic Product
FAO	Food and Agricultural Organisation.
HIRA	Hazard Identification and Risk Assessment
IAPA	Industrial Accident Prevention Association
ILO	International Labour Organization
ISO	International Organization for Standardization
ITTO	International Tropical Timber Organization
MEK	Methyl ethyl ketone
MIBK	Methyl isobutyl ketone
MSDs	Musculo-skeletal disorders
OHS	Occupational Health and Safety
PEFR	Peak expiratory flow rate
PPE	Personal Protective Equipment
RTW	Return-to-work
SMEs	Small and medium-sized enterprises
SPSS	Statistical Package for the Social Sciences
UNISA	University of South Africa
WHO	World Health Organization
WHOHWFM	World Health Organization Healthy Workplace Framework and Model

CHAPTER 1

ORIENTATION TO THE STUDY

1.1 INTRODUCTION

The International Labour Organization (ILO) estimates that more than 2.3 million workers die yearly from work related accidents and diseases and this is probably an underestimation (Takala, Paivi, Kaija, Loke, Manickam, Tan, Peggy, Tjong, Lim, Lim & Gan 2014:329). Estimates indicate that occupational accidents are a serious problem in the world.

It is estimated that 72% of non-agriculture-related employment in Sub-Saharan Africa including Cameroon is made of small scale enterprises and the informal sector, employing the majority of the workforce, making this sub-region a leader in the growing global trend towards the informalisation of labour (ILO 2009a:1). According to research findings, there is a tendency for small and medium-sized workplaces to have worse safety records than large ones and the rate of fatal and serious injuries in small workplaces is also higher (Alli 2008:6; ILO 2009a:14). In addition, the accident rate amongst small contract (part-time) workers is, on average, 65% more than those of permanent workers (European Agency for Safety and Health at Work 2001:6).

Wood processing in Cameroon is a major economic activity, mainly carried out by two sectors existing side by side: the large-scale wood enterprises that are well connected to international markets and the small and medium-sized enterprises (SMEs), which, working with rudimentary facilities, strive to provide finished products to the local market. The latter are mostly informal, have limited technical and financial means, little training and rudimentary infrastructure (International Tropical Timber Organization (ITTO) 2014:9, International Association Technical Tropical Wood (ATIBT), Food and Agricultural Organization (FAO), ITTO 2013:11). An economic study conducted in 2006 among the working population estimated the manpower engaged in the timber industry in Cameroon at 16 000; and if the domestic wood sector is included, total forest-based employment is estimated at 45 000 (ITTO 2014:9). A significant portion of the workforce in the wood processing sector in Cameroon operates as small and informal businesses

where health and safety practices may not be known and the nature and extent of workplace exposures including work-related injuries and diseases have not been investigated.

1.2 BACKGROUND

Fako division is located in the coastal timber-producing area of Cameroon. It is one of six divisions that make up the South West Region of Cameroon and consists of six administrative units: Buea, Limbe, Tiko, Muyuka and Idenau. The largest concentration of woodshops are in Muyuka, Buea and Tiko due to its dense human population, the availability of Timber as well as the current high demand for wood products in the booming building construction industry. This has led to a high concentration of woodworking activities in the Fako division study area undertaken by small scale and informal enterprises predominantly owned by private sector individuals. These consist of fewer than 25 workers with owners often workers themselves and providing entry to the world of woodwork for young people and redundant workers. The precise number of these small businesses is unknown as no official statistics are available.

Major wood processing activities include: carpentry (manufacturing household and office furniture such as beds, tables, chairs, bookshelves, cabinets, desks, counters, lockers etc.), small saw and moulding mills (producing sawn wood, veneering, sliced wood and plywood, serving the lucrative building construction industry and woodworking for upholstery, etc).

The equipment used in wood processing activities are mainly artisanal; carried out with chainsaws or mobile saws, planning, sawing, spinning, sandpaper bandsaw, compressor, cutting machines etc. and thus requiring very little investment. The majority of these machines and equipment used during these activities are mostly second-handed and worn-out machines imported from Europe and America due to their low costs. These machines are mostly coupled and repaired by enterprise owners themselves when installed in their workshops. Some synthetic chemicals and products such as maxine, xylene, diluant, vanish, painting oil mastic, methyl ethyl ketone (MEK), toluene, methyl isobutyl ketone (MIBK), methanol etc. are most common chemicals used by workers in the research site during woodworking either to preserve the wood or improve on the quality of the finished product.

1.2.1 Global perspective of working conditions in small scale and informal enterprises

Woodworkers in small and medium-sized workplaces, who represent a substantial portion of the active population of the division, are a significant part of the workforce employed in tough and sometimes tedious and poorly paid jobs. There exists chosen industrial zones for some towns in the study area, for example, Buea, for these enterprises to be run but implementation is poor. Thus, they are openly run on public place and residential premises. Hence the nature and extent of their workplace exposures, work-related injury and disease rates are not known. The woodworking activities are male-dominated while the extent of involvement of women in recent times is not known and needs to be investigated.

The nature of the work done by workers in woodshops and the types of equipment and materials they handle present many on-the-job hazards. Accidents and injuries are mostly caused by rotating devices, cutting or shearing blades, wood handling and vehicle accidents while crushed hands, severed fingers, amputations, and blindness are some typical woodworking accidents (Boy 2007:20; Colman et al 2007:46). Other common injuries in woodworking include falling from a height, heavy lifting or repetitive movements, twisting or reaching, and breathing in noxious or toxic chemicals while working for increase productivity. In addition, workers are exposed to unfavourable weather conditions such as excessive heat from the sun and extreme cold during prolonged periods of rain and excessive noise that can impair hearing (Judd & Wiedenbeck 2004:15).

1.2.2 Environmental impacts of pollution on families and neighbours

Environmental impacts of pollution on families and neighbours are high. Since many SMEs are carried out in or near the home, they often expose family members and neighbours to the physical and chemical hazards of their workplaces and present public health problems through contamination of air or water or of food grown near the premises (Work Bank Group 2007:10). However, little is known about the precise nature of these conditions and the extent to which they affect the health and safety of informal workers in the woodworking industry in the study area.

1.2.3 Background to the research problem

Despite their contribution to the economy, operations of small woodworking enterprises are generally associated with high levels of occupational injuries and illnesses (ILO 2009b:14). The provision of occupational health and safety (OHS) is difficult because the workers of these enterprises are themselves mostly owners, including their relatives and friends, who have limited power to exert pressure for safe and healthy workplaces. Furthermore, the majority of the workforce in the informal sector do not work on contractual basis, so vital aspects such as social security rights are completely discarded by the owners of these businesses (Kijem 2009:22). Workers do not have access to mandatory health services provided by employers affiliated with the National Social Insurance Fund and this mounts significant pressure on public primary health care services. This situation flouts the provision of the Cameroon Labour code (Law No. 92/007 of 1992, as amended) that stipulates in section 98 that an "enterprise and establishment of any kind shall provide medical and health services for their employees".

A number of studies have investigated the OHS challenges faced by both large and small-medium sized wood enterprises in a few African countries including Libreville (Gabon), Mutare (Zimbabwe), Ile-Ife and South Western (Nigeria), Tamale Metropolis (Ghana) (Bello & Mijinyawa 2010:1-11; Colman et al 2007:44-46; Olawuni & Okunola 2014:167-176; Ochire-Boadu, Kusi, E & Lawer 2014:234-236; Steven 2012:278-285) but little is known about the situation in Cameroon, where the wood industry is a major economic sector. In addition, there is a need to characterise the small businesses involved in commercial woodworking where OHS risks are high. At the moment, no study has been conducted on woodworkers to estimate the injury rates neither in the large nor small scale wood industries in Cameroon. Thus, this study was the first study to make known injury rates in small-scale and informal wood processing industry in Cameroon.

1.3 PROBLEM STATEMENT

The small-scale woodwork sector is hazardous and has potential risks of exposures to hazardous substances. Research findings conducted in Nigeria revealed that many small woodworking enterprises operate in unsuitable workplaces and poor

environmental conditions often with no distinction of home and working place; thus predisposing workers as well as neighbouring communities to potential risk of injuries and diseases (Bello & Mijinyawa 2010:8; Judd & Wiedenbeck 2004:15).

Vital information needed to take remedial action is lacking. The very nature of the informal economy makes it almost impossible for governments to collect essential statistics needed to take appropriate corrective action, and, since most small scale woodworking in Cameroon takes place in homes, public places, streets, open air, un-safe work and unhealthy places, they lack basic health and welfare services and social protection. The latter makes it very difficult for inspectorates to inspect and investigate working conditions or get information and advice to the people who need it (Alli 2008:7). The absence of records or reporting systems renders the task of assessing the magnitude of occupational injuries and diseases among woodworkers difficult. Such data could have been of very importance in the recognition, prevention and control of occupational health risks to improve workplace conditions.

Furthermore, many of the small-scale woodworking enterprises operate in dilapidated structures, lack sanitary facilities or potable water, and have poor waste disposals. Woodworking by nature generates a lot of waste-sawdust and in the absence of a proper disposal method, the waste is burnt in open air (air pollution) and this certainly constitute a health hazard to the population around that particular area (Olawuni & Okunola 2014:168). Woodworking activities generate toxic substances that are transported to considerable distances away from source and become accumulated in soils, and water body as well as causing physical damage to structures such as cracks on the wall and deterioration of building. The distinction between working and living conditions often becomes indistinct, and both are related to broader problems of poverty and under-development. The interaction between occupational hazards and poor living conditions can exacerbate the health problems of informal wood sector workers.

Steven (2012:280) investigated health and safety problems among workers processing wood in Mutare, Zimbabwe and found that owners' and managers' knowledge of health and safety shaped their attitudes towards safety as well as their health and safety practices. For example, owners and managers at the plant did not perceive safety as a priority and hence provided only limited personal protected equipment (PPE). Consequently, workers do not link safety of work equipment and workplace conditions

to their health and wellbeing. The aim of this study will be to investigate association between these risk factors and injury and illness rates. Many employers in the informal sector believe that by subcontracting certain tasks, they subcontract their safety responsibilities (Alli 2008:8). Hence, more information is needed on their understanding and practices of health and safety in order to develop measures for improvement.

Another study conducted in Western Nigeria has also shown that small scale woodworkers start business with no knowledge of occupational health and safety and had not at any time during employment attended any safety training. The knowledge acquired is based on the apprenticeship training and experience gathered on the job. Thus, many come into the sector as traders and not as a trained wood worker with requisite professional knowledge. This exposes them to some untold levels of hazards (Bello & Mijinyawa 2010:6). This may mean that there is little or no training in Occupational Health and safety; there may be no enforcement visits too that can raise awareness. These require more detailed investigations particularly in Cameroon where there has been no study conducted to investigate these issues.

The use of obsolete machines is the major risk factor in small scale enterprises. Bello and Mijinyawa (2010:6) reported that major risk factors easily noticeable in most of the wood processing are the age factor of the machine and equipment in use. Most of the machines are outdated with most of the safety guards removed or non-functional and can cause serious injuries. Occupational health and safety in the woodworking enterprises is less catered for among woodworkers.

A study carried out in Kumasi, Ghana among woodworkers showed that wood enterprises do not comply with occupational health and safety legislation/practices (Kwankye 2012:54). The level of knowledge of OHS and workplace practices among small and informal woodworkers are even less known in Cameroon where no study has been conducted. But these are important when planning and implementing training interventions in health and safety to improve workplace conditions. It is also worth noting that Cameroon like many other Sub-Saharan African Countries has a lot of unemployed graduates from universities and technical schools. Little is known about the categories that seek self-employment in this industry, particularly women, and their knowledge and practice of health and safety at work.

A recent study in Tamale, Ghana found that the majority of woodworkers have about 10 years of formal education and workers who have little or no formal education acquire their skills and expertise on the job through substantial years of work experience (Ochire-Boadu et al 2014:235). According to these researchers, workers lack the professional safety approach to their work. And their owners/managers may have had little training in operation and management and even less in the recognition, prevention and control of occupational health and safety risks. Even where appropriate educational resources are made available, they often lack the time, energy and financial resources to make use of them. The situation in Cameroon is less clear and needs more research to identify the gaps and plan for appropriate interventions.

Little is known about the setting in Cameroon involving mainly small and informal woodworking businesses. It is therefore necessary to investigate their awareness of occupational health and safety, and their practices in the implementation of OHS prescriptions.

1.4 AIM

Based on the research problem, this study set out to investigate the nature and magnitude of health and safety challenges affecting workers in small-scale and informal woodworking enterprises and propose measures for improvement. This is vital in that it will ensure/promote the health and safety of workers in the targeted sector as well as that of those in nearby communities affected by their operations and hopefully reduce the rate of injuries among woodworkers.

1.5 OBJECTIVES

The objectives of the research were to:

- Determine the socio-demographic and economic characteristics of small scale and informal woodworkers in the Fako division of Cameroon.
- Investigate the knowledge and practices of occupational health and safety among small scale and informal wood workers in the Fako division of Cameroon.
- Assess the nature and magnitude of work-related injuries and diseases.

- Inspect the occupational health and safety working conditions of small scale and informal wood workers in the Fako division of Cameroon.
- Explore the relationship between socio-demographic characteristics, nature of working conditions, nature and magnitude of work-related injuries and diseases and Knowledge and practice of OHS.

1.6 RESEARCH HYPOTHESIS

The researcher hypothesises that small-scale and informal woodworking enterprises in Cameroon face numerous occupational health and safety challenges that have not been studied to update the current OHS policies.

1.7 SIGNIFICANCE OF THE STUDY

It is envisaged that the results of this research would provide baseline data for small-scale and informal woodworking enterprises in Cameroon which is currently lacking. Although several research studies have been carried out in the field of occupational health and safety, a gap still exists in the informal woodworking sector as it has been neglected.

Furthermore, this study would help identify major risk factors in informal woodworking workplaces and pave possible paths for future research opportunities as well as individual study appropriate for such opportunities in other workplaces. It also considers some key issues with relevant work-related literature that serve as a resource and means of information exchange through which practitioners, professionals and others can benefit from the case studies included in this work.

Furthermore, the findings which were elicited from a structured questionnaire and interviews would provide organisations, work place health researchers and safety advocacy groups such as trade unions, with information to be used in designing programmes to educate and sensitise woodworkers on safety regulations to mitigate the persistence of fatalities and injuries.

1.8 DEFINITIONS OF KEY CONCEPTS

1.8.1 Informal sector

The informal sector consists of units that are unincorporated (i.e., not constituted as separate legal entities of their owners), produce goods or services for sale or barter, and satisfy a number of criteria; for example, they are unregistered, small, have unregistered employees and/or they do not maintain a complete set of accounts (ILO 2011:12). In this study, Informal sector refers to small woodshops operating without registered licenses for their woodshops (illegal), with either one or few employed workers.

1.8.2 Occupational accident

It is an unexpected and unplanned occurrence, including acts of violence, arising out of or in connection with work which results in one or more workers incurring a personal injury, disease or death (Taswell & Wingfield-Digby 2008:18). In this study, Occupational accidents cover all accidents causing injury, death or diseases emanating from the workplace/woodshops or elsewhere, while the woodworker is carrying out the business of the employer.

1.8.3 Occupational disease

It is defined as a disease contracted as a result of an exposure to risk factors arising from work activity (ILO 1996:3). For the purpose of this study, occupational diseases are those contracted as a result of working in woodshops or issuing from woodwork activities.

1.8.4 Occupational health

Occupational health is considered a multidisciplinary activity which is concerned with the

- protection and promotion of the health of workers by preventing and controlling occupational diseases and accidents and by eliminating occupational factors and conditions hazardous to health and safety at work
- development and promotion of healthy and safe work, work environments and work organisations
- enhancement of physical, mental and social well-being of workers and support for the development and maintenance of their working capacity, as well as professional and social development at work
- enablement of workers to conduct socially and economically productive lives and to contribute positively to sustainable development (Takele & Mengesha 2006:4; WHO 2001:14)

In the present study, occupational health is the development, promotion, and maintenance of workplace/woodshop policies and programs that ensure the physical, mental, and emotional well-being of woodworkers in Fako division.

1.8.5 Occupational injury

It is any personal injury, disease or death resulting from an occupational accident; an occupational injury is therefore distinct from an occupational disease, which is contracted as a result of an exposure over a period of time to risk factors arising from work activity (Taswell & Wingfield-Digby 2008:20). In this study, it is death, any personal injury or disease suffered by a woodworker in Fako division as a result of an occupational accident.

1.8.6 Occupational safety

The maintenance of a work environment that is relatively free from actual or potential hazards that can injure employees (Industrial Accident Prevention Association 2007:20). In this study, it is the protection of a woodworking setting to be free from possible dangers that can harm woodworkers in Fako division.

1.8.7 Risk

This refers to the probability of a worker suffering from an injury or health problem, or of damage occurring to property or the environment as a result of exposure to or contact with a hazard (IAPA 2007:20). In this study, a risk is any condition that exposes a woodworker to possible danger or health problem in Fako division.

1.8.8 Small-scale enterprise

There is no single universally accepted definition of what comprises a small-scale enterprise. A difference is generally made between very small cottage activities characterised by household location and traditional artisanal techniques and somewhat larger workshop enterprises employing some modern techniques. Most common, and used in this research, is the definition by a number of employees. In some countries, enterprises with up to 250 employees are classed SSE, but in Cameroon, enterprises employing up to 50 employees are defined as SSE. In practice however, most Small-scale Enterprises in Cameroon which have between one and twenty workers are distinguished from formal by virtue of registration of the enterprise with the government. This definition was adopted in this study. To this effect, all woodshops with these criteria were included in the study.

1.8.9 Woodwork industry

There is no clear definition for woodwork industry. Most authors will rather prefer to define the concepts separately. Woodwork is the act, art or trade of working with wood and an industry is a business activity, which is related to the raising, producing, processing or manufacturing of products (Osita 2013:100). In this study, woodwork industry is a business activity involved in the act, art or trade of working with wood, irrespective of its legal status in Fako division.

1.8.10 Work environment

The work environment can be thought of, simply, as the environment in which people work. As such, it is a very broad category that encompasses the physical setting (e.g. heat, equipment), characteristics of the job itself (e.g. workload, task complexity),

broader organisational features (e.g. culture, history) and even aspects of the extra-organisational setting e.g. local labour market conditions, informal sector, work-home relationships (Briner 2000:299). In this study, it is the characteristics of the woodworking environment in which a woodworker in Fako division is expected to work. This includes physical and social environmental conditions and benefits.

1.8.11 Worker

A worker refers to any person who performs work, either regularly or temporarily, for an employer (ILO 1996:4). For the purpose of this study, workers refer to all persons regardless of the sex working in wood workshops in Fako division. They were referred to as woodworkers.

1.8.12 Workplace

Any place in, on or near to where a worker works. A workplace could be a building, a woodshop, a construction site an open field, a road, a forest, a vehicle or even a beach (Occupational Health and Safety Act 2015:8). In this study workplace refers to the wood workshops where this woodworkers carry out their activities such as wood planning, sawing, spinning, sandpapering, furniture making etc.

1.9 THEORETICAL FRAMEWORK

This research study was guided by World Health Organization Framework and Model (Burton 2010:82). The WHO framework and model include both content and process, and may be implemented by any workplace of any size, in any country. There is no “one-size-fits-all” and each enterprise must adapt these recommendations to their own workplace, their own culture and their own country. The ability of any enterprise to implement the healthy workplace model proposed below was influenced by the legislative, policy and regulatory situation in their country. The informal sector also presents challenges for creating healthy workplaces because of its uncertainty and precarious nature of the work. Notwithstanding, employers who wish to create a healthy and safe workplace for the informal workers should modify the WHO framework and model to suit the situation as described below (Burton 2010:82).

1.9.1 Avenues of influence for a healthy workplace

To establish a workplace that protects promotes and supports the complete physical, mental and social well-being of workers, an enterprise should reflect on addressing content in four "avenues of influence", based on identified needs. These are four ways that an employer working in collaboration with employees can influence the health status of not only the workers but also the enterprise as a whole, in terms of its efficiency, productivity and competitiveness. They include: the physical work environment, the psychosocial work environment, personal health resources in the workplace and enterprise community. These four areas relate to the *content* of a healthy workplace programme, not the *process*. As such, the four avenues intersect and overlap with one another. Hence, they are graphically represented as four overlapping circles, as shown in figure 1.1.

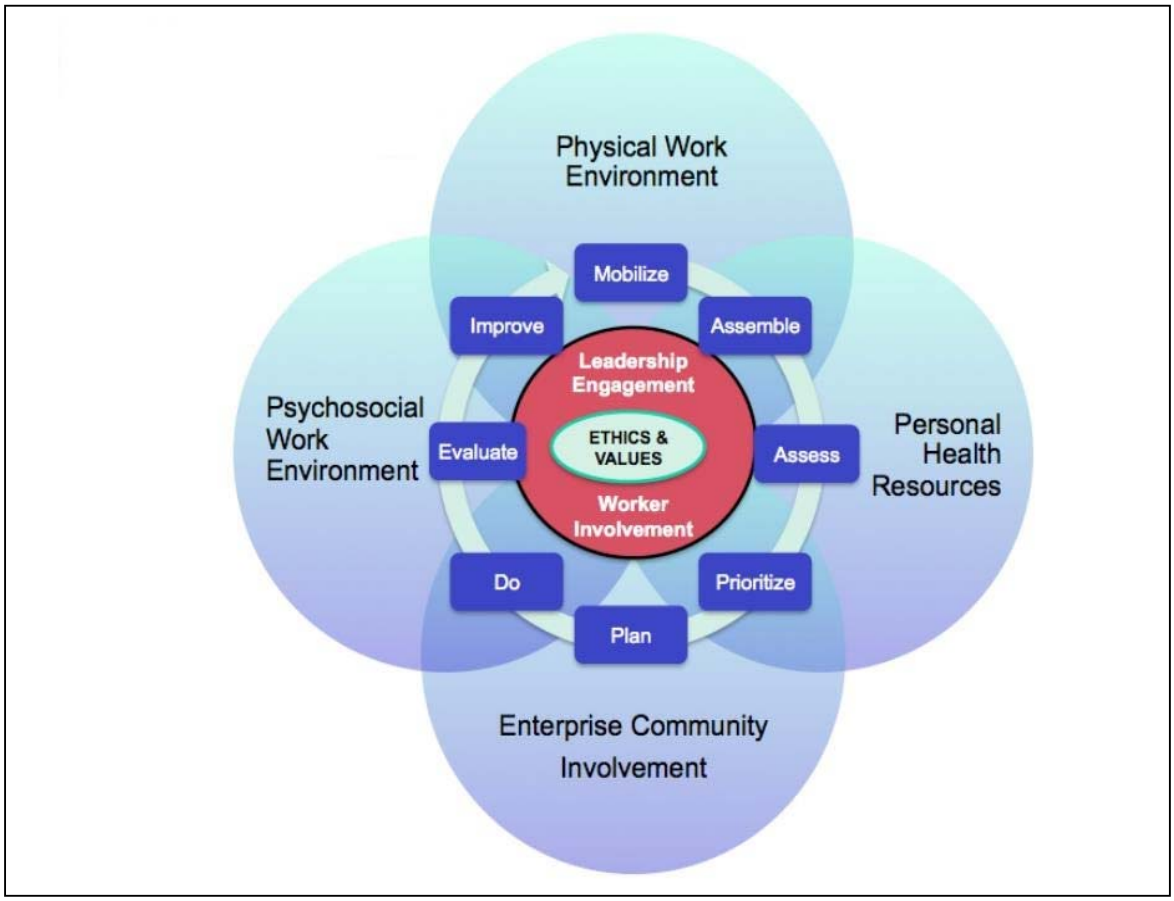

Figure 1.1 WHO Healthy and Workplace Model: Avenues of influence and process and core principle

(Burton 2010:3)

1.10 CONCEPTUAL FRAMEWORK

A healthy workplace is “one in which workers and managers collaborate to use a continual improvement process to protect and promote the health, safety and wellbeing of all workers and the sustainability of the workplace by considering the four avenues, based on identified needs.

1.10.1 Physical work environment

It is the part of the workplace facility that can be detected by human or electronic senses, including the structure, air, machines, furniture, products, chemicals, materials and processes that are present or that occur in the workplace, and which can affect the physical or mental safety, health and well-being of workers. If the worker performs his or her tasks outdoors or indoors then that location is the physical work environment. Many hazards in the physical work environment would fall into physical hazards, biological hazards, and chemical hazards (Burton 2010:84).

1.10.2 Psychosocial work environment

It includes the organisation of work and the workplace culture; the attitudes, values, beliefs and practices that are experienced on a daily basis in the enterprise such as woodshops, and which influence the mental and physical well-being of workers (Burton 2010:85). These are sometimes generally referred to as workplace stressors, which may cause emotional or mental stress to workers. Some psychosocial hazards that exist in literature includes poor work organisation, poor workplace culture, issues of shift work, no support and/or protection of workers' rights and so on (Burton 2010:85).

1.10.3 Personal health resources in the workplace

It refers to the supportive environment, health services, information, resources, opportunities and flexibility an enterprise provides to workers to support or motivate their efforts to improve or maintain healthy personal lifestyle practices, as well as to monitor and support their ongoing physical and mental health (Burton 2010:86). This avenue of influence is perhaps the most difficult to apply to workers in the informal sector, since generally any existing benefits, programmes and policies do not apply to them.

However, a motivated employer can choose to unofficially extend benefits, services and flexibility in scheduling to informal workers, and provide health education information to informal workers (Burton 2010:86).

1.10.4 Enterprise community involvement

It comprises the activities, expertise, and other resources an enterprise engages in or provides to the social and physical community or communities in which it operates; and which affects the physical and mental health, safety and well-being of workers and their families. It includes not only activities, expertise and resources provided to the immediate local environment, but also the broader global environment (Burton 2010:87). In a developing nation, in the absence of accessible health care or enforcement of labour laws, the activities of the enterprise in the community may make a world of difference to the quality of life of employees and their families (Burton 2010:87).

1.11 RESEARCH DESIGN AND METHODOLOGY

1.11.1 Research design

The research design used was quantitative; analytical and contextual designs were used given the objective to explore the nature and magnitude of OHS challenges, and to identify risk factors associated with self-reported injury and illness rates among woodworkers in Fako division. A structured interview and a checklist were the two types of structured data collection methods used to collect and record data from respondents. While the structured interview data collecting tool was used to conduct workplace interviews by directly interviewing the woodworkers from identified woodshops, the designed checklist was used to conduct environmental surveys/inspections of the working conditions in the study sites to ascertain if they met the minimum OHS standards. This has been elaborated in chapter 4.

1.11.2 Study site

The research was conducted in the five (Tiko, Mutengene, Buea, Ekona and Muyuka) major towns of Fako division in the South West Region of Cameroon where over 80% of the small-scale processing enterprises in this location deal with wood, re-sawing or

furniture making or integrated wood activities. This area has also been selected for the study because no previous study has been carried out here to find out the challenges faced by woodworkers in small scale and informal woodworking. The Division is experiencing increases in human population and construction activities, which all tend to affect the woodworking activities and its workers' safety. Further details on the research setting are discussed in chapter 4 of this research work.

1.11.3 Research population

The population of a study refers to all the elements, including individuals, objects or substances that meet the criteria for inclusion in a given universe (Burns & Grove 2009:714). Thus, the target population for this study were woodworkers working in the small-scale and informal enterprises in Fako division of Cameroon. It has a current population of 444,269 inhabitants and a density of 216 persons per square kilometre (Orock & Lambi 2014:41). The concept of the research population has been explained further in chapter 4 of this research work.

1.11.4 Sample and sampling

A sample is a collection of some elements of a population. Burns and Grove (2009:343) defined sampling as the process of selecting a proportion of the target population to represent the entire population. For respondents to be recruited in the present study, the respondent had to be a woodworker and working in a small scale or informal enterprises, and also willing to participate. Snowball sampling was used to get respondents from the informal small-scale wood processing industries in Fako area in Cameroon. In this case, referrals was asked from already identified small and informal woodshops workers given the lack of database as most of them are presumably unregistered.

The sampling strategy was in two stages. First, the sites were identified and from them respondents were recruited. All the workers present at the site during the research were recruited given the small number of workers in the targeted sector.

1.11.5 Data collection

According to Creswell (2015:9), data collection is the identification and selection of individuals for a study, obtaining permission from them, and gathering information by asking people questions or observing their behaviours. The present study made use of a structure questionnaire and a checklist to collect and record data from respondents. The researcher held face-to-face interviews with the workers at their woodshops with the help of structured interview questions and a checklist was used to conduct the environmental survey/inspection of the working conditions in the study sites to ascertain if they meet the minimum OHS standards. The interview questions and the checklist were developed as separate data collection tools in the structured questionnaire.

On the front page of the structured questionnaire was the respondents' informed consent letter (Annexure D), which carried the aim of the research, and ethical aspects of confidentiality and anonymity. The interviewer-administered questionnaire comprised mainly close-ended questions. An inspection checklist was used to assess environmental conditions and facilities at the study sites.

The interviewer-administered questionnaire comprised of three sub-sections (Annexure B):

- Socio-demographic and economic characteristics
- Knowledge and safety practices of health and safety
- Nature and magnitude of work-related injuries and diseases

The checklist was also used for inspections of the working conditions in small scale wood enterprises. The overall compliance with OHS control measures was scored using the ratings from observations and inspection of the relevant documents and indicated by means of *"Yes or No".*

The checklist was divided into seven sections, namely:

(i) Workplace conditions
(ii) Occupational health and safety training

(iii) Personal protective equipment provision
(iii) The state of work equipment and maintenance
(iv) Housekeeping aspects
(v) Health and safety hazards

The questionnaire also contained a letter to the management of the woodshop to request formal permission from the management of woodshops (Annexure E).

The questionnaire was originally developed in English language and translated into French language and thereafter we translated back to English in preparation for analysis. To ensure the validity and reliability of data, the data collection tool was an interviewer-administered questionnaire, wherein the researcher completed it on behalf of workers/respondents. The feedback/comments gathered from data collected were used to refine the data collection tools. All research assistants recruited to take part in this research had at least a bachelor's degree and had experience on quantitative data collection and were fluent in English, Pidgin English and French languages, which are the languages spoken in the study sites. We spent almost 30 minutes on each respondent to conduct the interview and we did not audio/video tape.

1.11.6 Pilot study

In order to check the questionnaire for its general content, content validity and thoroughness, a pilot study was carried out. The remarkable advice and comments got from the pilot study were then incorporated in the final survey instrument. Thus, ensures errors to be corrected at little cost.

The present research pre-tested the questionnaire on twelve respondents recruited from three workshops who met the selection criteria and conducted at their respective workplaces in Mfoundi Division located in the Centre Region of Cameroon. This was not to reduce the number of respondents given that they were not many respondents in the area of interest. During the exercise attention was also given to body language and non-verbal responses as well as the manner of asking questions. This improved the researcher's level of confidence and thus authentic data collection. Since the researcher worked with six other experienced research assistants, the researcher used the pilot

study as a medium to improve their interviewing experience as well as their interpersonal skills.

1.11.7 Data collection process

Data were collected from all small scale and informal wood locations in Tiko, Mutengene, Buea, Ekona, and Muyuka towns in July 2016 by the supervisor of the main researcher and with the help of two research assistants. Data collection was done using interviewing schedules through woodshop-to-woodshop visits by the research team. The questionnaires were again cross-checked at the end of the day to ensure that all necessary information was correctly collected by the researcher.

1.11.8 Data analysis

Quantitative data analysis began with editing and coding of all responses to the questions of the structured interview. Data entry and cleaning was done using excel and exported to Statistical Package for the Social Science 17.0 (SPSS) Windows Version by CDC Atlanta, Georgia, USA and Epi Info version 3.5.3 for analysis.

Descriptive statistics were used to summarise Respondents' demographics and other categorical data such as means (standard deviation) for continuous variables, and percentages for categorical variables. An annual incidence rate was estimated to facilitate international comparability.

Bivariate analyses were also done to determine strength of association of determinant factors. Knowledge and practice was assessed using the odds ratio with a 95% confidence interval (CI). Variables which were significant at p-value <0.05 and 95% CI were considered to be the occupational health and safety challenges faced by woodworkers. The data analysis is discussed in detail in chapter 3 of this thesis.

1.11.9 Ethical considerations

The involvement of human subjects in a study calls for complete and careful protection of their rights (Polit & Beck 2004:141).

1.11.9.1 Protecting the rights of respondents

Ethical principles assist researcher to identify and protect the interests of respondents in a research context and to promote development of high-quality knowledge that may likely benefit future generations. These principles include:

1.11.9.1.1 Informed consent

A letter of introduction was submitted and approved by the management of all the small-scale wood enterprises, requesting for permission to conduct the study. This letter carried the aim of the study thus enabling the enterprise to make an informed decision before signing of the consent form. Also, written permission or informed consent was also obtained from all woodworkers/respondents after satisfactory explanation of the nature of the study before the structured interview and checklist were administered.

1.11.9.1.2 Respect for persons (dignity and autonomy)

Respondents made an informed voluntary decision to participate in the research by signing the written consent form after satisfactory explanation of the information contents of the research and all their questions satisfactorily answered prior to the interview. The right of self-determination was respected at all times; all respondents were informed of their complete right to withdraw from the study at any time without any explanation, and without negative consequences.

1.11.9.1.3 Confidentiality and anonymity

Research respondents should have the right to remain anonymous and their confidentiality respected. No information that the respondent revealed was made public or available to others. Anonymity was obtained by omission of names on the questionnaires (Polit & Beck 2008:170). Thus, codes and not personally identifiable information were used in the event of a publication or presentation resulting from the research. That is, at the end of this research, the researcher could not link individuals with data provided. Also, the study was conducted in the respondents' natural setting; there was no violation of privacy with regard to information provided.

1.11.9.1.4 Right to privacy

The researcher made sure that when respondents described their challenges of being involved in small scale and informal woodworking, information given was not disclosed. The interviews were conducted in the privacy of the woodworkers' woodshops. In addition, the structured interview and checklist did not involve any form of audio/video tape-recording or mentioning of respondents' names.

1.11.9.1.5 Justice

Justice was ensured by recruiting all woodworkers working in small scale and informal enterprises present at the site during the study, thus giving each and every woodworker with this experience, the fair chance to participate in the study. Thus, selection of woodworkers was based entirely on woodworking experience at research sites. No woodworker was unfairly targeted or excluded unreasonably on the basis of any of the prohibited grounds for discrimination: race, age, sex, sexual orientation, disability, education, religious belief, pregnancy, marital status, ethnic or social origin, conscience, belief or language (South African Department of Health 2015:16).

1.11.9.1.6 Beneficence

Data was collected from woodworkers with no known risks which would expose them to harm. It did not involve specimen collection from any respondent, thus respondents were free from harm. Respondents were equally informed of no direct benefit but their participation was likely to help us find out more about how to improve occupational health and safety in their community.

1.11.9.1.7 Protecting the right of the institution

Ethical clearance certificate was obtained from the Research and Ethics Committee at the Department of Health Studies of the University of South Africa (Annexure A). The researcher presented the certificate of ethical clearance of UNISA to the South West Regional Delegation of Public Health to get administrative authorisation to collect data

in Cameroon (Annexure F). The permission to carry out the study in the enterprises was granted by the management of the enterprises (Annexure E).

1.11.9.1.8 Scientific integrity

Scientific integrity was maintained by providing references for all sources from which materials were exploited. The researcher used objective methods to collect, analyse and report the study findings. The researcher maintained honesty when writing and reporting the findings by properly explaining the methods used and the reasons for doing so. No distortion of data was done to fit what the researcher wanted to achieve and only what the data revealed was reported (Polit & Beck 2008:188; Saunders, Lewis & Thornhill 2009:199).

1.11.10 Validity and reliability of the data collection instruments

Validity and reliability are two important concepts in the acceptability of the use of an instrument for research purposes. In short, validity refers to the correctness of the instrument while reliability refers to its consistency in measuring whatever it is intended to measure. They should normally be established before the research (Amin 2005:284).

1.11.10.1 Validity of the research instrument

Validity refers to the degree to which a study accurately reflects or assesses the specific concept that the researcher is attempting to measure (Howell, Miller, Park, Sattler, Schack, Spery, Widhalm & Palmquist 2015:3). The study was based on an in-depth literature review to develop main concepts to be explored and operational definitions were used to clearly describe the variables of the study. Congruence was ensured between research questions, objectives, investigation, findings and recommendations.

1.11.10.1.1 Content validity

Content validity is based on the extent to which a measurement reflects the specific intended domain of content (Howell et al 2015:3). In our study, the data collection tool used was developed mainly by adapting from the questionnaires published in renowned journals and relevant studies. For example, our standardised checklist was adapted

from the International Labour Organization for conducting safety, health and working conditions inspections. The research instrument was reviewed by my supervisors and pre-tested for content validity Conclusions were not be drawn from data that had been collected with instruments not serving the purpose for which the instruments are intended.

1.11.10.2 Reliability of the research instrument

Reliability is the extent to which an experiment, test, or any measuring procedure yields the same result on repeated trials (Howell et al 2015:1). In the present research, structured interview questions were clearly worded and verified by the supervisors with the expectation of obtaining the same responses from all respondents. This was pre-tested if responses from respondents selected from different woodshops differ, using the same data collection tool. The feedback obtained from the results of the pre-test study was used to refine the questionnaire. The data collection tool comprised mostly of closed-ended questions to reduce the introduction of bias. Completed questionnaires were properly checked daily by the main researcher for completeness and consistency.

1.12 LIMITATIONS OF THE STUDY

Practically all research studies contain some imperfections (Babbie 2005:254). The findings of this study are limited to the woodworkers in small-scale and informal enterprises in Fako division, Cameroon. Recommendations based on these findings may not be applicable to other divisions in Cameroon and other countries.

1.13 OUTLINE OF THE STUDY

Chapter 1: Orientation to the study
Chapter 2: Discusses the literature review conducted for the study
Chapter 3: Theoretical framework of the research
Chapter 4: Methodology of the research
Chapter 5: Describes the data analysis and interpretation of findings
Chapter 6: Discussion on research findings
Chapter 7: Conclusions and recommendations
Chapter 8: Practical guidelines

1.14 CONCLUSION

This chapter has outlined the background to the research problem and problem statement, aim and objectives, definition of key terms used in the study, and research design and methodology.

The aim of this study was to investigate the nature and magnitude of health and safety challenges affecting workers in small-scale and informal woodworking enterprises and proposing measures for improvement in Fako division. It survey OHS health and safety challenges faced by workers in these workplaces. The next chapter focuses on the review of relevant literature.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents findings from literature relevant to this study. The chapter begins by presenting literature review findings relating to the description of the nature of small-scale and informal woodworking enterprise in Cameroon. Furthermore, findings on relevant Occupational Health and Safety (OHS) legislative framework for the small-scale and informal enterprises and compliance thereof both locally and internationally are presented. The chapter further discusses literature review findings relating to the demographic characteristics of workers in small-scale and informal enterprises, knowledge and practices of workers regarding OHS in small-scale and informal enterprises, the nature and magnitude of work-related injuries and diseases commonly reported by workers in small-scale and informal enterprises, as well as OHS status and conditions in small-scale and informal enterprises. The latter focuses on the types of exposures (hazards) and associated levels of risks. The preventive measures that can be used to minimise and control exposures to work in the small scale and informal setting have also been described.

2.2 METHODS

The review of literature was conducted using library and internet research that included books, scientific journal articles, published theses, newsletters, magazines, newspapers, conference proceedings, reports from Labour departments and the International Labour Office. The search engines used include Medline, Scopus, Google Scholar and PubMed, to name but these and keywords such as ooccupational health and safety, small-scale, knowledge and practice, woodworking industry were used to search relevant published literature. A combination of Cameroon or Sub-Saharan Africa and international literature were examined to gain an understanding of compliance with occupational health and safety legislation, standards and regulations as applicable in small-scale and informal sectors.

2.3 LITERATURE REVIEW FINDINGS RELATING TO THE DESCRIPTION OF THE NATURE OF SMALL-SCALE AND INFORMAL WOODWORKING ENTERPRISES IN CAMEROON

Wood processing is a major economic activity in Cameroon. Osita (2013:100) refers to woodwork as the act, art or trade of working with wood. Woodwork is mainly carried out by two sectors existing side-by-side: the large-scale wood enterprises that are well connected to international markets and, the small and medium-sized enterprises (SMEs), which, working with rudimentary facilities strive to provide finished products to the local market. The latter are mostly informal, have limited technical and financial means, little training and rudimentary infrastructure (ITTO 2014:9; International Association Technical Tropical Wood and Food and Agricultural Organization Forestry Department 2013:11). The large-scale wood industry has little interest in local markets, which are deemed unattractive, and the business climate is not favourable for investment. The contribution of the forest sector to GDP was about 320 billion FCFA (US$ 650 million) in 2004 (ITTO 2014:9). We found no literature on occupational health and safety challenges in small-scale and informal woodworking enterprises in Cameroon.

2.4 LEGISLATIVE FRAMEWORKS ON OCCUPATIONAL HEALTH AND SAFETY WITHIN LOCAL AND GLOBAL PERSPECTIVES

2.4.1 State conventions and international codes of practice in terms of the hierarchy of occupational health and safety (OHS) Law in Cameroon

This section provides a summary of international declarations and conventions that are applicable to occupational health and safety (OHS) in the woodworking sector. They include: “ILO convention on promotional framework for occupational safety and health (No 187)”, “ILO code of practice on safety and health in the use of machinery”, ILO Convention on the principles of Occupational Safety and Health (No. 155) and ILO Convention on the principles Occupational Health Services (No. 161). None of these four conventions has been ratified by Cameroon government. However, more than 40 standards and over 40 codes of practice mainly dealing with occupational safety and health at work have been adopted by ILO (Steven 2012:183).

2.4.1.1 International Labour Organization (ILO) Convention on Promotional Framework for Occupational Safety and Health (No. 187)

The ILO convention on promotional framework for occupational safety and health has as its goals to ensure member states' recognition, the promotion of occupational safety and health and decent work for all in national agenda, and to stress on the importance of the continuous promotion of a national preventative, safety and health culture (ILO 2006:5). Article 3 of the convention states that each member which ratifies this Convention shall take active steps towards progressively achieving a safer and healthier working environment through national programmes on OSH by taking into account the principles in relevant ILO instruments on occupational safety and health (ILO 2006:6). The national programmes contribute to the protection of workers by minimising work-related hazards and risks, in accordance with national law and practice, in order to reduce work-related deaths, injuries and diseases (ILO 2006:7). Mechanisms should be implemented to progressively improve OHS conditions in micro-, small and medium-sized enterprises. Also, the states should progressively develop and periodically review a national system for OHS, in consultation with representative organisations of employers and workers.

2.4.1.2 International Labour Organization (ILO) code of practice on safety and health in the use of machinery

The objective of this code is firstly, to protect workers from the hazards of machinery and to prevent accidents, incidents and ill health resulting from the use of machinery at work by providing guidelines for ensuring that all machinery for use at work are designed and manufactured to eliminate or minimise the hazards associated with its use (ILO 2013a:7). Secondly, the guidelines ensure that employers are provided with a mechanism for obtaining from their suppliers, necessary and sufficient safety information about machinery to enable them implement effective protective measures for workers. Thirdly, ensuring that proper workplace safety and health measures are implemented to identify, eliminate, prevent and control risks arising from the use of machinery (ILO 2013a:7). The code also provides the technical requirements and defined measures that should be taken into consideration to protect workers' safety and health such as control systems, machinery guarding and protection against mechanical

and other hazards, information, including marking and supplementary measures relating to specific machinery types (ILO 2013a:8).

Therefore, the appropriate sections of this code should be used by manufacturers and suppliers to ensure that the design and construction of machinery are safe for use and fit the purpose for which they are intended. The code should also be used by the employers to assess whether the machinery they select and use or modify are fit for purpose and suitable for the specific working environment and conditions (ILO 2013b:2).

2.4.1.3 International Labour Organization (ILO) convention on the principles of Occupational Safety and Health (No. 155)

The aim of this convention is to provide the fundamental principles of national OHS. It requires formulation, implementation and periodic review of a coherent national policy on occupational safety, occupational health and the working environment in consultation with most representative organisations of employers and workers (ILO 1981:2). This policy helps to prevent work-related accidents and injury by minimising the causes of hazards inherent in the working environment (ILO 1981:2). This convention also indicate the respective functions and responsibilities in respect of occupational safety and health and the working environment of public authorities, employers, workers and others, taking account both of the complementary character of such responsibilities and of national conditions and practice. In addition, adequate and appropriate system of inspection should be conducted to ensure the enforcement of laws and regulations concerning occupational safety and health and the working environment. The enforcement system should provide for adequate penalties for violations of the laws and regulations. Measures shall be taken to provide guidance to employers and workers so as to help them to comply with legal obligations. Also, employers should ensure that the workplaces, machinery, equipment and processes under their control are safe and without risk to health (ILO 1981:6).

2.4.1.4 International Labour Organization (ILO) convention on the principles Occupational Health Services (No. 161)

ILO convention on the principles occupational health services has as the aim to establish and maintain a safe and healthy working environment which will facilitate

optimal physical and mental health in relation to work. It also promotes the adaptation of work to the capabilities of workers in the light of their state of physical and mental health in all sectors of the economy (ILO 1985:1). The occupational health services should be implemented in consultation with most representative organisations of employers and workers. This convention recommends that each member state ratifying it must formulate, implement and periodically review a coherent national policy on occupational health services (ILO 1985:2). The employers are responsible for the health and safety of their workers and it is of paramount importance for the workers to participate in matters of occupational health and safety that concerns them. Provision should be made by either by law or regulations, collective agreements or in any other manner approved by the competent authority after consultation with the representative organisations of employers and workers concerned for the establishment of occupational health services. In accordance with national law and practice, occupational health services should be multidisciplinary and the composition of the personnel shall be determined by the nature of the duties to be performed (ILO 1985:4).

2.5 THE CAMEROONIAN PERSPECTIVE

This section provides an outline of Cameroonian legislation applicable to occupational health and safety issues affecting workers across industries and including the small scale woodworking industries.

Cameroon OHS law consists of Laws (Lois), Decrees (Decrets) and Orders (Arretes). They include; Law N 68-LF-18 of Nov 1968, Law N 77-11 of 13 July 1977, Law No. 92/007 of 14 August 1992, decree N 61-159 of 13 September 1961, decree N 69-DF-179 of 14 May 1969, decree N 76-332 of 2 August 1976, 78-480 of 8 November 1978, 78-545 of 28 December 1978, decree N 84-1541 of 1 December 1984, Order N 59-100 of 31/12/1959 and Order No. 039/MTPS/IMT of 26 November 1984.

2.5.1 National Health and Safety Order No. 039/MTPS/IMT of 26 November 1984

The National Health and Safety Order No. 039/MTPS/IMT of 26 November, 1984 contains the general provisions of health and safety that apply to all workplaces in all the sectors of the economy. The order is divided into four sections namely: general

disposition, general health and safety conditions in the workplace, disposition relative to the safety of workers, and control and disciplinary measures.

2.5.1.1 General provisions

Section 1 (1) of the Order N 039/MTPS/IMT regulates the general health and safety of workers at workplace with the aim to protect the health of workers. This Order is applicable to all industries and enterprises with similar health and safety conditions cited in this Order (Order No. 039/MTPS/IMT 1984:1).

Section 1 (2) of the Order No. 039/MTPS/IMT states the obligation of the employers. This article compels the employers to implement all preventive measures to ensure the health and safety of workers at work. Section 1 (3) stipulates that employers must also declare possible hazards at their sites to the Ministry of Labour and Social Security. It is the duty of the employer to ensure that employees are provided with Personal Protective Equipment (PPE) for free and are aware of their rights to work in a safe and healthy work environment (section 1 (5) of the Cameroon OHS Order No. 039/MTPS/IMT 1984:1).

Section 1 (7) compels all workers to strictly comply with the laws and regulations related to health and safety at workplaces and to respect decisions of the employers in order not to disrupt the implementation of the preventive measures. Section1 (8) recommends the creation of a health and safety committee at the workplace (Order No. 039/MTPS/IMT 1984:3).

2.5.1.2 General health and safety conditions in the workplace

Section 2 outlines the standard norms of constructions of a workplace. Section 2 (15) of the Order No. 039/MTPS/IMT states that all workplaces must respect the technical conditions that ensure satisfactory health and safety for workers and should be certified by a labour inspectors. Section 2 (17), states that a standard workplace should have a ceiling height of at least 2.5m to enable maximum ventilation. It should have enough space for the installation of machines, level floor and built using durable material. Section 2 (18, 20) requires all workplace to be neat and cleaned at least once a day. Section 2 (23) of the same Order requires employers to provide walkways sufficiently

cleared of obstacles (Order No. 039/MTPS/IMT 1984:5). The employer must ensure that the workplace is well ventilated and the air has similar characteristics to that of normal air (Section 2 (28, 33) Order No. 039/MTPS/IMT 1984:6). This Order also compels the employer to provide adequate lighting as stated in Section 2 (39) while Section 2 (39) requires the implementation of appropriate measures to make sure workers are protected against the negative effect(s) of loud noise and vibration (Order No. 039/MTPS/IMT 1984:8).

2.5.1.3 Provisions relating to the safety of workers

This section describes the general safety measures to be implemented at a workplace. Section 3 (71) of the Order No. 039/MTPS/IMT interdicts the operation of faulty equipment or dangerous equipment without guards/appropriate PPEs (Order No. 039/MTPS/IMT 1984:12). All dangerous equipment must be protected or isolated and all untrained workers must be prevented from having access to them as stated in Section 3 (72). According to Section 3 (64) all equipment must be examined periodically and maintained regularly by a competent person, and the details registered by the experts. According to Section 3 (96) of the same Order, all employers must take particular measures to eliminate all forms of dangerous substances in the workplace and to conduct employee health surveillance and provide treatment where necessary. Furthermore, Section 3 (117) of Order No. 039/MTPS/IMT requires all workplaces to have first aid kits to enable them administer first aid to accident cases while Section 7 (119) of the same Order requires all workplace to have fire extinguishers for fire safety and to implement preventive measure to prevent fire accidents (Order No. 039/MTPS/IMT 1984:17).

2.5.1.4 Enforcement and disciplinary measures

Section 4 (129) of Order No. 039/MTPS/IMT charges the labour inspector and Occupational health and safety practitioners with the task of controlling the health and safety conditions elaborated in this Order at the workplace.

Section 4 (130) gives the enforcement agents the power to sanction an employer if fails to conform to the Order 039/MTPS/IMT after three successive warning according to S.R.370 (12e) of the Cameroon Penal code (Order No. 039/MTPS/IMT 1984:19).

2.5.2 The regulations for conditions of employment according to the Cameroon Labour Code Law No. 92/007 of 14 August 1992

Provisions of the Labour Code (Law no. 92/007) Part VI stipulating the general principles for workplace health and safety. Of importance here is the distinction between Safety (Chapter 1) and occupational health chapter 2) which has stagnated the practice of OHS in Cameroon.

Enforcement of regulations is very vital in ensuring the efficacy of regulations. The very nature of the informal economy makes it almost impossible for governments to enforce the sector given that most small scale woodworking in Cameroon takes place in homes, public places, streets, opened air, un-safe work and unhealthy places and they are very unstable. This makes it very difficult for inspectorates to inspect and investigate working conditions or get information and advice to the people who need it (Alli 2008:7). Also, the lack of OHS legislation is exemplified by the non-existence of a precise law to regulate woodworking activities in Cameroon. The lack of OHS legislation and strict enforcement of OHS regulations enables non-compliance to OSH regulations (Nnedinma, David, Keith & Umeadi 2014:93).

2.5.2.1 Hours of work

Section 80 of the Cameroon Labour Code No. 92/007 of 14 August, 1992 states that the statutory hours of work in all public and private non-agricultural establishments may not exceed forty hours per week while for agricultural and allied undertakings, the hours of work are a total of two thousand four hundred hours per year, within the maximum limits of forty-eight hours per week. The above provisions apply to all workers, irrespective of age, sex and the mode of payment.

Section 88 (1) Order No. 92/007 of 14 August, 1992 states that weekly rest shall be compulsory and it shall consist of at least 24 (twenty-four) consecutive hours each week. Such rest shall fall as a rule on Sundays and may under no circumstances be replaced by a compensatory allowance (Cameroon Labour Code Order No. 92/007 1992:24).

2.5.3 National Occupational Health and Safety Commission as prescribed Chapter III Section 8-10 of Order No. 039/MTPS/IMT

According to the ILO (2001:5), health and safety management committees should consist of a body of inter-related elements namely: policy, organising, planning and implementation, evaluation as well as action for improvement. Chapter III Section 8-10 of Order 039 regulate workplace health and safety committees has made provisions for the National Occupational Health and Safety Commission a consultative body within the Ministry of Labour and Social Security which is charged with similar functions of studying the problems related to industrial medicine, hygiene and safety of workers. They are responsible for making suggestions and recommendations concerning laws and regulations; making recommendations for the benefit of employers and workers, insurance bodies and various ministries concerning the protection of the health of workers; making proposals concerning the approval of dangerous machinery and manufacturing processes likely to endanger the health of workers and carrying out or participating in any work of a scientific nature falling within its sphere of activity.

2.6 LITERATURE REVIEW FINDINGS RELATING TO THE DEMOGRAPHIC CHARACTERISTICS OF EMPLOYEES IN THE SMALL-SCALE AND INFORMAL WOOD ENTERPRISES

2.6.1 Gender distribution of employees in the small wood industry

Previous studies conducted in Nigeria, Ghana and Nepal have revealed that a majority of woodworkers in wood enterprises are males (Agbana, Joshua, Daikwo & Metiboba 2016:28; Alao & Kuje 2012:51; Mijinyawa & Bello 2010:153; Effah, Antwi, Adu & Boampong 2013:124; Ochire-Boadu et al 2014:235). For example, a cross-sectional study conducted in Malaysia among wood furniture and bamboo workers had almost all respondents being males, reflecting the low number of women employed in the wood industry in Malaysia (Ratnasingam, Ramasamy, Ioras, Thanesegaran & Mutthiah 2016:1196). Similarly, another study conducted in, Ghana among woodworkers revealed that a majority of respondents (87%) were males and the remaining 13%, females (Effah et al 2013:124). In addition, a study conducted by Alao and Kuje (2012:51) found that all the furniture producers in Nigeria were male (100%).

2.6.2 Age distribution of employees in the small-scale and informal wood enterprises

Studies conducted in most sub-Saharan Africa countries such as Nigeria, Zimbabwe and Tanzania have shown that a majority of woodworkers in small scale wood enterprises are young males (Bolaji 2005:101; Ochire-Boadu et al 2014:235; Rongo & Leon 2005:36; Steven 2012:280). A cross sectional study carried out in the Tamale, Metropolis of the Northern region of Ghana to assess the occupational hazards and safety practices among woodworkers in small scale sawmilling industries showed that 65% of the respondents were within the age range of 25-44 years while 15% were less than 25 years (Ochire-Boadu et al 2014:235). In addition, an analytical study conducted in Oyo State of Nigeria among carpenters, showed that 60.3% of respondents were less than 25 years while 20.5% of respondents were between 26-30 years. The remaining 19.2% were more than thirty years old with an average age of the respondents being 26.33 years (Bolaj 2005:101). Finally, a study conducted among woodworkers in Mutare, Zimbabwe showed that most workers continued working up to the age 59 (Steven 2012:280).

2.6.3 Level of education among workers in the small scale wood industries

A majority of woodworkers in small-scale wood enterprises have completed only primary education and had acquired their skills and expertise on the job through apprenticeship training according to a study conducted by Ochire-Boadu et al (2014:235) which aimed at assessing the occupational hazards and safety practices among small scale sawmilling Industries in Ghana. Furthermore, another study conducted in Nigeria by Bolaji (2005:102) to investigate the attitude of carpenters towards safety and occupational health practices in Nigeria affirms that a majority of woodworkers in Nigeria are unskilled and have completed just the primary level of education. Likewise, a study by Mijinyawa and Bello (2010:154) on assessment of injuries in small scale sawmill Industries also showed that most woodworkers came in the sector as traders and not as a trained woodworkers and without requisite professional knowledge.

2.6.4 Level of work experience among woodworkers in the small scale wood enterprises

A survey conducted by the Bolaji (2005:101) on carpenters to investigate the attitude towards safety and occupational health practice in Oyo State, Nigeria noted an average work experience of 4.5 years and over 65.4% of the respondents had worked for five years. A related study by Steven (2012:280) to identify occupational health and safety problems among workers in the wood processing industries in Zimbabwe also revealed that workers had a mean work experience of 5 years (range 0-9 years). On the other hand, Agbana et al (2016:30) reported higher average years of work experience of 13.27±10.19 years in their recent study to assess the knowledge of occupational hazards among Nigerian sawmill workers though the statistically significant difference between these averages had not been verified.

2.7 LITERATURE REVIEW FINDINGS ON THE KNOWLEDGE AND PRACTICE OF WOODWORKERS IN SMALL-SCALE AND INFORMAL ENTERPRISES

2.7.1 Knowledge of occupational health and safety among woodworkers

According to Mitchual, Donkoh and Bih (2015:181), occupational health and safety awareness/knowledge is regarded as being aware of safety issues and the potential hazards to oneself and others in the workplace. Workers need to be aware that it is their right to work in a safe and healthy working environment (Alli 2008:17). Though, the workers have the right to ample information about health and safety and to immediately stop work in case of looming danger to their safety or health (Alli 2008:20), it is the responsibility of both employers and workers to keep the workplace safe from any imminent danger.

Notwithstanding, a couple of studies have revealed poor OHS knowledge scores among woodworkers (Agbana et al 2016:31; Bolaji 2005:102; Osagbemi, La-Kadri & Aderibigbe 2010:328). For instance, a study conducted by Bolaji (2005:102) on woodworkers in Nigeria revealed that 33.3% of woodworkers were aware of at least five hazards while 57.6% mentioned between six and ten hazards. Only 9% mentioned more than ten hazards. Detailed analysis showed that 23.1% had low knowledge, 61.5% had moderate knowledge while only 15.4% had high level of knowledge.

Furthermore, a cross-sectional study by Agbana et al (2016:31) to determine the knowledge of occupational hazards among sawmill workers in Nigeria noted that a majority of woodworkers in the study groups had poor knowledge of the dangers of sawmill dust and health effects of the dust. This was probably due to the fact that most of the respondents received their training through apprenticeship and thereby relied on their masters for information on the job especially knowledge of hazards associated with wood dust of which the master might have probably had insufficient knowledge too. This lack of formal training for the job might not allow the workers to be aware of the hazards associated with their occupation as well as possible precautions to be taken in their vocational responsibilities. Also, a study conducted by Ringo (2005:16) in Tanzania reported low levels of awareness among wood machine operators concerning the major areas of ergonomics and that workers in SSEs had acquired little skills as wood machine operators apart from on-the-job training.

According to Agbana et al (2016:31), low level of education is the main determinant of poor knowledge of OHS in Nigeria. This was attributed to the fact that being educated increases access to information education and communication materials leading to increased awareness on various workplace hazards. Furthermore, a study by Osagbemi et al (2010:328) in North Central Nigeria reported that the low levels of awareness of various occupational hazards among sawmill workers had a significant influence on the level of use of safety measures. Thus, there is a need to improve the level of knowledge availability and use of safety measures among the workers through subsequent sensitisation and enlightenment (Osagbemi et al 2010:328). Likewise, Siripanich, Siriwong, Keawrueang, Borjan & Robson (2014:144) has affirmed that small factories in Thailand are running under un-standardised and unsafe conditions probably due to lack of awareness among workers working in these industries.

Contrary to recent findings reported by Mitchual et al (2015:187) in neighbouring Ghana reported that educational levels of woodworkers had no significantly influence on their awareness of occupational health and safety issues relating to their work. In addition, Rongo and Leon (2005:36) in their study titled “Qualitative method for assessing in small-scale wood industries in the informal sector” with one of the aims being to assess woodworkers’ knowledge relating to wooddust exposure, revealed that a majority of woodworkers were aware of the fact that inhalation of wood dust could be hazardous.

The study further reported that even those workers who knew nothing about health effects of wood dust were still of the opinion that wood dust could be harmful to the body. A cross-sectional study by Diwe, Duru, Iwu, Merenu, Uwakwe, Oluoha, Ogunniyan, Madubueze and Ohale (2016:65) also revealed that a majority of workers were aware of the hazardous nature of wood dust. (95.9%) of them reported that their sources of awareness were mainly from personal experience and during training and least from health education programmes.

A similar study by Onowhakpor, Abusu, Adebayo, Esene and Okojie (2017:62) revealed a significant association between age and knowledge of occupational hazards among respondents. With increasing age, workers tend to be more exposed, experienced, and aware of various occupational hazards.

2.7.2 Occupational health and safety practices among woodworkers

A qualitative study to assess dust exposure in small-scale wood industries in Dar es Salaam by Rongo and Leon (2005:37) noted that most of the wood industries lacked the provision of personal protective equipment (PPE) for its workers. Further analysis revealed that only about 5% of the industries had special masks while the rest of the industries had either make-shift facilities or none at all. In addition, Faremi, Ogunfowokan, Mbada, Olatubi and Ogungbemi (2014:1247) revealed that though woodworkers in Nigeria agreed that face masks, protective goggle, hand gloves and boots were safety devices necessary for safety at the workplace. However, face masks were sparsely used by the workers and the reasons for the non-use of safety devices among the sawmill workers were largely due to forgetfulness or the belief that they were not convenient or necessary (Faremi et al 2014:1247).

The use of personal protective equipment tends to be poor and inappropriate in the wood processing industries. A descriptive study conducted among wood processing industry workers in Mutare, Zimbabwe to explore occupational health and safety problems illustrated that workers could be seen wearing their nose masks, but some had the nose masks on their foreheads as they found them uncomfortable (Steven 2012:281). Similar findings were also noted by Ratnasingam et al (2016:1195) in their study among wood and bamboos workers in Malaysia. They reported that most of the workers were not using personal protective equipment to protect themselves from

injuries. This factor could lead to occupational accidents among workers during production activities. Studies conducted in Nigeria have shown less than 15% (Osagbemi 2010:327) and 5% (Oppliger, Rusca, Charriere, Trinh & Droz 2005:389) use of PPE among workers and reasons for the non-use of PPE have also been attributed to forgetfulness, affordability, inconvenience and perception as being unnecessary.

2.7 LITERATURE REVIEW FINDINGS ON THE NATURE AND MAGNITUDE OF WORK-RELATED INJURIES AND DISEASES IN THE WOOD INDUSTRY

(i) Global estimates

It is estimated that every year over 1.1 million people worldwide die of occupational injuries and work-related disease, ranked the 10th leading cause of morbidity and mortality according to the WHO (1999:12). In developing countries, the risks that foster ill health are estimated to be 20 times higher than in developed countries (Demba, Malleh & Mendy 2013:3). The estimated economic loss caused by work-related injuries and disease was equivalent to 4% of the world's gross national product. This is because in developing countries, a majority of the workforce is employed in small and medium-scale industries that do not meet the minimum standards and guidelines set by the WHO and the ILO for occupational health, safety and social protection (Ratnasingam et al 2016:1195).

For example, these are the injury and disease rates that were found in a Gabon study on a wood processing plant. All workers were highly exposed to at least one hazard in addition to the usual wood processing risks, such as wood dust, noise and heat (Colman et al 2007:45). Also during the period 2007–2008, accidents involving contact with objects or equipment exceeded all other events and accounted for 64.1% of traumatic occupational accidents (Colman et al 2009:15). These are the rates that were found in smaller studies. In Nigeria mill operators suffer highest rates of 83% while moving planks of wood into milling machines such as moulder machines. Timber stacking accidents accounted for 36% while transport accidents stood at a 22% injury rate (Bello & Mijinyawa 2010:6). Another study by Mitchual et al (2015:16) to assess safety practices and Injuries associated with wood processing in a timber company in Ghana reported an injury rate of 40.5% among woodworkers.

(ii) Local estimated injury rates among workers in wood industries

Even though an economic study conducted in 2006 among the working population estimated the manpower engaged in the wood industry in Cameroon at 16 000 (ITTO 2014:9), no study has been conducted on woodworkers to estimate the injury rates neither in the large nor small scale wood industries in Cameroon. Thus, this study was the first study to make known injury rates in small-scale and informal wood processing industry in Cameroon.

2.7.3 Nature of injuries in the small scale and informal woodshops

Cut, laceration, bruises, sprains in the workers hands and wrists, severed fingers amputations, injuries from entrapment by machines and from falling logs and planks are the most common occupational health accidents that reported in the wood industries in Nigeria and Malaysia (Mijinyawa & Bello 2010:151; Ratnasingam et al 2016:1196). In Malaysia, cuts, bruises and sprains in worker's wrist and hands were the most common injuries among wooden furniture industries according by Ratnasingam et al (2016:1196). In Ghana, accidents and injuries in small scale sawmilling industries are mostly caused by rotating devices, cutting or shearing blades, wood handling and vehicle accidents (Ochire-Boadu et al 2014:235).

According to findings by Jinadu (1990:63), in a case-study of accidents in the wood processing industry in Nigeria, the commonest injuries were lacerations by revolving saws, followed by crush injuries from entrapment by machines and from falling logs and planks. Another study by Asrat, Bezuayehu and Andualem (2017:211) reported cuts, laceration and punctures as the most common types of injuries recorded especially among wood and metal workers in Southwest Ethiopia.

2.7.4 Causes or sources of occupational injuries among woodworkers in small scale woodshops

Woodworkers have the tendency to not adhere to safe working procedures. They operate woodworking equipment without or inappropriately fitted safety guards and this predisposes them to common injuries like, severed fingers, laceration, amputation, and others according to empirical findings (Effah et al 2013:126). Research findings by

Ochire-Boadu et al (2014:235) revealed that over confidence/negligence, blunt/obsolete tools or machines, the low or non-use of PPE, long working hours without rest and inadequate knowledge are the major factors that lead to accidents/injuries. This study also revealed that woodworkers in Nigeria worked for longer extended periods with minimum or no time for rest/break. This increased the risk of errors and decreased vigilance of workers thus, increasing the likelihood of hazards. Lack of formal education adversely affected the efficiency of the workers as most of them could not read health and safety notices, posters and signals to avert dangers at the workplace (Ochire-Boadu et al 2014:235). Also, enterprise owners and managers do not provide sufficient maintenance and funds to buy protective equipment, thus workers could be seen working without PPE (Steven 2012:279). Compliance with health and safety requirements is effective in reducing workplace injuries and illnesses which are costly to employers (Robson, Clarke, Cullen, Bielecky, Severn, Bigelow, Irvin, Culyer & Mahood 2007:333).

2.8 LITERATURE REVIEW FINDINGS ON OCCUPATIONAL HEALTH AND SAFETY CONDITIONS IN SMALL-SCALE WOOD ENTERPRISES

2.8.1 Workplace conditions

Wood workshops like other high-risk workplaces are characterised by a high degree of exposure to hazardous agents, which significantly endanger the health and life of workers (Tziaferi, Sourtzi, Kalokairinou, Sgourou, Koumoulas & Velonakis 2011:260). Hazards are an inherent property of a substance, agent, source of energy or situation that has the potential to cause undesirable consequences while risk is the probability that damage to “life, health, and or the environment” may occur from a hazard. In this regard, occupational hazards refer to workplace activities that have the potential to cause/increase the risk of injury or ill health (Tziaferi et al 2011:260).

Small-scale and informal wood workshops are mostly located along the main roads, in streets and dilapidated structures whose activities are temporary. Findings of research conducted in Nigeria showed that many small woodworking enterprises operate in unsuitable workplaces and poor environmental conditions often with no distinction of home and working place. Therefore, predisposing workers as well as neighbouring

communities to elevated levels of injuries and diseases (Bello & Mijinyawa 2010:8; Judd & Wiedenbeck 2004:15).

An overview of common occupational hazards in the wood working industry

Occupational hazards refer to the degree of or risks posed by activities and programmes at a workplace. Woodworking activities include carpentry, small saw and moulding mills using mainly artisanal equipment such as chainsaws or mobile saws, planning, sawing, spinning, sandpaper bandsaw, compressor, cutting machines etc. This exposes the workers to different hazards such as physical hazards, chemical hazards, manual handling hazards/ergonomic hazards at the workplace. Between 10 and 30% of the workforce in industrialised countries and up to 80% in developing and newly industrialised countries are exposed to a variety of these potential hazards (Takele & Mengesha 2006:40).

2.8.1 Type or nature of physical hazards and their impact on workers in wood processing industries

Physical hazards are hazards that arise at work due to the influence of various forms of energy and generally perceptible and discernible (Mittlestaedt, Bartram, Wooler, Pond & Mood 2000:1). Examples of physical hazards that may pose dangers to woodworkers include: noise, vibration, unhealthy microclimatic, electrical hazards, falls from heights (Colman et al 2007:44). Afolabi (2014:26) in a study conducted in Nigeria on the OHS hazards in small scale industries made known that about 3.6 million children working in the informal SSI sector observed that over half were exposed to physical hazards including extreme temperatures, humidity, and noise.

2.8.1.1 The impact of woodworkers' exposure to noise

Noise is any unwanted or damaging sound that may damage the hearing and cause other health effects such as stress, hypersensitivity to noise, increased blood pressure sleep disturbance, anxiety, headaches, nausea and increased heart rate (Qutubuddin, Hebbal & Kumar 2013:10; New Zealand Department of Labour 2011:9). Research has shown that the problem of noise from operating machinery is still prevalent in a wide range of occupations including wood processing (Steven 2012:282). Sawmill machines are very noisy, and it has been revealed that verbal communication during operation of

the machines was almost impossible which could lead to accidents (Oluwatosin, Adeleye, Olugbemiga, Adenike & Saliu 2015:10).

Though exposure limits have been set by most national governments and international organisations (Steven 2012:282), studies still show that noise level in wood industries in Malaysia and Gabon could be up to 85 dB or more, a level which is known to contribute significantly to occupational injuries (Colman 2007:45; Rus, Daud, Musa & Naing 2008:28). Noise-induced hearing loss is most commonly a degenerative condition that has a long latency, with symptoms worsening as a result of cumulative exposure. However, physical damage to the eardrum following a single peak exposure can also result in a permanent hearing loss. In spite of this, studies have continued reporting that a majority of workers are still unaware in Malaysia and Nigeria that noise poses a hazard in sawmills (Osagbemi et al 2010:327; Rus et al 2008:28).

2.8.1.2 Impact of woodworkers' exposure to vibration

A study by Malinowska-Borowska (2014:177) revealed that vibration might be a major perceived cause of health hazards among woodworkers. Both hand-held and stationary equipment that pass on vibration through a work piece can cause hand-arm vibration syndrome (HAVS) or vibration "white fingers" (Malinowska-Borowska 2014:177). White fingers, or Reynaud's Syndrome, is a disease of the hands wherein the blood vessels in the fingers collapse due to repeated exposure to vibration (OSHA 1999:33). The skin and muscle tissue do not get the oxygen they need and eventually die. A worker with advanced HAVS may be disabled for a long time. Hence, in epidemiological studies, there is often no correlation between vibration exposure assessed according the ISO-5349 model and health effects observed in workers exposed to vibration (Bovenzi 1998:509; Bovenzi & Zadini 1990:129).

2.8.1.3 Impact of woodworkers' exposure to extreme temperatures and ventilation

A survey by Steven (2012:280) to explore occupational health and safety problems among workers in the wood processing industries in Mutare, Zimbabwe reported that apart from the usual wood processing risks such as wood dust and noise, workers also reported heat radiated from the operating machines or UV radiation from the sun as one

of the challenges they face in the woodworking sites especially for woodshops. They also lack fans or air conditioners to mitigate excessive heat conditions in very tight and congested working environments. This may cause the body's heating mechanism to break down, leading to temporary or permanent disturbances in bodily functions (Workplace Safety and Health Council and Ministry of Manpower 2012:9).

A study conducted by Osagbemi et al (2010:327) among sawmill workers in Nigeria, reported that workers carried out their woodworking activities in poorly ventilated sites. This is because the air they breathed at work contained excessive amount of dust due to closed-in-work areas, small sized windows and single doors, and lack of local exhausts to extract wood dust produced, accounting for poor air circulation (Osagbemi et al 2010:327). In addition, a study by Oppliger et al (2005:390) to assess the bioaerosols and inhalable dust exposure in Swiss sawmills reported increased prevalence of respiratory symptoms, principally cough, chest pain and sputum production among sawmill workers.

2.8.1.4 Exposure of woodworkers to chemical hazards

Chemical hazards consist of exposure to large quantities of cellulose, hemicelluloses, lignin and hundreds of compounds known as "wood extractive" from wood dust and maxine, xylene, diluant, vanish, painting oil mastic, methyl ethyl ketone (MEK), toluene, methyl isobutyl ketone (MIBK) and Methanol from synthetic chemicals used for wood processing that can lead to a variety of respiratory tract, cancers and skin diseases (Bosan & Okpapi 2004:26; Effah et al 2013:126; Jette 2008:83; Rongo & Leon 2005:32). In addition, natural substances in wood dust such as resin acids or monoterpenes and or preservatives are examples of chemical hazards to woodworkers as it can cause reactions (Rongo 2005:12).

Working in an environment with wood dust leads to inhalation of particles through the respiratory tract, causing health effects when the wood particles are deposited and come in direct contact with the tissue covering the respiratory tract, thus causing harm (Bosan & Okpapi 2004:26). According to a study conducted by Badirdast, Azari, Soussan, Ghadjari, Khodakarim, Davod, Fadaei and Abolfazl (2017:54) to measure the effect of wood aerosols and bioaerosols on the respiratory systems of wood working industry workers in Iran revealed that the rate of inhalation of wood dust depends on the

activities of the workers and that the highest exposure to inhalable wood dust was noted amongst those in shredding operations. Badirdast et al (2017:59) further explained that, considering the high level of exposure among woodworkers in the study along with their lung function results, long-term exposure to wood dust may be detrimental to workers' health. In addition, Rongo and Leon (2005:32) revealed that most of the woodwork is done manually and skin exposure to wood dust is quite enormous and eventually workers contract skin allergic reactions.

A case-control study conducted by Mohan, Aprajita and Panwar (2013:1589) to establish the effect of wood dust on the respiratory health status of Carpenters in India reported that a decrease in duration of exposure on peak expiratory flow rate (PEFR) in carpenters was probably due to a continuous exposure to wood dust, which had caused an adverse effect on their respiratory status. According to a study by Alwis (1998:157) on the occupational exposure to wood dust in Australia woodworkers had significantly high prevalence of cough, phlegm, chronic bronchitis, frequent headaches, eye and throat irritations, and nasal symptoms compared with controls. The prevalence of chronic bronchitis was high among smokers compared with non-smokers. The prevalence of asthma, phlegm, wheezing, chest tightness, sinus problems, throat irritation, and nausea was high among joinery workers compared with sawmill and chipmill workers (Alwis 1998:157).

2.8.1.5 Exposure of woodworkers to ergonomic hazards

Ergonomics hazards in wood processing industries involve bending awkwardly to push and lift heavy logs of planks onto the work table and maintaining the same standing position for hours to plan and sandpaper the wood with the head bent downward (Colman 2007:45; Steven 2012:280). The use of excessive physical force to operate heavy wood machines, lifting and moving of planks, or repetitive manual tasks may lead to the high level of physical manual labour as argued by Faremi et al (2014:1246) who drew on a cross-sectional survey of recruited saw-mill workers at Opa, Ile-Ife, Nigeria. Findings from a study of wood processing industries in Ghana by Adei and Kunfaa (2007:69) revealed that occupational exposure to ergonomic hazards in the wood processing industries of Mutare were mainly due to lifting weights, uncomfortable posture during working hours where woodworkers could stand up for as long as seven hours of an eight hour shift.

Study findings by Ochire-Boadu et al (2014:235) obtained from the survey of twenty small-scale sawmilling industries in Tamale Metropolis (Ghana) affirmed that woodworkers had waist pains due to heavy lifting and pulling movements as well as awkward positions whiles performing their woodworking tasks. Similarly, another Ghanaian survey conducted by Adu et al (2015:2679) on woodworkers showed that almost all the wood factory floor workers who pushed, lifted or jacked heavy lumber onto the work table and maintaining the same posture to work accumulated stress in their lower back causing pains.

2.8.1.6 Exposure of woodworkers to psychological hazards

A systematic review of factors associated with psychological ill health and associated absenteeism (Michie 2002:69) identified the following variables: long hours worked, work overload and pressure, the effects of these on personal lives, lack of control over work and lack of participation in decision making, poor social support, unclear management and work role and poor management style in small scale workplaces.

Psychosocial and work organisation factors have played a large part in the occurrence of upper extremity disorders among carpenters in USA according to Lemasters et al (1998:426). Lemasters et al (1998:426) revealed that few studies have investigated the role of job related psychosocial stressors and work organisations in the occurrence of work related musculoskeletal disorders, particularly in carpenters. A majority of informal sector workers do not work on the basis of a contract, so vital contractual aspects such as social security rights are completely left discarded by owners of these businesses (Kijem 2009:22). It is also known that a worker is at a greater risk when control over a task is low, but the demands of a job are high (Michie 2002:69). For instance, a study by Osagbemi (2010:326) to explore occupational hazards, health problems and safety measures among sawmill workers in North Central Nigeria reported that woodworking activities are very stressful and exhaustive due to high demands and low decision latitudes. Also, according to the explanatory model of Michie and Williams (2003:9), work related strain and risks to health are most likely to arise when high job demands are coupled with low decision making prowess.

2.8.1.7 Fire safety and first aid availability

A survey conducted by Afolabi (2014:27) to establish the occupational health hazards among small scale industries including wood industries in Nigeria reveal that small scale industries do not comply with OHS standards. The provision of appropriate fire extinguishers and first aids kits were abysmally poor among the sampled enterprises with very few enterprises owning appropriate fire extinguishers and first aids kits. For example, of the 250 enterprises that participated in the study, only 38% and 46% did provide appropriate fire extinguishers and first aids kits respectively, to their employees (Afolabi 2014:27). Another study conducted by Diwe et al (2016:69) with the aim of evaluating the occupational hazards, safety and hygienic practices among woodworkers in a South Eastern State of Nigeria reported that of the 319 wood enterprises surveyed, none of the sites had appropriate fire extinguishers and only one site had a first aids kit available at the site to be used in case of accident.

2.8.2 Occupational health and safety training of employees

The training of workers in health and safety is an indispensable component of the health and safety management programme and ensures that workers assume their duties competently and safely, thereby strengthening a culture of prevention at work (GOHNET 2007:3; WorkSafe BC 2013:27). According to the ILO (2001:18), employers must recruit competent staff supportive of all aspects of the organisation's OHS management system. Review findings show that woodworkers do not agree on the elements of training and supervision which make it clear that workers are not given the needed training and supervision on their work safety whereas, they are made aware of safe work procedures (Effah et al 2013:126).

It has also been established in literature that woodworkers do not give preference to basic training in work safety during operations. According to a survey carried out among 64 sawmill workers by Mijinyawa and Bello (2010:154), none of the workers had attended any safety training during their job period. The knowledge acquired was based on the apprenticeship, training and experience gathered on the job. Besides, a study by Asrat et al (2017:210) conducted among woodworkers in Mizan-Aman town Southwest Ethiopia affirmed that most woodworkers are not trained on occupational safety and

health. They also indicated that there is a strong relationship between training on health and safety and reduced work accident rates among woodworkers in the study sites. Thus, efficient training and supervision can reduce the huge human, social and economic costs of occupational accident, injuries and diseases and major workplace disasters that have long been causes for concern at all levels from the individual workplace to the national and international levels (Alli 2008:7).

2.8.3 Provision of personal protective equipment

A cross sectional study conducted among Nigerian sawmills workers revealed that only 34.0% of the respondents used face mask regularly as a safety device. A majority of the respondents admitted to never using hand gloves, aprons, ear mufflers and lifters (Faremi et al 2014:1246). In addition, Ratnasingam et al (2016:1195) affirmed that most workers in the furniture industries did not follow safety regulation and did not use PPE to protect themselves from injuries. Similar observations have been noted by Steven (2012:280) where he also affirmed that the use of personal protective equipment was poor and inappropriate in the wood processing industries, as some workers were seen wearing nose masks instead on their foreheads because they found them uncomfortable to wear appropriately. The use of PPE would not only decrease occupational injuries among workers during the working activities but also prevent workers from wooddust exposure (Ratnasingam et al 2016:1195; Shirin 2010:4).

2.8.4 State of work equipment and maintenance

A study to assess injury rates in the small-scale sawmill industry in South Western Nigeria by Bello and Mijinyawa (2010:6) reported that major risk factors easily noticeable in most of the wood processing sector is the age factor of the machine and equipment in use. Most of the machines are outdated with most of the safety guards removed or non-functional and capable of causing serious injuries. According to Steven (2012:280), enterprise owners and managers usually do not provide sufficient maintenance; not much attention is thus given to the safety of processing machines, equipment and tools as well as their link to health requirements in such enterprises. Whereas, the good state of the equipment and proper maintenance ensure compliance with legal requirements by the woodworking enterprises and also guaranteeing safe and healthy working conditions for the workers.

2.8.5 Housekeeping practices in small scale woodshops

Woodworking by nature generates a lot of waste-sawdust and in the absence of a proper disposal method, the waste is burnt in open air (causing air pollution) and this certainly constitutes a health hazard to the population around that particular area (Olawuni & Okunola 2014:168). A study by Colman et al (2007:45) on occupational health and safety problems among workers in wood processing enterprises in Gabon revealed that in addition to the usual wood processing risk hazards, woodworkers were frequently exposed to sharp metals and objects, flying and falling objects due to poor health and safety and hygienic conditions in the woodshops. Findings by Steven (2012:280) on occupational health and safety problems among workers in the wood processing industries in Zimbabwe show that in addition to the usual wood processing risks such as wood dust, noise and heat, workers reported exposure to sharp metals and objects, flying and falling objects and poor hygienic conditions such as the irregular cleaning of wood dust from the floor.

2.9 LITERATURE REVIEW FINDINGS ON OCCUPATIONAL HEALTH AND SAFETY INTERVENTIONS TO PREVENT OCCUPATIONAL HAZARDS IN INFORMAL SECTORS

This section consists of a synthesis of two methods of prevention and control of occupational hazards and risks. This study made use of the global approach to occupational health and safety put in place at the Global Conference on Connecting Health and Labour held at the Hague. The Hague Conference was part of a global process to improve coverage of and access to occupational health services as requested by the 60th World Health Assembly in 2007 (WHO 2012:3). This is In line with the generic approach to prevention and control of occupational hazards, which are the hierarchies of control as stated by Burton (2010:84). These hierarchies of control measures are presented under the 3 levels of prevention or the hierarchy of controls in OHS.

2.9.1 Outline of the hierarchy of controls in occupational health and safety

Hierarchy of Controls (HoC) is a system used to reduce the severity of hazards in the workplace (Department of the Interior Bureau of Reclamation 2015:2). It is the global approach that has been adopted by the WHO for the prevention and control of hazards in a workplace. According to Burton (2010:84), potential hazards within a work environment can result in illnesses and injuries and thus must be recognised, assessed and controlled through a hierarchy of controls that include elimination or substitution, engineering controls, administrative controls and personal protective equipment, preferably in that order.

Elimination is the most effective control, and therefore evaluation should take place to determine whether this outcome is feasible. If elimination is not feasible, then substitution should be examined next. This process continues until all possible controls have been exhausted, and PPE is the only remaining control Department of the Interior Bureau of Reclamation 2015:2). Figure 2.1 is a visual representation of the process.

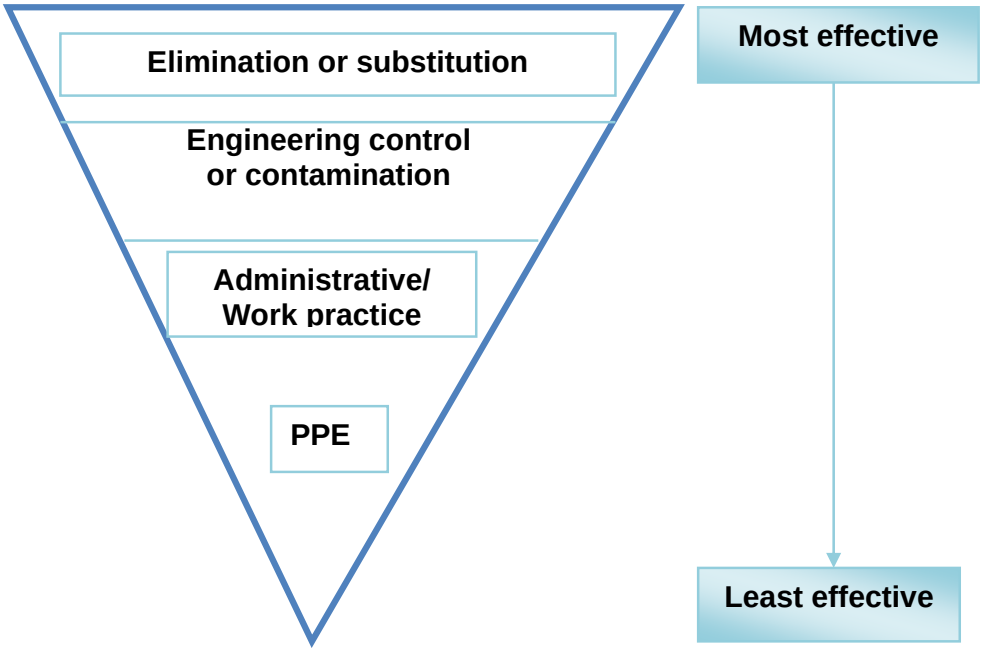

Figure 2.1 Hierarchy of controls

(Department of the Interior Bureau of Reclamation 2015:2)

2.9.2 The implementation of hierarchy of controls to prevent occupational hazards and risks at works

Successful strategies to prevent work-related health problems involve three levels of prevention: primary prevention focuses on the workplace hazards at the organisational level; secondary prevention focuses on providing workers with the tools to deal appropriately with hazards; and tertiary prevention focuses on reducing the suffering of workers who have been exposed to the hazards/problems (Work Safe Alberta 2011:29). In each of the prevention levels, specific workplace hazards were considered and examples of best practices for eliminating or reducing these hazards provided.

2.9.2.1 Primary prevention of occupational hazards in health care workplaces

Prevention strategies aim at meeting the basic standards for workers' health through the developing and implementing healthy workplace programmes. These strategies are analogous to elimination of the hazard or engineering controls as the highest level of control in the hierarchy (Work Safe Alberta 2011:29). Investing in primary prevention of occupational hazards is more cost-beneficial than taking measures for secondary and tertiary prevention of occupational and work-related diseases and accidents. It also saves preventable human suffering and loss of the potential to earn income. Workers, process engineers and line managers should be provided with proper information and training in recognising occupational hazards and in applying the measures for their primary prevention. In addition, the workplace provides suitable circumstances for health promotion and the prevention and control of communicable and non-communicable diseases (GOHNET 2007:3).

2.9.2.1.1 Workplace-based programme to improve diet and promote physical activity

Macera and staff of the Division of Nutrition and Physical Activity National Center for Chronic Disease Prevention and Health Promotion (2010:2) reported that unhealthy diet and lack of regular physical activity are related to several adverse health outcomes, such as heart disease, diabetes, stroke, and cancer in their study titled "Promoting healthy eating and physical activity for a healthier nation". There also is empirical evidence that these factors contribute to the development of musculo-skeletal disorders (MSDs) but little knowledge of whether or not they interact with physical workload to

increase risk even further (GOHNET 2007:3). Also, programmes and policies aimed at promoting diet and physical activities at the workplace could prevent chronic diseases.

Effective communication is also needed to achieve success through substantive health messages in order to educate employees regarding healthy behaviours such as regular physical activity and healthful diet (Quintiliani, Sattelmair & Sorensen 2008:12). By promoting wellness and risk factor reduction, enterprises may avoid unnecessary health costs, enhance productivity, reduce absenteeism and turnover, and encourage their employees through demonstrated commitment to their wellbeing (Quintiliani, Sattelmair & Sorensen 2008:12).

2.9.2.1.2 Work organisation/work re-structuring

A good employer designs and manages work in a way that avoids common risk factors for stress and prevents as much as possible, foreseeable problems. Organisational policies should focus on health behaviours, stress management, or coping skills to manage job stress (Noblet & LaMontagne 2006:349).

Improve employees' control over the way they do their work for example allows flexibility to deal with work-life conflict situations, job-sharing, more consultation about working practices. Increasing the amount and quality of support they receive, for example, introduce people management training schemes for supervisors, provide supervisory and co-worker support, encourage cooperation and teamwork (Burton 2010:85). According to Michie and Williams (2003:9), the key work factors associated with psychological ill health and sickness absence in staff were long hours worked, work overload and pressure, and the effects of these on personal lives, lack of control over work, lack of participation in decision making, poor social support, and unclear management and work roles. Successful interventions that improve psychological health and levels of sickness absence used organisational approaches to increase participation in decision making and problem solving, increase support and feedback, and improve communication (Michie & Williams 2003:1). Workplace restructuring programmes empowering respondent decision-making over workplace factors that affect mental or physical health could reduce psychosocial strain and its negative health consequences (Vezina et al 2004:36).

2.9.2.1.3 Organisational culture

Organisational culture is described by Tsai (2011:1) as the shared values, beliefs, or perceptions held by employees about the organisation or organisational unit. Because organisational culture reflects the values, beliefs and behavioural norms that are used by employees in an organisation to give meaning to the situations that they encounter, it can influence the attitudes and behaviour of the staff. Understanding the organisation's core values can prevent possible internal conflict and work stress (Leka, Griffiths & Cox 2003:18).

The pervasiveness of an organisational culture requires that management recognise its underpinning dimensions and its impact on employee-related variables, such as job satisfaction, organisational commitment, and performance (Tsai 2011:1). Kuoppala et al (2008:914) in a systematic review of the literature on the association between leadership and well-being at work and work-related health found that there is a relative lack of well-founded prospective studies targeting the association between leadership and employee health, but the few available studies suggest an important role of leadership on employee job satisfaction, job well-being, sickness absence, and disability pensions. When there is good interaction between the manager and employees, there will be contributions to team communication and collaboration, and encouragement of employees to accomplish the mission and objectives assigned by the organisation, which in turn enhances job satisfaction and reduces counterproductive behaviour (Tsai 2013:1).

2.9.2.1.4 Education (risk communication) and training

Primary prevention of occupational hazards, diseases and injuries require adequate human, methodological and technological resources as well as training of workers and employers (GOHNET 2007:3). An employer has the responsibility to provide training to his employees. Both Section 3 (9-10) of Order No. 039/MTPS/IMT of 26 August 1984 and British Standard OHSAS 18001 (2007) clause 4.4.2 require enterprises to ensure that any person (s) under their control performing tasks that can impact on OHS is (are) competent on the basis of appropriate education, training or experience". (British Standard OHSAS 18001 2007:3). Workplace policies should ensure that employees have acquired the appropriate knowledge and abilities to perform their jobs effectively

by selecting and training them properly and by reviewing their progress regularly (Leka et al 2003:18). Putting in place effective procedures for ensuring the competence of personnel to carry out their designated functions should be made available so as to support employees with the right health and safety skills to keep them safe (WorkSafeBC 2013:27; GOHNET 2007:3).

A study by Adei and Kunfaa (2007:165) on occupational health and safety policy in operation in the wood processing industry in Ghana also emphasised the necessity to train, educate and inform woodworkers on occupational health and safety. This study noted that training, education and information to a large extent increases workers' productivity and reduces occupational injuries among workers. They therefore suggested the need to improve workers' knowledge on the use of machinery and the environment, within which they work through proper safety training, to enable them appreciate the dangers associated with negligence or carelessness (Adei & Kunfaa 2007:165). Training employees to recognise the hazard as an unsafe condition and doing something about it can break a link in the chain of events that could lead to an explosion, thereby preventing it.

2.9.2.1.5 Medical surveillance

Medical surveillance is a means of monitoring the health of employees (Ghanaian Ministry of Public Health 2010:16). It is a planned programme of systematic regular medical examinations designed to enable the early detection of disease or ill health related to particular types of work. It facilitates the establishment of the effectiveness of control measures and provides invaluable feedback to the risk assessment all workers are to undertake because it provides data to help employers evaluate health risks and to raise concerns about how work affects their health (Ghanaian Ministry of Public Health 2010:16). Employers are required to ensure employees are provided with appropriate health surveillance in relation to risks to health and safety identified by risk assessments carried out in accordance with the Regulations according to section 4 (11) of the Cameroon OHS Order No. 039/MTPS/IMT of 26 August 1984 (Order No. 039/MTPS/IMT 1984:3). For example, it is vital to frequently conduct skin-prick testing for respiratory sensitising agents to identify an allergenic response, or thermal and vibrotactile perception threshold tests to confirm the presence of HAVS at the early stage (Ormiston 2013:27). Employees have the right to believe that attending work will

not be harmful to them and that the employer is able to ensure that their health is protected while they are at work (Alli 2008:17).

2.9.2.2 Secondary prevention of occupational hazards in health care workplaces

It is defined as an action which halts the progress of an occupational disease at its incipient stage and prevents complications (Burton 2010:82). The specific interventions are: early diagnosis and adequate treatment of the occupational disease and injuries. Secondary prevention attempts to arrest the disease process, restore health by seeking out unrecognised diseases and treating them before irreversible pathological changes take place, and reverse communicability of infectious diseases.

2.9.2.2.1 Elimination or substitution

Eliminating hazards and controlling risks at the source are the most effective preventive interventions for the protection of workers' health, and therefore evaluation should take place to determine whether this outcome is feasible (GOHNET 2007:3). It focuses on removing the hazard, thereby eliminating the risk. Such measures also include integrated management of chemicals at the workplace, elimination of updated machines from all wood workplaces, improved occupational safety, and health-impact assessment of new technologies, work processes and products at the design stage.

Substitution focuses on replacing the hazard with something less hazardous, thereby reducing the risk. Dangerous substances, processes and machines should be systematically replaced by less hazardous ones (GOHNET 2007:3). It is a hazard control strategy in which a material or process is replaced with another that is less hazardous. Substitution is the second most effective on the hierarchy of hazard controls in protecting workers, after elimination.

2.9.2.2.2 Engineering control

Engineering consist of various measures for reducing a hazard at its source or for separating personnel from the hazard. When substitution is not feasible, the exposure to occupational hazards should be properly controlled through engineering measures designed to reduce exposure (GOHNET 2007:3). For example the installation of

machine guards on a tool and die stamping machine, setting up of local exhaust ventilation to remove toxic gases before they reach the worker, installing noise buffers on noisy equipment (Burton 2010:84). It is of paramount importance that any engineering control, be well designed, properly installed and operated, routinely checked and well maintained. Otherwise it will not be efficient and may even give an undesirable “false sense of security” (GOHNET 2007:4). The initial cost of engineering controls can be higher than the cost of administrative controls or PPE, but over the longer term, operating costs are frequently lower, and in some instances, can provide a cost saving in other areas of the process.

2.9.2.2.3 Administrative controls

Administrative controls such as policies on staff assignments and rotation, and work practice controls are the next level of control. Administrative controls do not eliminate hazards but create a situation that is favourable for the reduction of work-related injuries and diseases (Burton 2010:84). The practices that can effectively reduce some occupational mishaps include worker rotation on a job (Gupta 2013:687), monitoring and minimising the duration of exposure to a risk or hazard, improvements in the immediate working environment, and ergonomic enhancements. Administrative controls are more efficient than PPE because they involve some manner of prior planning and avoidance, while PPE only serve as a final barrier between the hazard and worker.

Generally, administrative controls are cheaper to begin, but they may become more expensive over time as higher failure rates and the need for constant training or re-certification often eclipses the initial investments of the three more desirable hazard controls in the hierarchy. There appeared to be low administrative controls in the wood processing enterprises in Ghana because it appeared most managers perceived injured workers’ replacement as an easy option, and that insurance cover for injury was a sufficient protection for their workers and enterprises (Adei & Kunfaa 2007:165). In addition, they also perceived occupational hazards in the work place to be normal with their operations and therefore lacked the commitment to ensure safe and healthy practices (Adei & Kunfaa 2007:165).

2.9.2.2.4 Personal protective equipment (PPE)

Personal Protective Equipment (PPE) include any protection worn by a person to protect them from a hazard, for example, the use of respirators (masks) by employees working in dusty conditions (Burton 2010:85). Personal protective equipment should be used only as a last resort to protect workers from exposure to hazards that cannot be eliminated or minimise using other means (Reinhold & Tint 2009:72). To make sure the right type of PPE is chosen, the different hazards in the workplace have to be identified, considered and the right PPE that will provide adequate protection against them provided; this may be different for each job. Woodworking exposes workers to a variety of hazards, including kickbacks, flying wood chips, noise, wood dust, and chemical hazards. Personal Protective Equipment (PPE) can be used as the last line of defence alongside other control measures to help protect against these hazards (WorkSafeBC 2013:17). According to Adei and Kunfaa (2007:165), personal protective equipment (PPE) namely: safety boots, overall coat, nose masks, ear protectors, goggles and gloves were the main measure adopted to mitigate the effect of hazards in all the Wood processing industries in Ghana. Following is a brief description of each:

(i) Nose mask or respirator

A nose mask is a flexible pad held over the nose and mouth by elastic or rubber straps to protect against dusts encountered during woodworking activities. Respirators provide protection from exposure to particles, including small dust and chemicals (WorkSafeBC 2013:18).Workers must be equipped with the right respirator and type of cartridge for the job. For example, woodworking typically requires an elastomeric half-face respirator with P100 cartridges, minimum for adequate protection. Fit-tests and a seal check are done whenever the respirator is put on to ensure it proper fitness and adequate protection (WorkSafeBC 2013:18). A respirator programme is required any time respirators are used in the workplace to ensure that workers use and care for respirators correctly.

(ii) Protective clothing or overall coat

Close-fitting clothing helps prevent wood dust and debris from working its way under the clothing. Padded or heavy leather bib aprons, long sleeves, and long pants are worn to

help protect the body from lacerations, abrasions, kickbacks, and other impacts with materials (WorkSafeBC 2013:18). Roll long sleeves up above the elbow, keeps the clothes clean and prevent the clothing from getting caught in the tool and never wear loose necklaces or jewellery when operating woodworking equipment. Remove rings to prevent fingers from being caught in the moving equipment. Long hair should be tied back so it cannot hang over the tool. Nevertheless, their use should be guided by the type of hazard, the type of fabric, carrier characteristics and external factors, such as temperature and chemical factors (Walker 2010:30).

(iii) Ear plug

Earmuffs are equipment worn to prevent hearing loss. The noise levels produced by most power woodworking equipment are high enough to damage hearing. For example, table saws produce 87-94 dBA above the recommended sound levels of 85 decibels. Levels of 85 dBA or more for an average eight hours of exposure are known to cause hearing loss (WorkSafeBC 2013:18).

2.9.2.3 Tertiary prevention of occupational hazards in wood workplaces

Tertiary prevention is directed at individual assistance in dealing with consequences of occupational hazards; the lowest level of prevention focused on the prevention of escalation of the impacts that have already occurred (Work safe Alberta 2011:29). It includes mainly the rehabilitative and return-to-work (RTW) measures.

2.9.2.3.1 Rehabilitation and return-to-work (RTW) measures

According to Skivington, Lifshen and Mustard (2016:615), most organisations have high rates of sickness absence and poor levels of return to work following absence because the organisations do not have explicit policies and procedures for supporting those on sick absence to return to work. Even though, safe and sustainable return to work (RTW) after sickness absence is a challenge, early RTW is promoted because it encourages recovery and reduces absence time, which makes it less likely that workers will move on to disability benefits, and is therefore associated with lower societal costs as well as lower compensation costs for the employer (Skivington et al 2016:613).

It is therefore important for organisations to have comprehensive RTW processes. There exists a guideline for workplace-based strategies for RTW developed by Gensby, Lund, Kowalski, Saidj, Jørgensen, Filges, Irvin, Amick III and Labriola (2012:6) to help employers with workplace disability management programmes to promote workers' return to work. The guidelines provides an overview of potential constructions and contents for organisations to encompass an in-house approach and model for managing RTW following work disability with respect to the company's resources and size (Gensby et al 2012:82). In addition, the guidelines reveal that even though smaller companies may have better access to elements in the interpersonal and administrative work environment, they lack the capacity and resources to provide in-house arrangements throughout the RTW process. Thus, the narrative descriptions regarding the contents of workplace disability management programmes described in the guideline may be useful for those smaller organisations that aim to build a reliable workplace disability management programme while relying on external disability counsellors and onsite rehabilitation services (Gensby et al 2012:82).

2.10 CONCLUSION

This chapter has reviewed multi-dimensional literature from relevant studies. It started by describing the socio-demographic characteristics of small scale and informal woodworkers, legislative frameworks and findings on the knowledge and practices of workers in small-scale and informal wood enterprises. The relevance of compliance with occupational health and safety legislation has also been synthesised. It also features the nature and magnitude of work-related injuries and diseases amongst workers in these enterprises. Lastly, it has paid due attention to the occupational health and safety conditions and health and safety interventions needed to prevent occupational hazards in small-scale wood enterprises. The following chapter presents the theoretical framework of the research.

CHAPTER 3

THEORETICAL FRAMEWORK OF THE RESEARCH

3.1 INTRODUCTION

This chapter outlines the World Health Organization Healthy Workplace Framework and Model (WHOHWFM) as a theoretical framework (Burton 2010:82) that supports and provides a foundation for the current study. The chapter also defines a healthy workplace and explains the avenues of influence for a healthy workplace and the core principles of the model. The WHOHWFM serves as a universal practical manual that can be adapted by all workplaces irrespective of the size or country to promote healthy and safe culture at workplaces. The elements of the framework can equally be used by employers in the informal setting and applied to workers in unofficial ways if necessary in order to improve their health and safety at work, which is the output of the study.

The WHOHWFM is the underpinning for the present study due to its relevance and role in advocating for occupational health and safety for workers globally and across all sectors. The WHO model and framework outlines brings together the principles and common factors within the physical and psychosocial work environments that appear to be supported across the world and in the perceptions of experts and practitioners in the fields of health, safety and organisational health (Burton 2010:1).

This study set out to reveal the OHS challenges that are faced by small scale informal workers in woodworking enterprises and to seek ways to improve the health and safety culture at work. The main aim is to foster the quality of work life among woodworkers especially those working in the small scale and informal sector where injury rates have been reported to be high. This framework and model therefore offer an applicable base to study challenges faced by these woodworkers in the Fako division of Cameroon.

3.2 THEORETICAL FRAMEWORK SUPPORTING THE CURRENT STUDY

The WHO's Healthy Workplace Framework and Model was developed by Joan Burton in 2010 primarily to provide some practical guidance to occupational health and/or safety professionals, scientists, and medical practitioners to provide the scientific basis for a healthy workplace framework. It suggests a flexible, evidence-based framework for healthy workplaces that can be applied by employers in collaboration with workers regardless of the sector or size of the enterprise, the level of development, regulatory or cultural background of the country (Burton 2010:1).

The word "framework" in the WHOHWFM is used to describe the key principles and an interpretive explanation of the suggested model for healthy workplaces. While "model" is used to describe the abstract representation of the structure, content, processes and system of the healthy workplace concept (Burton 2010:1). The model contains both the content of the issues that should be dealt with in a healthy workplace and the process that will ensure success and sustainability of healthy workplace initiatives as shown in figure 3.1 (Burton 2010:1).

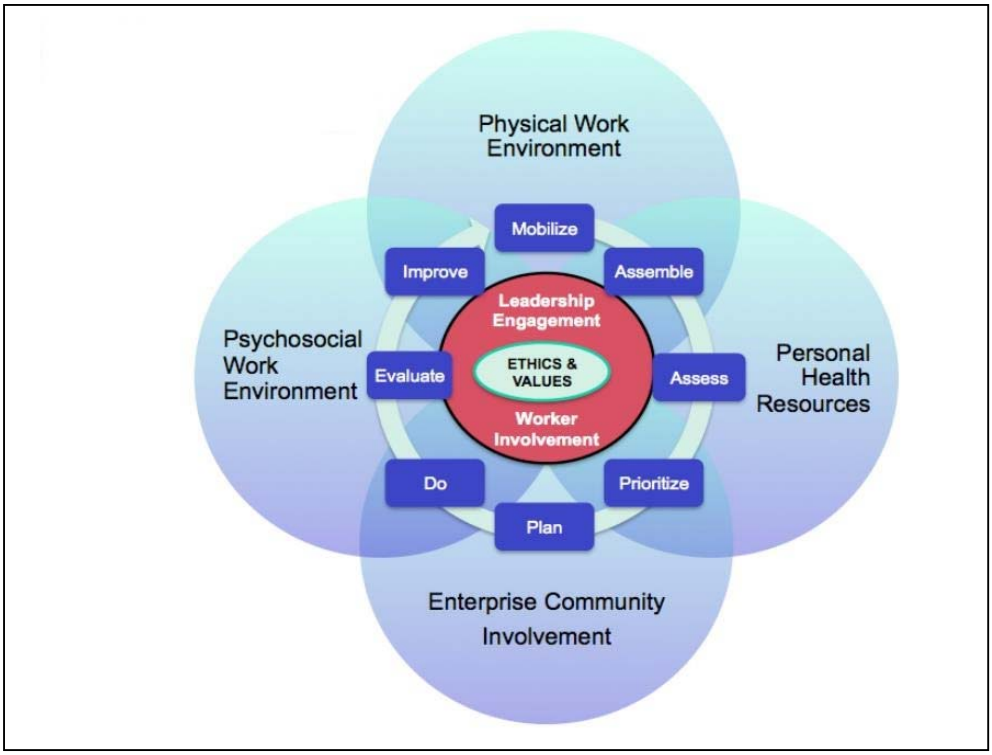

Figure 3.1 The WHO Healthy Workplace Framework and Model: Avenues of influence, process and the core principles

(Burton 2010:98)

3.2.1 Definition of a healthy workplace

Many definitions exist for a healthy workplace and all of these definitions take into consideration the WHO's definition of health as "a state of complete physical, mental and social wellbeing, and not merely the absence of disease" *(*WHO 2014:1). Even though, various definitions are stated in different ways depending on the author, all the definitions emphasise more on the physical and mental well-being of employees. The WHO Regional Office for the Western Pacific's definition of a healthy workplace which is adopted for the study states that:

"A healthy workplace is a place where everyone works together to achieve an agreed vision for the health and well-being of workers and the surrounding community. It provides all members of the workforce with physical, psychological, social and organisational conditions that protect and promote health and safety. It enables managers and workers to increase control over their own health and to improve it, and to become more energetic, positive and contented" (Burton 2010:15).

3.2.2 The components of the WHO Healthy Workplace Framework and Model (WHOHWFM)

The WHOHWFM contains the avenues of influence for a healthy workplace, continual improvement process and the core principles. The four avenues of influence which are the core principles of a healthy workplace are discussed forthwith.

3.2.2.1 Avenues of influence for a healthy workplace

The four avenues that influence a healthy workplace include: (i) the physical work environment, (ii) the psychosocial work environment, (iii) personal health resources in the workplace and (iv) enterprise community involvement (Burton 2010: 83). These are four ways that an employer working in collaboration with employees can influence the health status (the complete physical, mental and social well-being) of not only the workers but also the enterprise as a whole, in terms of its efficiency, productivity and competitiveness. These four areas relate to the content of a healthy workplace

programme, not the process. The four avenues outlined above are vital to the framework of our study and was described in detail.

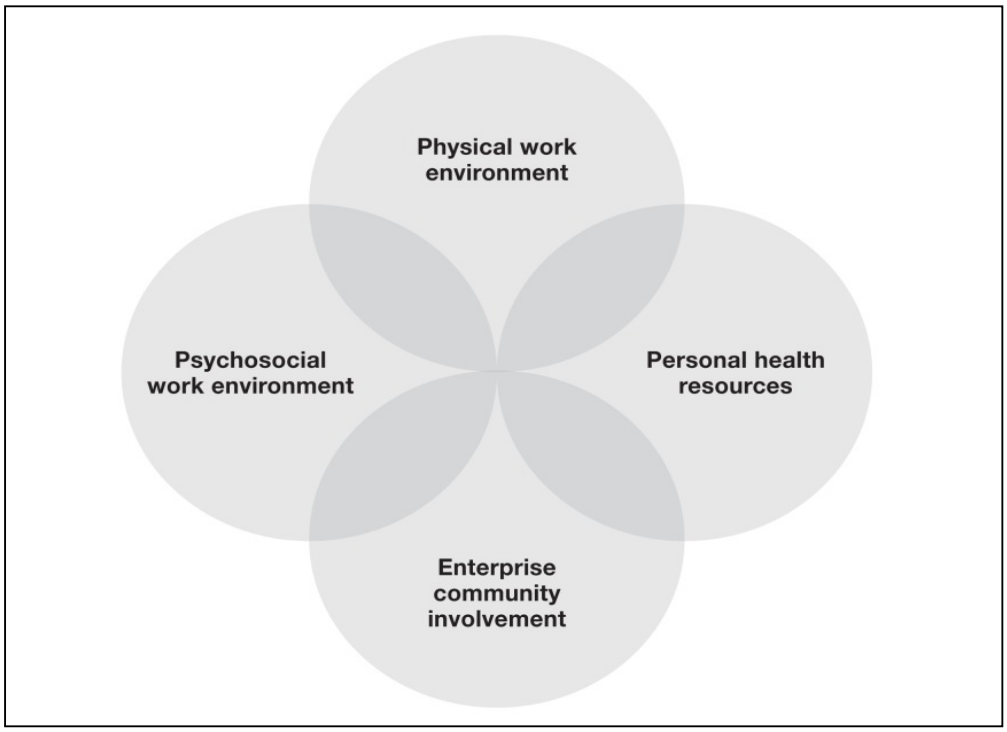

Figure 3.2 The WHO four avenues of influence

(Burton 2010:83)

3.2.2.1.1 The physical work environment

Physical work environment is defined in the WHOHWFM as the part of the workplace facility that can be detected by human or electronic senses, including the structure, air, machines, furniture, products, chemicals, materials and processes that are present or that occur in the workplace, and which can affect the physical or mental safety, health and well-being of workers (Burton 2010:84). The physical working environment of the employee includes the overall health and safety of the workers including the identifiable workplace, causes of accidents and illnesses. It consists of physical conditions and exposures constitute (such as production or use of certain chemicals, exposure to smoke, dust, fumes, production using technical equipment and machinery work) a central part of work wellbeing that affects employees' psychosocial and physical health (Foldspang, Michael, Rants, Hjorth, Langholz-Carstensen, Poulsen, Ulf, Ahonen & Aasaess 2014:16). Physical work environment for woodworking workplaces are either indoors or outdoors depending on where the workers choose to perform their task. They

might be exposed to physical, biological, chemical and ergonomic hazards that prevail in the physical work environment (Burton 2010:84).

Physical hazards

Physical hazards are hazards that arise at a work due to the influence of various forms of energy and generally perceptible and discernible (Mittlestaedt et al 2000:1). Examples of physical hazards that may pose dangers to workers include: noise, vibration, unhealthy microclimatic, electrical hazards, falls from heights (Burton 2010:84) slips, trips and falls. Slips, trips and falls result in a variety of injuries. Woodworkers may be frequently exposed to hazards such as narrow walkways with obstacle which can cause workers to trip and fall resulting in serious injury and electrical sparks from poorly insulated hand-held sanders leading to electrocution. Workers working in woodshops; which are the setting of the currents study are mostly exposed to physical hazards such as noise, vibration, inadequate lighting and extreme temperatures (Osagbemi et al 2010:327; Steven 2012:280).

Chemical hazards

Chemical hazards refer to health hazards caused by hazardous substances, compounds and particles which may present an immediate or long term injury or illness to people (Safe Work Australia 2012:4). According to Burton (2010:84), chemical hazards in most workplaces results from exposure to solvents, pesticides, asbestos, carbon monoxide, silica and tobacco smoke. In the woodworking workplaces, exposure to large quantities respirable wood dust or chemical compounds like phenol formaldehyde and terpenes used in wood enterprises can lead to a variety of respiratory tract, cancers and skin diseases (Effah et al 2013:126; Rongo & Leon 2005:32).

Biological hazards

Biological hazards, also known as biohazards, are organic substances that pose a threat to the health of humans and other living organisms. They include: pathogenic micro-organisms, viruses, toxins (from biological sources), spores, fungi, bioactive substances and can also include biological vectors or transmitters of disease (Safe Work Australia 2011:1). The WHOHWFM refers to biological hazards as hazards

resulting from exposure to biological agents such as mould, pandemic threats, food or water-borne pathogens, lack of clean water, toilets and hygiene facilities. Examples of biological hazards at woodworking workplaces include woodworkers' exposure to moulds, amounts of spores and mycelia fragment of fungi that grows on stored wooddust, planks and chips may cause strong antibody responses and respiratory disorders or organic dust toxic syndromes.

Ergonomic hazards/manual handling hazards

Ergonomic hazards, as described by the WHOHWFM in Burton (2010:84) are hazards resulting from the use of excessive force, awkward posture when working, performing repetitive work, heavy lifting of load and engaging in activities that lead to prolonged static postures. The work of a woodworker in the wood industry necessitates bending awkwardly to push and lift heavy logs of planks onto the work table and maintaining the same standing position for hours to plan and sandpaper the wood with the head bent downward.

Mechanical hazards

Mechanical hazards are created as a result of either powered or manual (human) use of tools, equipment or machinery and plants. Examples of mechanical hazards are related to nip points, cranes, forktrucks (Burton 2010:84). Mechanical hazards occur in three basic areas: at the point where work is performed, in the power transmission apparatus and in other moving parts. In the woodshop, the action of moving parts of the working equipment such as bandsaw, planer, hand-held sanders and table saws may have sufficient force in motion to cause injury to woodworkers.

Hazard control of physical work environment hazards

According to Burton (2010:84), potential hazards within a physical work environment can cause illnesses and injuries and thus must be hazard identification and risk assessment (HIRA) and controlled through a hierarchy of controls that include elimination or substitution, engineering controls, administrative controls and personal protective equipment, preferably in that order. Hierarchy of controls involve the process to identify control options, select controls, develop and update a hazard control plan,

select controls to protect workers during non-routine operations and emergencies, implement selected controls in the workplace and follow up to confirm that controls are effective. Effective controls protect workers from workplace hazards; help avoid injuries, illnesses, and incidents; minimise or eliminate safety and health risks; and help employers provide workers with safe and healthful working conditions.

(i) Elimination (including substitution)

This involves the complete removal of the hazard from the workplace, or substitution (replacement) of hazardous materials or machines with less hazardous ones. For example, the regular removal of wood dust from the floor removes sources of mould in the woodshop.

(ii) Engineering controls

This includes designs or modifications to plants, equipment, ventilation systems, and processes that reduce the source of exposure. For instance in a woodshop, the installation of machine guards on a tool and die stamping machine, setting up of local exhaust ventilation to remove toxic gases and wood dust before they reach the woodworker and the installation of noise buffers on noisy equipment can greatly reduce injury among woodworkers Burton (2010:84).

(iii) Administrative controls

These are controls that alter the way the work is done, including timing of work, policies and other rules, and work practices such as standards and operating procedures (including training, housekeeping, and equipment maintenance, and personal hygiene practices). In woodshops, ensuring good housekeeping such as proper packing of planks prevents hits from falling objects while regular cleaning of the floor removes projecting objects like nails that can pierce workers thus resulting in injury. The rotation of workers is also a housekeeping measure that can reduce workers' exposure to hazardous environments for a longer period (Burton 2010:85).

(iv) Personal protective equipment

This involves equipment worn by individuals to reduce exposure such as contact with chemicals or exposure to noise. The provision and use of PPE must be based on a risk assessment. It is necessary that provision of PPE should consider the sizes and configurations that fit women as well as men (Burton 2010:85). In the context of the present study, employers are compelled by Section 1 (2) of Cameroon OHS Order No. 039/MTPS/IMT to provide PPEs to employees to reduce exposure to hazards. PPEs such as respirators (masks) to prevent breathing in of wood dust; gloves to protect hands from hazardous chemicals such as wood dust and paint, rough or sharp; boots to protect workers' feet from sharp objects such as nails; and earplugs to protect the ear against loud noise.

3.2.2.1.2 The psychosocial work environment

The psychosocial environment is related to interpersonal and social interactions and is defined by the set of psychological, cognitive, and behavioural phenomena of work environment that influence behaviours, feelings, and thoughts of workers, (Gyawali 2015:1). These are generally referred to as workplace stressors, which may cause emotional or mental stress to workers (Burton 2010:85). Examples of hazards in the psychosocial woodwork environment include:

Poor work organisation

Poor work organisation is described as the way job and work system are designed and managed that can cause stress (Leka et al 2003:5). The WHOHWFM proposes that poor work organisation occurs when there is excessive and unmanageable workload and pressure, decision latitude, reward and recognition does not match work done, there is little support from supervisors and colleagues, and little opportunity to exercise any choice or control (Burton 2010:85). The current study assessed the impact of workload and pressure on injury rate among woodworkers working in the small-scale woodshops in the Fako division of Cameroon

Organisational culture

Organisational culture is reflected in the attitude of staff, their shared beliefs about the organisation, their shared value system and common and approved ways of behaviour at work (Leka et al 2003:23). It also concerns how problems are recognised and solved. They include lack of policies and practice related to dignity or respect for all workers, harassment and bullying, discrimination on the basis of health status, lack of support for healthy lifestyles (Burton 2010:85). Employers, workers and trade union representatives need to engage in culture changes activities as an important aspect of improving the management of stress at work.

Inconsistent application and protection of basic worker rights

The WHOHWFM states that inconsistent application and violation of basic workers' rights involves work practices that do not comply with legislated employment standards. This includes the non-issuance of standard legislated employment contracts and annual leaves to workers, the non-respect of maximum working hours per day, the non-respect of occupational health and safety rights etc. (Burton 2010:85). The present study investigated the impact of working hours on injury rates among wood workers in Fako division of Cameroon and has proposed ways of improving these practices.

Hazards control in the psychosocial work environment

The WHOHWFM proposes that hazards in a *psychosocial work environment* should be addressed in the same way as physical hazards, though they are assessed with different tools such as surveys or interviews rather than inspections. The hazards should be recognised, assessed and controlled through a hierarchy of controls that seek to eliminate the hazard if possible or modify it at the source. For instance, reallocation of work to reduce workload, removal or retrain managers/supervisors in communication and leadership skills; enforce zero tolerance for harassment, bullying or discrimination in the workplace and allowing flexibility to deal with work-life conflict situations can eliminate or modify workload (Burton 2010:85).

3.2.2.1.3 Personal health resources in the workplace

The WHOHWFM suggests that the provisions of personal health resources in the workplace can support or encourage worker efforts to improve their personal health practices or lifestyle, as well as monitor and support their physical and mental health (Burton 2010:86). Such resources include health services, training, financial support, information, opportunities, and flexibility. Although work can get in the way of making healthy lifestyle choices, motivated and innovative employers do what they can to remove the barriers and support the personal health goals of their employees (Stoewen 2016:1189). Examples of personal health resource issues in woodshops may include lack of knowledge that may make it difficult for workers to adopt healthy lifestyles or remain healthy. Another issue is poor diet which may be caused by lack of access to good restaurants or meals at work, lack of time to take breaks for meals and lack of refrigeration to store preservable foods. Also, lack of accessible and/or affordable primary health care may cause illnesses among woodworkers to remain undiagnosed or untreated.

3.2.2.1.4 Enterprise community involvement

Community involvement refers to the ways in which a workplace goes above and beyond to involve itself within the community in which it operates, offering expertise and resources to support the social and physical wellbeing of the community (Burton 2010:87). Activities that positively influence the physical and mental health, safety, and well-being of workers and their families offer the greatest advantage. Examples in the current study include the offering of knowledge about OHS workers, healthcare services to workers and their families, spearheading a community project and volunteering in community initiatives such as .general cleaning campaigns.

3.2.3 Core principles of a healthy workplace

According to the WHOHWFM, the core/key principles for creating workplaces that are healthy for employees and prevent illnesses and diseases are leadership, commitment and engagement; ethics and values; and involvement of workers and their representatives (Burton 2010:62).

Leadership commitment and engagement

The WHOHWFM suggests that in order to create a healthy workplace, it is important to mobilise and secure commitment from major stakeholders or authorities concerned since a healthy workplace programme must be integrated into the business goals and values of the enterprise (Burton 2010:62). It equally advocates for the creation of a comprehensive policy that is signed by the enterprise's highest authority and communicated to all workers and which clearly indicates that healthy workplace initiatives are part of the organisation's business strategy. In the current study, the researcher assessed the elaborated OHS policy and compliance with the requirements of health and safety legislation in small-scale woodshops in Fako division of Cameroon.

Ethics and values

Every major religion and philosophy since the beginning of time has stressed the importance of a personal moral code to define interactions with others. One of the most basic universally accepted ethical principles is to "do no harm" to others and to ensure employees' health and safety at the workplace (Burton 2010:5). Employers are expected to adhere to workers' social and ethical codes as part of their role in the broader community and enforce occupational health codes and laws at the workplace. Employers also need to be responsible for workers, their families and to the public and avoid undue risks and human suffering. It is a fundamental human right for all workers to work in a safe and healthy work environment. The current study probed into the working condition and magnitude of work-related injuries of woodworkers in small-scale wood enterprises in the area of study.

Involving workers and their representatives

One of the most consistent findings of effectiveness research is that for successful programmes, the workers affected by the programme and their representatives must be involved in a meaningful way in every step of the process, from planning to implementation and evaluation (Burton 2010:62). Workers and their representatives must not simply be "consulted" or "informed" but must be actively involved in every step of the risk assessment and management process from planning to evaluation and their opinions and ideas considered. It is critical that workers have some collective means of

expression due to the power imbalance that exists in most workplaces between labour and management. The research assessed the availability of qualified safety representatives and health and safety committees and their involvement from planning to evaluation of health and safety programmes.

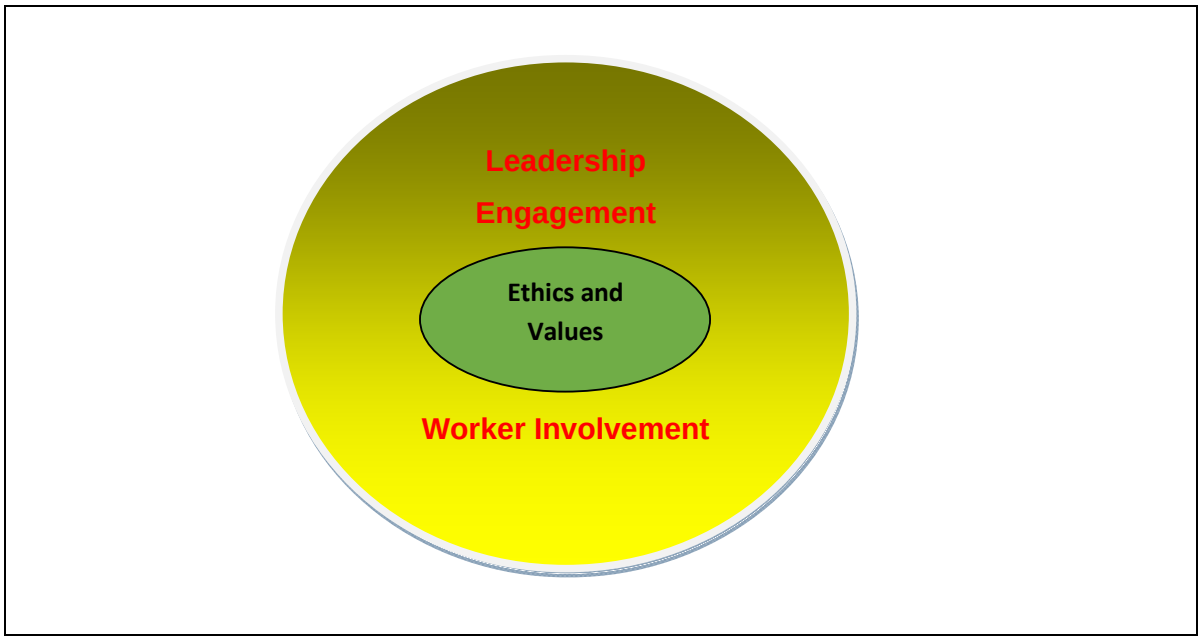

Figure 3.3 The WHO core principles

(Burton 2010:98)

3.3 CONCLUSION

The chapter presented the World Health Organization Healthy Workplace Framework and Model (WHOHWFM) as a theoretical framework that supports and provides a frame for the current study. The chapter has equally shed light on what a healthy workplace is and described the avenues of influence for a healthy workplace and the core principles of the model in relation to creating a healthy and safe environment for workers. The next chapter describes the methodology which is the approach which was taken to execute the study.

CHAPTER 4

RESEARCH DESIGN AND METHODOLOGY

4.1 INTRODUCTION

This chapter details the research methods and processes adopted in this study. The chapter also describes the study setting of the current study, and explains the sampling procedure and data collection tools used to obtain data from respondents. Furthermore the chapter explains the data analysis method used and raises issues pertaining to the validity and reliability of this study. Ethical considerations relevant to the study are also explored.

4.2 RESEARCH DESIGN

The research approach used in this study was a quantitative, cross-sectional descriptive and contextual design. This was adopted to explore the nature and magnitude of OHS challenges, and to identify risk factors associated with self-reported injury rates among woodworkers in Fako division. A structured interviewer-administered questionnaire and a checklist were the two types of structured data collection methods used to collect and record data from respondents. While the structured interview data collecting tool was used to conduct workplace interviews by directly interviewing the woodworkers from identified woodshops, the checklist was used to conduct environmental surveys/inspections of the working conditions in the study sites to ascertain if they met the minimum OHS standards. The present study met the criteria of an exploratory study because it enabled the gaining of new insights and discovery of new ideas (Burns & Grove 2009:359).

The cross-sectional design was used based on the fact that data collection was done at one point in time, without having to follow-up subjects at a later stage (Amin 2005:212; Creswell 2012:377). The use of the design also enabled a measure of the injury or disease burden among woodworkers and the distribution of certain exposures (Friis & Seller 2004:218). A cross-sectional study was chosen because it could examine current knowledge and practices among the study population (Creswell 2012:377). Besides, it

being simple and inexpensive, it is popular due to its usefulness, efficiency and generalisability (Creswell 2012:381).

The study used an descriptive design given that it was concerned with the identification of determinants or risk factors of injuries/diseases, the reasons for relatively high or low frequency of injuries/disease among woodworkers and to generate new hypotheses (Friis & Seller 2004:567). This study met the criteria of a contextual study because data were collected within the natural setting of the woodworkers' workplace and free from manipulations (Burns & Grove 2003:32).

4.2.1 Quantitative research

The researcher identified the quantitative approach as the most appropriate for this study. In addition, the quantitative approach was adopted in this study because it is typically used to describe and examine relationships as well as determine causality among variables. The study also included logistic and deductive reasoning as the researcher examined particulars to make generalisations about the universe. It was characterised by the use of structured interviews for workers and designed checklist for environmental surveys and measures that generated numerical data. Statistical analyses were carried out to condense and categorise data generated, describe variables, examine relationships and determine differences among groups of respondents. Precise statistical analyses were used to ensure that the research findings accurately reflect reality so that findings from the study can be generalised (Grove, Burns & Gray 2013:25).

4.3 RESEARCH METHOD

4.3.1 Study setting

The study was conducted in Fako division, one of the six divisions that make up the South West Region of Cameroon. It borders the Atlantic Ocean and encompasses the densely settled current population of 444,269 inhabitants and a population density of 216 persons per square kilometre (Orock & Lambi 2014:41). It consists of six administrative units: Buea, Limbe I, Limbe II, Limbe III, Tiko, Muyuka and Idenau (figure 4.1). This area is the economic backbone of the south west region with six major towns

(Muyuka, Buea, Tiko, Mutengene, Limbe and Idenau) of the region located in this division.

The reason for the choice of this division is the fact that over 80% of the small-scale processing enterprises in this location deals with wood; re-sawing or furniture making or integrated wood activities. This area was also selected for the study because no previous study had been carried out here to find out the OHS challenges faced by woodworkers in small scale and informal enterprises. The largest concentration of woodshops are located in Muyuka, Buea, Ekona, Mutengene and Tiko areas due to the high human population, the availability of timber as well as the current high demand for wood products in the booming building construction industry. The current survey of small scale wood workshops was carried out in Muyuka, Buea, Ekona, Mutengene and Tiko because the increased economic activities may tend to affect the woodworking activities and its workers' challenges.

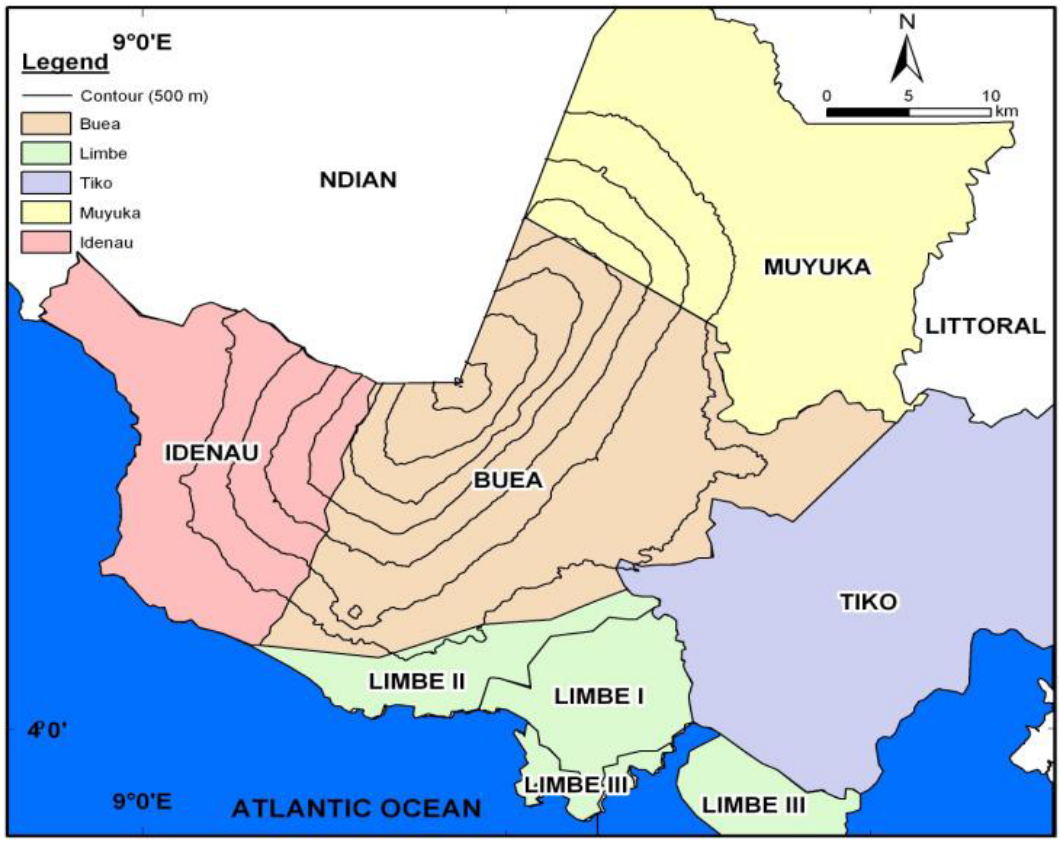

Figure 4.1 The study area (Fako division) showing its different administrative units

(Orock & Lambi 2014:41)

4.3.2 Study population

The target population for this study included all the workers in the 88 woodshops engaged in small scale and informal woodworking activities in Fako division. The sample included all (223) workers present at the site and willing to participate in the study.

4.3.3 Sampling

Sampling was defined in the current study as the process of selecting a proportion of the small scale woodworking population to represent the entire population (Burns & Grove 2009:343). Snowball sampling of all informal small-scale wood processing industries in the Fako area in Cameroon was used to recruit respondents. This snowball sampling method was used by the researcher to identify potential woodworkers working in small and informal woodshops because they were hard to locate given the lack of any database as most of them are presumably unregistered given their informal nature. Secondly, the sampling process is relatively cost effective, since additional sample respondents could be found in the same site.

4.3.3.1 Sample size and sample characteristics

The sample comprised all woodworkers present at the site during data collection process and who were willing to participate in the study, of various categories including apprentices, temporary workers, permanent workers and working-owners. A total of 223 woodworkers across the 88 wood workplaces were recruited to participate in the study.

4.3.4 Data collection

4.3.4.1 Data collection methods

A structured interviewer-administered questionnaire for woodworkers and a structured inspection checklist were the two types of data collection tools used to collect and record data for this study. While the structured interview data collecting tool was used to conduct workplace interviews by directly interviewing the woodworkers from identified woodshops, the designed checklist was used to conduct environmental

surveys/inspections of the working conditions in the study sites to ascertain if they met the minimum OHS standards.

4.3.4.2 Development of data collection tool

The structured questionnaire for the woodworkers was developed based on the components of the theoretical framework used to underpin the current study, findings from the literature reviewed, and the objectives of the study. The interview questions were mainly close-ended questions and adapted from the publications of renowned journals and international organisation on related topics. The structured questionnaire was meant to solicit in-depth information relating to woodworkers' knowledge of health and safety concepts, rules and responsibilities, compliance with the requirements of health and safety legislation, and to assess the nature and magnitude of work-related injuries and diseases.

Secondly, the inspections checklist was adapted from the International Labour Organization's checklist for conducting health, safety and working condition inspections. A modified checklist was deemed necessary because the one used by the ILO does not focus on areas relevant to the present study. Moreover, the checklist was developed after a thorough review of other relevant publications made in reputable journals and guided by the reviewed feedback of the researcher's supervisors. The checklist was finally validated by the research supervisors who are experts in the OHS domain.

4.3.4.3 Characteristics of the data collection tool

4.3.4.3.1 The structured Interviewer-administered questionnaire

The structured Interviewer-administered questionnaire comprised three sub-sections namely: the socio-demographic characteristics, knowledge and practice of health and safety, and nature and magnitude of work-related injuries and diseases.

Section 1 consisted of socio-demographic data with seven main items which included respondents' age, sex, educational level, medium of training, work experience, job category and working hours in the woodworking sites.

Section 2 assessed the Knowledge and practice of OHS at work. The knowledge of OHS among woodworkers was assessed using 16 questions divided into three sub-sections: (i) Knowledge relating to OHS concept and training, (ii) Knowledge about the use and benefits of using PPE and (iii) knowledge of woodworking equipment and maintenance thereof. Meanwhile, the respondents' practices regarding OHS at work were also evaluated using16 questions grouped into four sub-sections: (i) respondents' OHS training practices, (ii) respondents' practices relating to the provision and use of PPE, (iii) respondents' OHS practices relating to work equipment and maintenance and (iv) respondents' practices relating to the housekeeping aspects.

Section 3 was based on the nature and magnitude of work-related injuries and diseases which included the nature of injuries experienced by respondents, body location of work-related injuries, treatment received for occupational injuries and sources of occupational injuries at workshops.

4.3.4.3.2 Checklist for inspection of compliance with occupational health and safety (OHS) policy

The checklist was used to collect data which assessed OHS policy compliance at woodshops as recommended by Cameroon OHS order No. 039/MTPS/IMT of 26 August 1984. The overall compliance with OHS control measures were scored using the ratings from observations and inspection of the relevant documents and indicated by means of *"Yes or No"* entries. The checklist was divided into five sub-sections, namely:

(i) Workplace conditions
(ii) Occupational health and safety training
(iii) Personal protective equipment provision
(iv) The state of work equipment and maintenance
(v) Housekeeping aspects
(vi) Manual handling/Ergonomic hazards

The questionnaire originally developed in English language was translated into the French language for French speakers.

4.3.4.4 Data collection process

First of all, permission was sought and granted by appropriate authorities concerned and these included: the University of South Africa Health Studies Higher Degrees Committee and the South West Regional Delegation of Public Health Cameroon. The data collection process had two phases described below:

The first phase included administering the structured interviewer-adminstered questionnaire to woodworkers working in small scale woodshops in Fako division. Each workshop was visited by the researcher and two research assistants starting with sites locate in Tiko, then to Mutengene, Buea, Ekona and Muyuka. We spent averagely four days per study area. Once we identified a site, we sought for permission from the management of the woodshop, we explained the purpose of our research to workers and only respondents who signed the consent forms on the front page of the questionnaire were interviewed. All the interviews were held in the various woodshops and each interview session lasted approximately 20 minutes. The questionnaires were again cross-checked at the end of the day to ensure all necessary information was correctly collected by the researcher. The data collection for this study was done from the 4th to 30th of July 2016.

In the second phase, the nature of the working conditions of 88 sites was inspected by the researcher using a checklist and an observation tO elicit information about employers' compliance with health and safety regulations and responsibilities (Cameroon OHS Order 039/MTPS/IMT of 26 August 1984). Pictures of important aspects observed that demonstrate the environmental conditions, infrastructural and current practices in the study sites were taken. Document examination was also conducted to review incident reports, training records, documentation on the availability of qualified safety representatives and health and safety committees, meetings held, records of risk assessments, review of the health and safety policy as well as a review of reports from previous inspections. The employers or site heads assisted in providing the required data from the study sites and it took the researcher approximately half an hour to complete an inspection session per site. The data collection steps were implemented in all surveyed sites.

The questionnaire translated into French language was translated back to English for analysis.

4.3.4.5 Pre-testing of the research instrument

In order to check the questionnaire for clarity of its general content, content validity and thoroughness, the researcher conducted a pilot study on twelve respondents recruited from three workshops who met the selection criteria in Mfoundi division located in the Centre Region of Cameroon. This was not to lessen or reduce the number of respondents given that they were not many respondents in the area of interest. Feedback received from the results of the pilot study was then incorporated in the final survey instruments.

4.3.4.6 Ethical considerations

The involvement of human subjects in a study calls for complete and careful protection of the rights of the humans (Polit & Beck 2004:141). Ethical analysis should reflect both internationally accepted norms and locally relevant cultural values (WHO 2009:19). It was the moral obligation and responsibility of the researcher to strictly consider the rights of the woodworkers who provided the data required for the current study. The ethical issues observed in this study included respect for respondents, voluntary participation, obtaining informed consent, beneficence and non-maleficence, justice, anonymity, confidentiality and privacy and obtaining permission from study sites.

4.3.4.6.1 Respect for respondents

In the present study, respondents made an informed voluntary decision to participate in the research by signing the written consent form after satisfactory explanation of the information contents of the research and all their questions satisfactorily answered prior to the interview. The right of self-determination was respected at all times; all respondents were informed of their complete right to withdraw from the study at any time without any explanation, and without negative consequences.

4.3.4.6.2 Voluntary participation

The researcher ensured that no respondent was pressurised or forced to participate in the study. Thus, participation in the studies was fully voluntary. The researcher explained in detail the aim of the study to all respondents and all questions were satisfactorily understood and answered by all respondents before the signing of the consent form. The respondents were given enough time to reflect on whether to accept to take part in the study or not.

4.3.4.6.3 Obtaining informed consent

Participation in this research was voluntary and predicated on informed choices (Grove et al 2013:171; Department of Health 2015:16). A written permission or informed consent was also obtained from all woodworkers/respondents after satisfactory explanation of the nature of the study before the structured interview and checklist were administered.

4.3.4.6.4 Beneficence and non-maleficence

The researcher was competent in identifying challenges faced by woodworkers working in the small scale and informal wood sector in Cameroon with the aim of increasing awareness and providing the government with statistics which may likely better their working conditions in the future. Data were collected from woodworkers with no known risks of being exposed to harm. Respondents were equally informed of no direct benefit but that their participation would likely help us find out more on how to improve occupational health and safety in their community. The time for interviewing respondents was greatly reduced by the researcher by taking reasonable time to complete the interview. This study had limited risks since it did not involve specimen collection from any respondent, thus respondents were free from harm. Psychological harm was prevented by upholding privacy, confidentiality and anonymity during the interview.

4.3.4.6.5 Justice

Justice was guaranteed by recruiting all woodworkers working in small scale and informal enterprises present at the site during study, thus giving each and every woodworker the fair chance to participate in the study. Thus, selection of woodworkers was based entirely on woodworking experience at the study sites. All respondents were given satisfactory information related to the study including the option to withdraw from the study if they wanted to, without any negative consequences or explanation (Jirojwong, Johnson & Welch 2014:70). No woodworker was unfairly targeted or excluded unreasonably on the basis of any of the prohibited grounds for discrimination: race, age, sex, sexual orientation, disability, education, religious belief, pregnancy, marital status, ethnic or social origin, conscience, belief or language (Department of Health 2015:16).

4.3.4.6.6 Anonymity, confidentiality and privacy

The anonymity of a person or a woodshop was protected by making it impossible to link aspects of data to a specific person or woodshop. Personally identifiable information such as names of respondents were omitted on the questionnaires and codes were instead attributed in the event of a publication or presentation resulting from the study.

The researcher ensured that respondents' confidentiality was respected by making sure that no information revealed by the respondents for the purpose of the study was made public in any form or known to colleagues. Also, the study was conducted in the respondents' natural setting or workshops in privacy, thus there was no violation of privacy with regard to information provided. In addition, our structured interview and checklist did not involve any form of audio/video tape-recording.

4.3.4.6.7 Obtaining permission to conduct the study

The study proposal was studied and permission to conduct the research granted by the University of South Africa Health Studies Higher Degrees Committee and the South West Regional Delegation of Public Health Cameroon (Annexures A and F). A letter of introduction was submitted and approved by the management of all the woodshops, requesting permission to conduct the study after identification (Bernard 2013:244). This

letter carried the aim of the study thus enabling the enterprise to make an informed decision and to deliver an administrative authorisation where available.

4.3.4.7 Data analysis method

A quantitative data analysis method was used in the current study. According to Creswell (2012:175), the process of analysing quantitative data involves several interrelated steps; preparing the data for analysis, beginning data analysis, reporting of the results that are found and interpretation of the results from the data analysis. Quantitative data analysis began with editing and coding of all responses to the questions of the structured interview and checklist. Data entry and cleaning was done using Microsoft office excel while data analysis was done using Epi info version 3.5.3 and the Statistical Package for the Social Science (SPSS) 17.0 Windows Version by CDC Atlanta, Georgia, USA. Descriptive statistics were used to summarise respondents' data as means and standard deviation for continuous variables, and percentages for categorical variables. An annual incidence rate was estimated to facilitate international comparability.

All statistical tests were two-sided and values <0.05 were considered significant using the Pearson's Chi-square test. The Pearson correlation coefficient was also used to describe the strength and direction of the relationship between our dependent variables that is knowledge and practice of OHS.

Univariate logistic regression analysis was performed because of the dichotomous outcome variable. The final model estimated the overall effect of the variables. All variables at the univariable analysis were included in the multivariate analysis because the variables were few to cause the overcrowding of variables and increase the instability of the model. The best-fit model was also verified by Bayesian Information Criterion (BIC) statistics of model comparison. The analysed variables were considered significant if p-value was < 0.05 level at 95% CI.

4.4 VALIDITY AND RELIABILITY OF THE DATA COLLECTION INSTRUMENTS

4.4.1 Validity of the research instrument

The current study considers validity as the precision in which the findings accurately reflect the data (Smith & Noble 2015:34). The study was based on an in-depth literature review to develop main concepts explored and operational definitions were used to clearly describe the variables of the study. Congruence was ensured between research questions, objectives, investigation, findings and recommendations.

Data collection tools used were developed mainly by adapting from the questionnaires published in renowned journals and relevant studies. For example, our standardised checklist was adapted from the International Labour Organization for conducting health, safety and working conditions inspections. The research instrument was reviewed by the researcher's supervisors and pre-tested for content validity.

4.4.2 Reliability of the research instrument

In the present research, structured interview questions were clearly worded and verified by the supervisors with the expectation of obtaining the same responses from all respondents. The two data collection tools were pretested by conducting a pilot study to verify if responses from respondents selected from different woodshops would differ. The feedbacks obtained from the results of the pilot study were used to refine the questionnaire. The data collection tool comprised mostly closed-ended questions to reduce the introduction of bias and improve the tendency to produce the same results on repeated trails. In circumstances where the respondents did not understand the meaning of specific terms or phrases, the researcher explained in detail, the meaning in simple language. The filled questionnaire was properly checked upon completion, by the researcher for completeness and consistency.

4.5 CONCLUSION

This chapter has described the steps, methods and procedure used in conducting the current study. The research design and methodology used including population, sample, research instrument, data collection and the ethical considerations have also

been discussed in detail. Data analysis and measures of obtaining validity and reliability have also been presented. The subsequent chapter analyses and interprets the data.

CHAPTER 5

ANALYSIS, DESCRIPTION AND PRESENTATION OF RESEARCH FINDINGS

5.1 INTRODUCTION

This chapter presents findings from the analysis of data collected among woodworkers in small-scale and informal woodshops in Fako areas of Cameroon concerning the status of the occupational health and safety (OHS) of their work processes and conditions. The description and presentation of results are illustrated using tables and graphs by means of frequencies and percentages. Descriptive statistics are presented on the socio-demographic characteristics of workers in the study sites as well as their knowledge and practices of OHS. Findings on the nature and magnitude of work-related injuries and diseases as well as on the health and safety conditions of the study sites are also presented. These also describe the health and safety conditions of the study sites. Lastly, results of bivariate analysis regarding the association between workers' awareness and practices of OHS, and self-reported occupational injury rates as well as socio-demographic characteristics are also presented.

5.2 DATA MANAGEMENT AND RESPONSE RATE

The study sites included 88 small-scale and informal woodshops operating in five towns (areas) namely: Buea, Mutengene, Tiko, Muyuka and Ekona located in the Fako division of Cameroon. All (223) workers on these sites participated in this study, giving a 100% response rate. The analysis showed that the 45 (51.1%) of the small-scale and informal woodshops operated in Buea, followed by Mutengene 15 (17.0%) and 13 (14.8%) in Tiko. Just 11 (12.5%) and 4 (4.5%) were found to be operating in Muyuka and Ekona respectively as showed in figure 5.1.

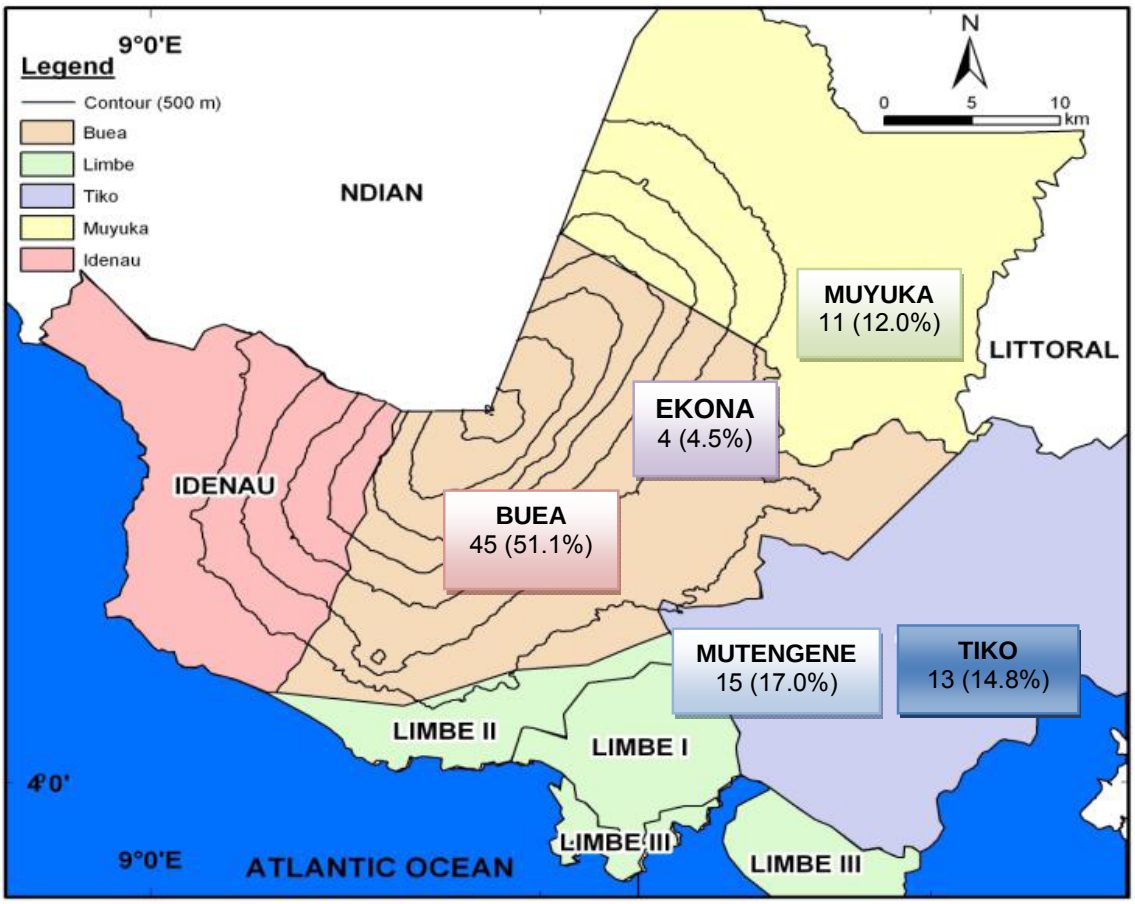

Figure 5.1 Map of Fako division in Cameroon depicting the location of study sites

(Orock & Lambi 2014:41)

5.3 RESULTS OF THE STUDY

Data were collected using (i) an interviewer-administered questionnaire administered to workers in the study sites to describe their socio-demographic characteristics, knowledge and practice of OHS and to investigate the nature and magnitude of self-reported work-related injuries and diseases; and (ii) an inspection checklist to assess working conditions at the study sites. The results are presented below.

5.3.1 Findings from the questionnaire

Overall, 223 respondents were interviewed and the results are summarised as described hereunder:

5.3.1.1 Respondents' socio-demographic characteristics

The analysis showed that the number of workers employed in each workshop ranged from 1 to 13 with an average number of employees per workshop being 4.2 (standard deviation ± 2.6 workers). Data obtained from the interviews revealed that 20 (22.7%) of the study sites employed 2 workers, 18 (20.5%) sites employed 3 workers while 3 (3.4%) sites employed 13 workers as shown in figure 5.2. Regarding the ownership of the woodshops, 52 (3.4%) of those interviewed indicated they were owners. Two hundred and two (90.6%) of the workers lived more than 1kilometre (Km) from the workshops, followed by 18 (8.1%) who lived less than 1 km away and only 3 (1.3%) had workshops located either in front of or behind their houses.

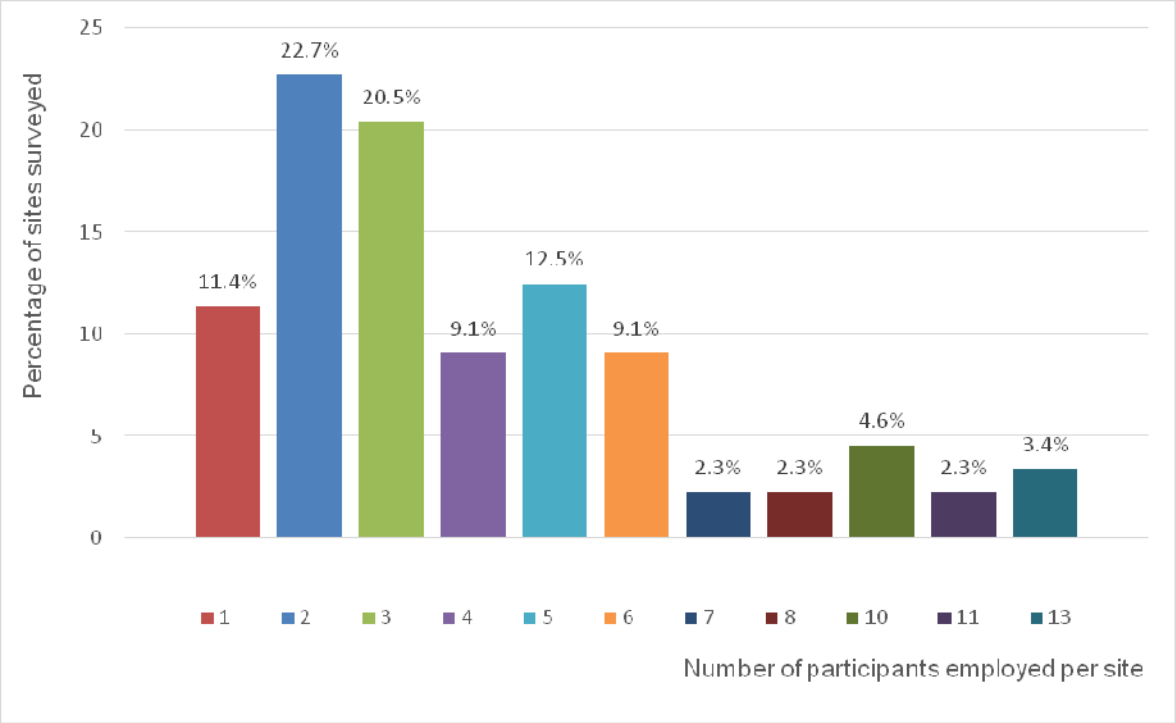

Figure 5.2 Number of surveyed woodshops and the number of workers employed per workshop

Distribution of respondents' age, gender and level of education and training

Regarding respondents' age distribution, the mean age of all the woodworkers in the study was 28.2 (standard deviation ±9.3). The age of the youngest and the oldest employees were 15 and 68 years respectively. The age group of 20-29 years had the highest respondents 99 (44.4%), followed by those between 30-39 years 64 (28.7%).

Only 9 (4.0%) respondents were 50 years or above. Having surveyed the distribution of wood-workers by sex it was revealed that the wood-working profession in the Fako division of Cameroon is male-dominated with males constituting an overwhelming majority of 218 (97.8%) compared to the 5 (2.2%) of females interviewed (see table 5.1.)

The analysis also showed that 112 (50.2%) of the respondents had or received primary education, followed by 48 (21.5%) who had secondary education and 46 (20.6%) with technical training background. Meanwhile, 4 (1.8%) had tertiary education and 13 (5.8%) had no formal education. The respondents were asked how they acquired woodworking skills and the results revealed that 219 (98.6%) received woodworking training as compared to 4 (1.8%) who did not and they consisted mostly woodshop owners. Of those who received relevant woodwork training, 197 (90.0%) were trained through apprenticeship while 22 (10.0%) acquired training through technical education.

Respondents' job categories and work experience

The results of the analysis regarding the job category of the woodworkers showed that 82 (36.8%) were permanently employed, 74 (33.2%) worked as apprentices, 52 (23.3%) were working-owners while 15 (6.7%) were temporary workers as summarised in table 5.1. Concerning respondents' work experience, the analysis showed that the mean year of work in woodworking was 8.2 (Standard Deviation ±6.7). Out of 223 respondents, 110 (45.3%) had worked for a period not exceeding five years, followed by 11 and above years while 59 (26.5%) had between 6 and10 years of work experience.

Respondents' number of working days and working hours

The analysis showed that the average number of work days spent by all woodworkers working in their workshops was 5.9 (standard deviation ±0.4). Just 14 (6.2%) worked five days per week while a majority of the respondents 196 (87.9%) worked six days per week. Thirteen (5.8%) respondents worked for seven days per week. As summarised in table 5.1, work hour details of respondents were grouped into two categories: normal eight hour-day and more than eight hour-day. On average, respondents worked for 10.2 hours (standard deviation ±1.2) daily. Two hundred and thirteen (95.5%) respondents worked for more than eight hours a day, compared to 10 (4.5%) of respondents who worked for eight hours or less a day as summarised in table 5.1.

Table 5.1 Respondents' socio-demographic characteristics in study sites (N=223)

Characteristics of woodworkers	Frequency (N)	Percentage (%)
Age (in years)		
15-19	35	15.7
20-29	99	44.4
30-39	64	28.7
40-49	16	7.2
50 and more	9	4.0
Total	**223**	**100.0**
Sex		
Male	218	97.8
Female	5	2.2
Total	**223**	**100.0**
Level of educational		
Never attended school	13	5.8
Primary	112	50.2
Secondary	48	21.5
Technical (CAP, Probatoire, BAC and specialised training)	46	20.6
Others (University education)	4	1.8
Total	**223**	**100.0**
Medium of training (N=219)*		
Apprenticeship	197	90.0
Technical education	22	10.0
Total	**219**	**100.0**
Work experience (years)		
<1-5	101	45.3
6-10	59	26.5
11 and above	63	28.3
Total	**223**	**100.0**
Job category		
Apprentice	74	33.2
Temporal workers	15	6.7
Permanent workers	82	36.8
Working-owners	52	23.3
Total	**223**	**100.0**
Working hours		
8 hours/day	10	4.5
More than 8 hours/day	213	95.5
Total	**223**	**100.0**

*N=219 (data missing for four respondents)

5.3.1.2 Findings on knowledge and practice of occupational health and safety among respondents in study sites

5.3.1.2.1 Knowledge of occupational health and safety

The knowledge of OHS among woodworkers was assessed using 16 questions sub-divided into three sections: (i) Knowledge relating to the concept of and training in OHS, (ii) Knowledge of the use and benefits of using PPE and (iii) Knowledge about woodworking equipment and maintenance thereof**.**

5.3.1.2.1.1 Knowledge relating to the concept of OHS and OHS training

The analysis showed that of the 233 respondents interviewed, only 57 (26.5%) understood the meaning of the term OHS compared to 165 (73.5%) who did not have knowledge of the meaning of the concept. Also, Just 37 (16.6%) could define OHS correctly to mean minimising risk/accidents/injury, unlike 19 (8.5%) who wrongly defined OHS to mean taking responsibility to safeguard only oneself. One hundred and sixty-seven (74.9%) said they did not have any knowledge of the definition of OHS. Of the respondents who had knowledge of the meaning of OHS, 39 (66.1%) indicated that they were informed by their supervisors, followed by 18 (30.5%) who reported being informed during their professional/technical training while 2 (3.4%) got the information from exposure to some form of health and safety training workshop/seminar as shown in table 5.2. Two hundred and five (91.9%) reported to never receiving any OHS training at work, compared to 18 (8.1%) respondents who had received OHS training. As shown in table 5.2, out of the 18 respondents who received training, 11 (61.1%) had received training on the use of PPE, 5 (27.8%) had received training on safe operation of work equipment and 2 (11.1%) on the maintenance of work equipment.

Table 5.2 Respondents' understanding of the concept of OHS and OHS training received (N=223)

Variables	Frequency (n)	Percentage (%)	Total n (%)
Understanding of the meaning of the term *occupational health and safety*			
Yes	59	26.5	223 (100)
No	164	73.5	
Definition of occupational health and safety			
Minimising risk/accidents/injury	37	16.6	223 (100)
Taking responsibility to safeguard only oneself	19	8.5	
Do not know the correct definition	167	74.9	
Source of OHS information (N=59)*			
Professional training	18	30.5	59 (100)
Health and safety training workshop/seminar	2	3.4	
Supervisor	39	66.1	
Have received formal training on health and safety			
Yes	18	8.1	223 (100)
No	205	91.9	
If yes, content or scope of training receive (N=18)*			
Safe operation of work equipment	5	27.8	18 (100)
Maintenance of work equipment	2	11.1	
The use of personal protective equipment use	11	61.1	

*N=59 (data missing for 164 respondents because only those who could define OHS were considered)
*N=18 (data missing for 205 respondents because only those who received OHS training were considered)

5.3.1.2.1.2 Knowledge of the use and benefits of using personal protective equipment (PPE)

Regarding respondents' basic knowledge of the use and benefits of PPE, the analysis showed that, 216 (96.9%) had the knowledge that employees should not pay for PPE provided at work while 7 (3.1%) did not know. A total of 122 (99.6%) had the knowledge that workers must wear PPE where/when recommended, compared to 1 (0.4%) who did not know. All 223 (100%) respondents claimed to have knowledge of how, when and where to put on PPE such as overalls, gloves, dust mask, earplug, goggles/safety glasses, safety boots and hard hats so as to adequately protect them against inherent wood work hazards. Furthermore, 208 (93.3%) had the knowledge that lung problems are associated with the non-use of dust mask as compared to 15 (6.7%) who did not

know. A total of 195 (87.4%) had the knowledge that earplugs protect them from hearing loss while 28 (12.6%) did not know as shown in table 5.3.

Table 5.3 Knowledge of the use and benefits of using PPE (N=223)

Variables	Frequency (n)	Percentage (%)	Total n (%)
Whether employee/worker should pay for PPE provided at work			
Yes	7	3.1	223 (100)
No	216	96.9	
Who is supposed to wear PPE where required?			
All workers	222	99.6	223 (100)
Supervisors	1	0.4	
Whether respondents know how, when and where to put on PPE			
Yes	223	100.0	223 (100)
No	0	0.0	
The use of dust mask protects workers against			
Lung problems	208	93.3	223 (100)
I do not know	15	6.7	
The use of earplugs protects against			
Hearing loss	195	87.4	223 (100)
I do not know	28	12.6	

5.3.1.2.1.3 Knowledge relating to woodworking equipment and maintenance

Five questions were used to assess respondents' knowledge of woodworking equipment and maintenance. As shown in table 5.4, 138 (84.3%) of the respondents demonstrated that all work equipment should have user manuals while 35 (15.7%) respondents reported the contrary. The definition of the user manual was also asked during the interview and just 129 (57.8%) could correctly define a user manual, compared to 94 (42.2%) who could not. One hundred and sixty-three (73.1%) of the respondents were aware of the fact that nobody is supposed to operate an equipment/machine without a user manual and 60 (26.9%) respondents had no knowledge of this.

Furthermore, 139 (62.3%) respondents had the knowledge that it is the responsibility of both the employer and the worker to clean the PPE put at the disposal of the worker depending on whether some specialised skills are required to clean it or not, while 84 (37.7%) respondents gave a wrong response. The analysis also revealed that, 180 (80.7%) respondents had the knowledge that only a competent person is supposed to

control and repair equipment at the workshop, unlike 16 (7.2%) and 27 (12.1%) who reported that any incompetent worker and supervisor respectively could control and repair the equipment. As shown in table 5.4, 153 (68.6%) respondents had knowledge of the fact that, it is not advisable to use obsolete equipment at work because it exposes workers to dangers while 70 (31.4%) were unaware.

Table 5.4 Knowledge of OHS relating to work equipment and maintenance (N=223)

Variables	Results		
	Frequency (N)	Percentage (%)	Total in (%)
Whether all work equipment should have a user manual			
Yes	188	84.3	223 (100)
No	35	15.7	
Understanding of respondents' literacy level of a user manual			
A user manual is a written instruction showing how to check the equipment before operating it	47	21.1	223 (100)
A user manual is a written instruction showing how to operate the equipment safely	82	36.8	
I do not know what a user manual is	94	42.1	
Whether a worker is supposed to operate equipment without a user manual			
No worker	163	73.1	223 (100)
Supervisors only	60	26.9	
Personal protective equipment put at the disposal of the workers should be cleaned by			
Both the employer and employees	139	62.3	223 (100)
Employer only	71	31.9	
Employees only	13	5.8	
Who is supposed to control and repair equipment at the workshop?			
A competent person	180	80.7	223 (100)
Workers	16	7.2	
Supervisor	27	12.1	
Reason for the non-use of obsolete equipment at work			
It exposes workers to danger	153	68.6	223 (100)
It is cheaper	70	31.4	

5.3.1.2.1.4 Overall ranking of respondents' knowledge of selected occupational health and safety (OHS) aspects

A total of 16 questions were answered by respondents on issues related to their knowledge of selected OHS including their understanding of OHS and training received (five questions); knowledge of PPE use and benefits (five questions) and knowledge of OHS relating to work equipment and maintenance (six questions). The results are

detailed on Tables 5.2, 5.3 and 5.4 respectively. Each correct answer received a score of one (1). Scores ranging between 0-9 were ranked as low OHS knowledge, 10-12 points as fair and 13-16 as good knowledge. The average knowledge score for all respondents was 9.9 (standard deviation ± 2.1). Figure 5.3 shows that a significant number of respondents 101 (45.3%) had low knowledge of OHS closely followed by the group of 94 (42.2%) respondents who obtained a fair score while only 28 (12.6%) had good knowledge of OHS.

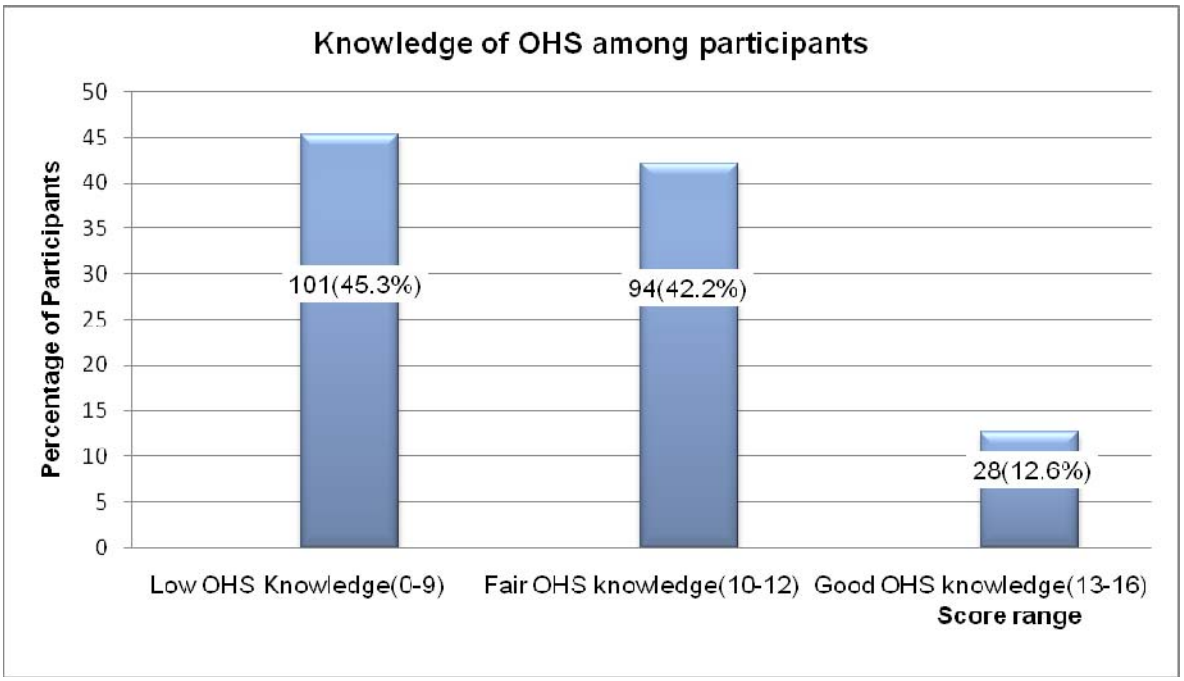

Figure 5.3 Respondents' overall knowledge of selected OHS aspects (N=223)

5.3.1.2.2 Health and safety practices at work

Respondents' OHS practices in the woodshops were evaluated using 16 questions grouped into four sections: respondents' practice of OHS training, PPE provision and use, work equipment and maintenance and housekeeping aspects.

5.3.1.2.2.1 Employers' practice of occupational health and safety (OHS) training

Regarding employers' provision of OHS training, 61 (27.4%) respondents claimed to have sometimes received training on health and safety from their current employer, 8 (3.6%) to have regularly received OHS training and 154 (69.1%) to have never received OHS training from their current employer. Out of the 223 respondents, 15 (6.7%) had

regularly received training on the use of PPEs and 69 (30.9%) had sometimes received training on the use of PPEs, compared to 139 (62.3%) who had never received this training. In addition, 166 (74.4%) of the respondents had never received information from their current employer about the hazard of their work and the risks to their health while 48 (21.5%) had sometimes and 9 (4.0%) regularly received training on the hazard of their work and risk to their health. One hundred and thirty-six (61.0%) reported that their employers never provided OHS guidelines to be used in their workshops whereas 59 (26.5%) reported that their employers sometimes provided them with OHS guidelines. Twenty eight (12.6%) reported to be regularly provided with OHS guidelines by their employers as depicted in table 5.5.

A review of evidence from records kept regarding the dates and names of workers who underwent OHS training, the name and accreditation of the company that provided training in accordance with Cameroon's regulation, availability of qualified safety representatives and health and safety committee, and meetings held revealed that 85 (96.6%) of the study sites had no evidence of workers' training as compared to 3 (3.4%) who had evidence of training. In addition, 76 (86.4%) of sites visited did not have OHS guidelines while 12 (13.6%) had OHS guidelines at the shops. Sixty-one (69.0%) of the sites never had brochures and newspapers that provided information on OHS issues available on the site as compared to 27 (31%) that had brochures and newspaper at the sites. None of the sites had available qualified safety representatives and a health and safety committee. Also, none of the sites held regular meetings to ensure and reinforce health and safety measures in the sites.

Table 5.5 Employers' practice involving OHS training (N=223)

Employers' practice of OHS training	Response			
	Not at all n (%)	Yes sometimes n (%)	Yes always n (%)	Total n (%)
Provided training on health and safety to employees	154 (69.1)	61 (27.4)	8 (3.6)	223 (100)
Provided training on the use of PPEs to employees	139 (62.3)	69 (30.9)	15 (6.7)	223 (100)
Have provided information to employees about the hazards of work and their risks to their health	166 (74.4)	48 (21.5)	9 (4.0)	223 (100)
Provided OHS guidelines in workshops	136 (61.0)	59 (26.5)	28 (12.6)	223 (100)

5.3.1.2.2.2 Respondents' practice relating to the provision and use of personal protective equipment (PPE)

Respondents' practices relating to the use of PPE provided to them (employees) were assessed and the analysis revealed that 84 (37.7%) of the respondents were always supplied with PPE and 78 (35.0%) admitted that they are sometimes supplied with PPE while the rest of the respondents reported that they were not supplied with PPE. Thirty-two (14.3%) paid for PPEs provided to them at work and 74 (33.2%) always used the PPE (overall, gloves, goggles, dust mask, earplugs, safety boots and hard hats) provided to them where/when required; 82 (36.8%) sometimes paid for PPE provided at work, meanwhile 109 (48.9%) respondents reported that they did not pay for PPE provided at work. Seventy-four (33.2%) reported to regularly using PPE where/when recommended, 121 (54.3%) reported to sometimes using PPE while the rest of the respondents claimed to not using PPE at all. Meanwhile, a total of, 109 (48.9%) respondents always used dust masks where wood dust is produced, 66 (29.6%) always wore gloves when planning wood, while 48 (21.5%) of respondents always put on ear plugs where there is high noise. In addition, 85 (38.1%) of respondents always reused gloves even when they are dirty as shown in table 5.6 below.

Table 5.6 Respondents' practices relating to the use of PPE provided (N=223)

Variables	Response			
	Not at all n (%)	Yes sometimes n (%)	Yes always n (%)	Total n (%)
The provision of PPE to workers	61 (27.4)	78 (35.0)	84 (37.7)	223 (100)
Whether workers' pay for PPE provided at work	109 (48.9)	82 (36.8)	32 (14.3)	223 (100)
How often they use PPE where/when recommended	28 (12.6)	121 (54.3)	74 (33.2)	223 (100)
The use of dust mask where wood dust is produced	23 (10.3)	91 (40.8)	109 (48.9)	223 (100)
The use of gloves when planning wood	49 (22.0)	108 (48.4)	66 (29.6)	223 (100)
The use of ear protectors (ear plugs) where/when there is high noise	102 (45.7)	73 (32.7)	48 (21.5)	223 (100)
Required to reuse gloves even when they are dirty	8 (37.2)	55 (24.7)	85 (38.1)	223 (100)

5.3.1.2.2.3 Respondents' practices of occupational health and safety (OHS) relating to work equipment and maintenance

Regarding the OHS practices of respondent relating to work equipment and maintenance at work, the score analysis indicated that, 79 (35.4%) respondents do not use obsolete equipment at work and 119 (53.4%) always check for proper functioning of equipment before use. The analysis also showed that 89 (39.9%) of respondents operated machines without the use of users' manual. In addition, 75 (33.6%) reported that their machines are always controlled and repaired by a competent person as shown in table 5.7.

Table 5.7 Respondents' practices of OHS relating to work equipment and maintenance

Respondents' practices of OHS relating to work equipment and maintenance	Response			
	Not at all n (%)	Yes sometimes n (%)	Yes always n (%)	Total n (%)
The use of outdated/obsolete equipment	90 (40.4)	54 (24.2)	79 (35.4)	223 (100)
The operation of machines without user manuals	54 (24.2)	80 (35.9)	89 (39.9)	223 (100)
The checking of equipment/machines for proper functioning before usage	26 (11.7)	78 (35.0)	119 (53.4)	223 (100)
The control and repair of equipment by an expert/competent person	29 (13.0)	119 (53.4)	75 (33.6)	223 (100)

5.3.1.2.2.4 Respondents' practice relating to housekeeping aspects

The practice of housekeeping was investigated among respondents interviewed. The scores are detailed in table 5.8. The analysis revealed that, the 109 (48.9%) respondents interviewed regularly cleaned wood dust on the floor, 143 (64.1%) always have ample working and storage space at the workshop and 80 (35.9%) of respondents always have and use waste receptacles. Concerning the management of waste, especially wood dust, 138 (61.9%) always sell wood dust for fuel and fertilizer, followed by 56 (25.1%) who always dispose the wood dust at the dumping ground and 7 (3.1%) who allow the wood dust to accumulate on the ground.

Table 5.8 Respondents' practice relating to housekeeping (N=223)

Respondents' practices relating to housekeeping	Response			
	Not at all n (%)	Yes sometimes n (%)	Yes always n (%)	Total n (%)
The cleaning of wood dust on the floor	10 (4.5)	104 (46.6)	109 (48.9)	223 (100)
Have ample working and storage space at the workshop	9 (4.0)	71 (31.8)	143 (64.1)	223 (100)
Have and use waste receptacle at the workshop	90 (40.0)	53 (23.8)	80 (35.9)	223 (100)
How waste most especially wood dust is managed at the workshop:				
Selling the wood dust to be used as fuel and fertilizer	61 (27.4)	24 (10.8)	138 (61.9)	223 (100)
Disposing at dumping ground	33 (14.8)	134 (60.1)	56 (25.1)	223 (100)
Abandoning the wood dust to accumulate on the workshop floor.	207 (92.8)	9 (4.0)	7 (3.1)	223 (100)

5.3.1.2.2.5 Overall ranking of respondents' practice of selected occupational health and safety (OHS) aspects

Concerning the practice of OHS, a total of 16 questions were answered by respondents including respondents' practice of OHS training (four questions), practices relating to the provision and use of PPE (four questions), practices of OHS relating to work equipment and maintenance (four questions) and respondents' practices relating to housekeeping aspects (four questions). The results are described on tables 5.5, 5.6, 5.7 and 5.8 respectively. Each answer received a score ranging from one (1) to three (3).

Scores ranging between16-28 were ranked as poor OHS practice, 29-38 points as fair and 39-48 as good practice. The mean practice score for all the respondents was 32.1 (standard deviation ± 4.4). Analysis shows that 57 (25.6%) respondents had poor practice, 149 (66.8%) of the respondents obtained a fair score while 17 (7.6%) had a good practice of OHS as shown in figure 5.4.

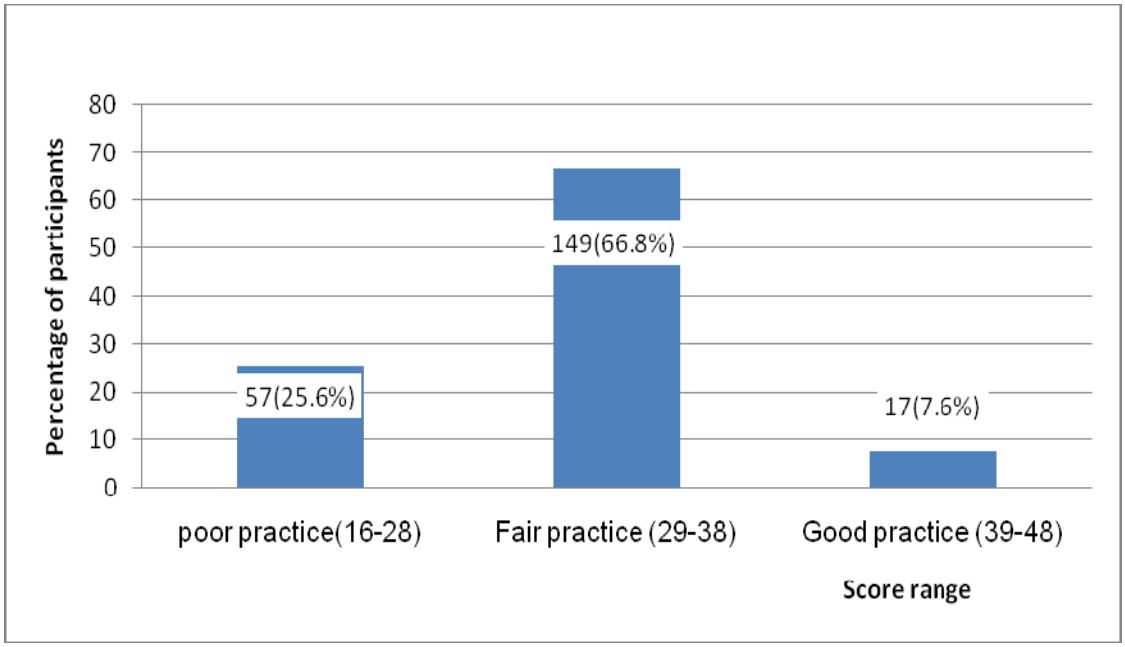

Figure 5.4 Practice of occupational health and safety (N=223)

5.3.1.3 Association between socio-demographic characteristics and knowledge and practices of occupational health and safety (OHS)

The aim of the study was to explore the relationship between socio-demographic characteristics and knowledge and practices of OHS.

5.3.1.3.1 Association between socio-demographic characteristics and knowledge of occupational health and safety (OHS)

Findings of the univariate logistic regression showed that , knowledge of selected OHS aspects was significantly associated with woodworkers' age group (P=0.000), level of education (P=0.047), medium of training (P=0.010), work experience (P=0.005) and job category (P=0.018). On multivariable analysis, knowledge of selected OHS aspects was independently associated with woodworkers' age group (P=0.000), medium of training (P=0.018), and job category (P=0.023) as depicted in table 5.9.

Table 5.9 Association between woodworkers' socio-demographic characteristics and knowledge OHS in Fako division (N=223)

	Knowledge of OHS		Total N (%)	Unadjusted Odd ratio (95% CI)	(P-Value)	Adjusted Odd ratio (95% CI)	(P-Value)
	low n (%)	M/H N (%)					
Age group (N=223)							
15-19	26 (74.3)	9 (25.7)	35 (100.0)	1	1	1	
20-29	37 (37.4)	62 (62.6)	99 (100.0)	4.84 (2.05-11.44)	0.000*	4.56 (1.89-11.00)	0.000*
30 and more	38 (42.7)	51 (57.3)	89 (100.0)	3.88 (1.63-9.22)	0.002*	02.06 (0.72-5.88)	0.179
Level of education (N=223)							
Never attended school	8 (61.5)	5 (38.5)	13 (100.0)	1		1	
Primary	59 (52.7)	53 (47.3)	112 (100.0)	1.44 (0.44-4.66)	0.546	1.20 (0.35-4.16)	0.773
Secondary	18 (37.5)	30 (62.5)	48 (100.0)	2.67 (0.76-9.41)	0.127	2.02 (0.53-7.61)	0.301
Technical*	14 (30.4)	32 (69.6)	46 (100.0)	3.66 (1.02-13.18)	0.047*	2.30 (0.57-9.24)	0.241
Other*	2 (50.0)	2 (50.0)	4 (100.0)	1.60 (0.17-15.27)	0.683	0.314 (0.02-5.36)	0.423
Medium of training (N=219)							
Apprentices hip	56 (28.4)	146 (71.6)	197 (100.0)	1		1	
Technical education	1 (4.5)	21 (95.5)	22 (100.0)	4.37 (1.43-13.36)	0.010*	4.05 (1.27-12.92)	0.018*
Work experience (N=223)							
<1-5	54 (53.5)	47 (46.5)	101 (100.0)	1		1	
6-10	18 (30.5)	41 (69.5)	59 (100.0)	2.62 (1.33-5.16)	0.005*	2.15 (0.98-4.73)	0.05
11 -and above	29 (46.0)	34 (54.0)	63 (100.0)	1.35 (0.72-2.53)	0.355	1.04 (0.43-2.52)	0.938
Job category (N=223)							
Workers	85 (49.7)	86 (50.3)	171 (100.0)	1		1	
Working-owner	16 (30.8)	36 (69.2)	52 (100.0)	2.22 (1.15-4.31)	0.018*	2.45 (1.13-5.29)	0.023*

L= Lower, M= Moderate, H=High, Other= University studies, Technical*= cap, probatoire, BAC and Specialised training, *statistically significant with p-value < 0.05*

5.3.1.3.2 Association between socio-demographic characteristics and practices of occupational health and safety (OHS)

As shown in table 5.9 the findings of the univariate logistic regression indicated that, the practice of selected OHS aspects is significantly associated with woodworkers' level of education (P=0.048) and medium of training (P=0.041). On multivariable analysis, woodworkers' level of education (P=0.045), medium of training (P=0.030), work

experience (P=0.032) and job category (P=0.037) were independently associated with practice of selected OHS aspects.

Table 5.10 Association between woodworkers' socio-demographic characteristics and practice of OHS in Fako division (N=223)

	Practice of OHS		Total n (%)	Unadjusted Odd ratio (95% CI)	(P-Value)	Adjusted Odd ratio (95% CI)	(P-Value)
	L n (%)	M/H n (%)					
Age group (N=223)							
15-19	10 (28.6)	25 (71.4)	35 (100.0)	1	1	1	
20-29	22 (22.2)	77 (77.8)	99 (100.0)	1.40 (0.58-3.35)	0.450	1.22 (0.50-2.97)	0.666
30 and more	25 (28.1)	64 (71.9)	89 (100.0)	1.02 (0.43-2.44)	0.957	0.78 (0.26-2.34)	0.663
Level of education (N=223)							
Never attended school	2 (15.4)	11 (84.6)	13 (100.0)	1		1	
Primary	27 (24.1)	85 (75.9)	112 (100.0)	0.57 (0.12-2.74)	0.485	0.56 (0.11-3.00)	0.503
Secondary	23 (47.9)	25 (52.1)	48 (100.0)	0.20 (0.04-0.99)	0.048*	0.17 (0.03-0.96)	0.045*
Technical*	2 (4.3)	44 (95.7)	46 (100.0)	4.00 (0.51-31.64)	0.189	2.42 (0.28-20.51)	0.419
Other*	3 (75.0)	1 (25.0)	4 (100.0)	0.61 (0.00-0.92)	0.043*	0.00 (0.00->1E12)	0.972
Medium of training (N=219)							
Apprenticeship	97 (49.2)	100 (50.8)	197 (100.0)	1		1	
Technical education	4 (18.2)	18 (81.8)	22 (100.0)	8.34 (1.10-63.47)	0.041*	9.77 (1.24-76.79)	0.030*
Work experience (N=223)							
<1-5	29 (28.7)	72 (71.3)	101 (100.0)	1		1	
6-10	10 (16.9)	49 (83.1)	59 (100.0)	1.97 (0.88-4.41)	0.098	2.83 (1.09-7.33)	0.032*
11 -and above	18 (28.6)	45 (71.1)	63 (100.0)	1.01 (0.50-2.02)	0.985	1.83 (0.67-5.00)	0.235
Job category (N=223)							
Workers	39 (22.8)	132 (77.2)	171 (100.0)	1		1	
Working-owner	18 (34.6)	34 (65.4)	52 (100.0)	0.56 (0.28-1.09)	0.090	0.38 (0.16-0.94)	0.037*

L= Lower, M= Moderate, H=High, Other= University studies, Technical*= cap, probatoire, BAC and Specialised training, *statistically significant with p-value < 0.05*

5.3.1.4 Relationship between knowledge of selected occupational health and safety (OHS) aspects and practice of selected OHS aspects

The relationship between the knowledge and practice of OHS variables as reported by respondents was investigated using Pearson Correlation as shown in figure 5.5. The analysis showed that higher levels of knowledge of selected OHS aspects are associated with higher levels of practices of selected OHS aspects. A weak positive correlation was found between Knowledge of selected OHS aspects and Practice of selected OHS aspects (r (2)=0.052, p=0.000) as shown in the scatter plot in figure 5.5 below.

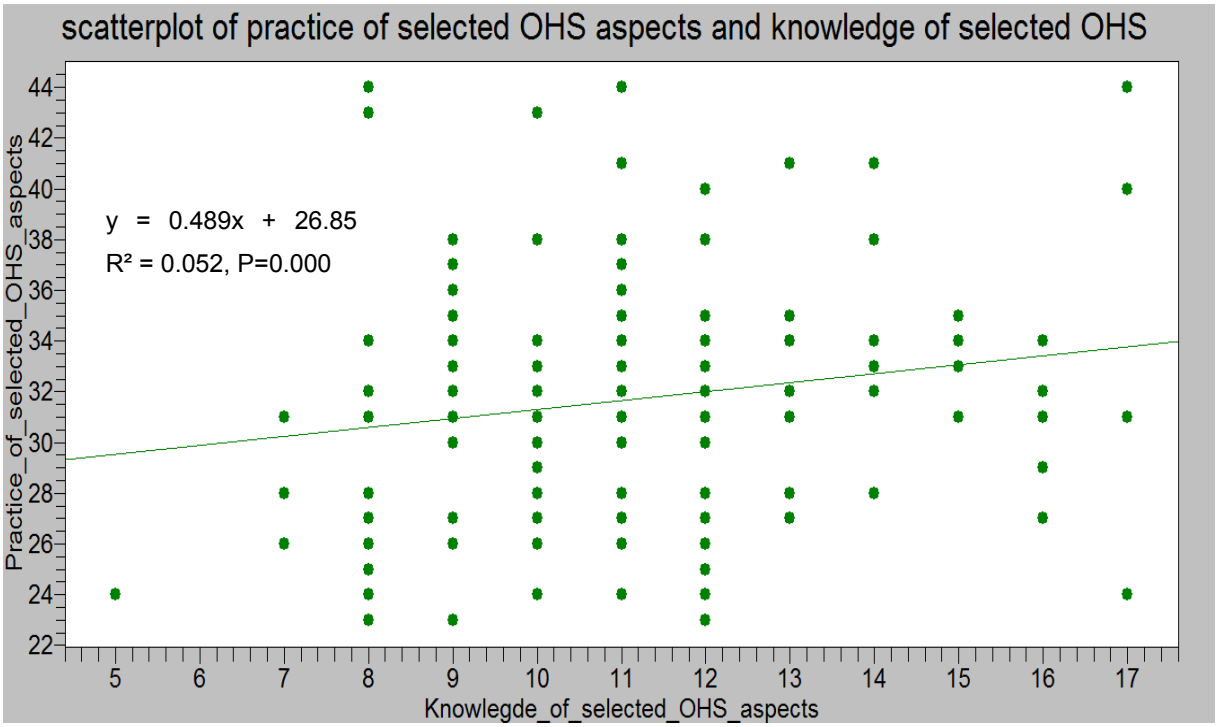

Figure 5.5 Scatter plot of practice of selected OHS aspects and knowledge of selected OHS aspects (N=223)

5.3.1.5 Nature and magnitude of work-related injuries and diseases

This section presents data on the nature and magnitude of self-reported work-related injuries sustained by respondents within the past 12 months. As shown in table 5.13. One hundred and ninety-two (86.1%) of the respondents reported they had sustained at least a work-related injury in the past 12 months, with 185 (83.0%) of the injuries sustained inside the workshop (within the production area) while 38 (17.0%) occurred in the workshop surroundings. A total of 513 work-related injuries were reported by respondents within the same period.

5.3.1.5.1 Nature and sources of injuries experienced by respondents

With regards to the frequency and kinds of injuries sustained by respondents, results of the analysis showed that out of the 513 work-related injuries reported, 170 (33.1%) respondents sustained cut/open wound injuries, followed by sprain/strain, 158 (30.8%) and backache 96 (18.7%) injuries. With regards to sources of injuries reported by respondents, 134 (26.1%) of sprains occurred through hitting or being hit or cut by an object, followed by 45 (8.8%) of cut open wound and 9 (1.8%) of fracture of the lower and upper limbs. The analysis also indicated that lifting, pushing or pulling objects constituted 92 (41.3%) of cuts or open wound and 58 (26.0%) of backache injuries as compared to 9 (4.0%) injured respondents that had burn injuries that were related to the contact with hot objects or hot surfaces of machines as shown in table 5.11.

Table 5.11 Nature and sources of work-related injuries as reported by respondents at the study sites (n=513)

Sources of injuries	Sprain n (%)	Cut/open wound n (%)	Burns	Chronic joint or muscle injury n (%)	Back-ache n (%)	Frac-ture of the upper and lower limbs n (%)	Total
Hitting or being hit or cut by an object	134 (26.1)	45 (8.8)	0 (0)	0 (0)	0 (0)	9 (1.8)	188 (36.6)
Lifting, pushing or pulling object	9 (1.8)	92 (17.9)	0 (0)	4 (0.8)	58 (11.3)	0 (0)	163 (31.8)
Falls, trips and slips of a person	15 (2.9)	32 (6.2)	0 (0)	21 (4.1)	20 (3.9)	12 (2.3)	100 (19.5)
Contact with chemical or substance	0 (0)	1 (0.2)	0 (0.0)	0 (0)	0 (0)	0 (0)	1 (0.2)
Contact with hot object	0 (0)	0 (0)	9 (1.8)	0 (0)	0 (0)	0 (0)	9 (1.8)
Contact with electricity	0 (0)	0 (0)	3 (0.6)	31 (6.0)	18 (3.5)	0 (0)	52 (10.1)
Total	**158 (30.8)**	**170 (33.1)**	**12 (2.4)**	**56 (10.9)**	**96 (18.7)**	**21 (4.1)**	**513 (100)***

N=513* = some respondents reported more than one injury.

5.3.1.5.2 Body location of work-related injuries as reported by respondents

With respect to the injured body location, respondents reported that upper limbs were the most 192 (100%) injured part of the body with the hand, fingers and thumb accounting for over 169 (88.0%) of these as indicated in figure 5.6 (a photograph showing finger amputation of a woodworker as a result of woodworking activities) as compared to the shoulder 21 (10.9%) and wrist 2 (1.0%). Further analysis revealed that the respondents sustained 168 (68.7%) injuries on the lower limbs with the foot and toes being the common 124 (55.6%) injured part of the lower limbs. Thirty-seven (16.6%) respondents had head and neck injuries as summarised in table 5.12 below.

Table 5.12 Body location of work-related injuries as reported by respondents (N=223)

Body location of injury	Frequency (n)	Percentage (%)
Upper limbs		
Hand fingers and thumb	169	75.8
Shoulder	21	9.4
Wrist	2	0.9
Missing	31	13.9
Total	**223**	**100**
Trunk		
Back	82	36.8
Chest	92	41.2
Missing	78	35.0
Total	**223**	**100**
Lower limbs		
Knee	2	0.9
Ankle	2	0.9
Feet and toes	124	55.6
Lower leg	3	1.3
Missing	92	41.3
Total	**223**	**100**
Head and neck		
Yes	37	16.6
No	186	83.4
Total	**223**	**100**

Figure 5.6 A photograph showing finger amputation of a woodworker as a result of woodworking activities

5.3.1.5.3 Sources of work-related injuries as reported by respondents

The results presented in table 5.12 indicate the sources of work-related injuries as reported by respondents. Out of 192 respondents that sustained at least a work-related injury, 97 (50.5%) of injured respondents were due to lack of personal protective equipment (PPE) with sprain 46 (24.0%) being the main injury caused by lack of PPE. One hundred and twenty-one (64.6%) suffered from work-related injuries due to carelessness and sprain 56 (29.2%) was still the main injury sustained by respondents as a result of carelessness on their part.

The analysis also showed that 66 (34.4%) respondents sustained injuries as a result of fatigue caused by overworking and 19 (9.9%) of the sustained injuries were mainly backache. A more detailed survey showed that 42 (21.9%) respondents suffered injuries due to lack of modern equipment and 13 (6.8%) of injuries were due to lack of skills or inexperience. The main injuries caused by lack of modern equipment and lack of skill or inexperience were cut/open wounds 23 (12.0%) and sprain 5 (2.6%) as summarised in the table 5.13 below.

Table 5.13 Sources of work-related injuries as reported by respondents (N=223)

Possible reasons for the accident at work (N=192)*	Sprain	Cut/open wound	Burns	Chronic joint or muscle condition	Backache	Fracture of the upper and lower limbs	Total n (%)
Lack of personal protective equipment (PPE)/insufficient use of this equipment							
Yes	46 (24.0%)	35 (18.2%)	7 (3.6%)			9 (4.7%)	97 (50.5)
No	12 (6.3%)	29 (15.1%)	5 (2.6%)	21 (10.9%)	22 (11.4%)	6 (3.1%)	95 (49.5)
Total	**58 (30.2%)**	**64 (33.4%)**	**12 (6.3%)**	**21 (10.9%)**	**22 (11.4%)**	**15 (7.8%)**	**192 (100.0)**
Carelessness							
Yes	56 (29.2%)	37 (19.3%)	2 (1.0%)	14 (7.3%)	11 (5.7%)	1 (0.5%)	121 (63.0)
No	2 (1.0%)	27 (14.1%)	10 (5.2%)	7 (3.6%)	11 (5.7%)	14 (7.3%)	71 (37.0)
Total	**58 (30.2%)**	**64 (33.4%)**	**12 (6.3%)**	**21 (10.9%)**	**22 (11.4%)**	**15 (7.8%)**	**192 (100.0)**
Fatigue caused by overworking							
Yes	12 (6.3%)	17 (8.9%)	2 (1.0%)	13 (6.8%)	19 (9.9%)	3 (1.6%)	66 (34.4)
No	46 (24.0%)	47 (24.5)	10 (5.2%)	8 (4.2%)	3 (1.6%)	12 (6.3%)	126 (65.6)
Total	**58 (30.2%)**	**64 (33.4%)**	**12 (6.3%)**	**21 (10.9%)**	**22 (11.4%)**	**15 (7.8%)**	**192 (100.0)**
Lack of modern equipment							
Yes	7 (3.6%)	23 (12.0%)	1 (0.5%)	3 (1.6%)	6 (3.1%)	2 (1.0%)	42 (21.9)
No	51 (26.6%)	41 (21.4%)	11 (5.7%)	18 (9.4%)	16 (8.3%)	13 (6.8%)	148 (77.1)
Total	**58 (30.2%)**	**64 (33.4%)**	**12 (6.3%)**	**21 (10.9%)**	**22 (11.4%)**	**15 (7.8%)**	**192 (100.0)**
Lack of skill or inexperience							
Yes	5 (2.6%)	2 (1.0%)		1 (0.5%)	2 (1.0%)	3 (1.6%)	13 (6.8)
No	53 (27.6%)	62 (32.3%)	12 (6.3%)	20 (10.4%)	20 (10.4%)	12 (6.3%)	179 (93.2)
Total	**58 (30.2%)**	**64 (33.4%)**	**12 (6.3%)**	**21 (10.9%)**	**22 (11.4%)**	**15 (7.8%)**	**192 (100.0)**

*N=192 (data missing for 31 non-injured respondents)

5.3.1.5.4 Nature of treatment received for work-related injuries

Regarding the nature of treatment received for work-related injuries among respondents, the analysis showed that, 46 (24.0%) of the injured respondents that suffered from cuts, received basic first aid treatment while 18 (9.4%) of cut injured respondents were referred to the hospital for treatment and further management. Further analysis showed that 23 (12.0%) of all injured respondents received no treatment for injuries suffered as summarised in table 5.14 below. Analysis also showed that, those referred to hospital mostly sustained deep lacerations and cuts 18 (9.4%) and fractures of the upper and lower limbs 11 (5.7%).

Table 5.14 Nature of treatment received for work-related injuries as reported by respondents (N=223)

Characteris-tics	Sprain	Cut/open wound	Burns	Chronic joint or muscle injury	Backache	Fracture of the upper and lower limbs	Total n (%)
Injury management actions (N=192)*							
Administered first aids	38 (19.8%)	46 (24.0%)	9 (4.7%)	7 (3.6%)	14 (7.3%)	4 (2.1)	**118 (61.5)**
Taken to the hospital	6 (3.1%)	18 (9.4%)		9 (4.7%)	7 (3.6%)	11 (5.7)	**51 (26.6)**
No action	14 (7.3%)		3 (1.6%)	5 (2.6%)	1 (0.5%)		**23 (12.0)**
Total	**58 (30.2%)**	**64 (33.4%)**	**12 (6.3%)**	**21 (10.9%)**	**22 (11.4%)**	**15 (7.8%)**	**192 (100.0%)**

5.3.1.5.5 Lost days due to sick leave

The analysis revealed that out of 192 respondents that sustained at least a work-related injury, 62 (27.8%) took time off work due to work-related injuries while 130 (67.7%) did not. Regarding those who took time off work due to work-related injuries, 24 (12.5%) took time off work for 1-4 days, 22 (11.5%) took off work for 5-10 and 16 (8.3%) took off work for more than 10 days. Furthermore, respondents that took time off work for 1-4 days were mainly due to sprain 13 (6.8%) while respondents who took time off work for 5-10 days were mainly due to fracture of the upper and lower limbs 9 (4.7%). In addition, respondents who took time off work for greater than 10 days were mainly due to backache 7 (3.6%) as shown in table 5.15.

Table 5.15 Days lost due to sick leave as reported by respondents (N=223)

Characteristics	Sprain	Cut/open wound	Burns	Chronic joint or muscle injury	Backache	Fracture of the upper and lower limbs	Total n (%)
Days absent from work or sick leave (N=192)*							
None	39 (20.3%)	57 (29.7%)	8 (4.2%)	12 (6.3%)	10 (5.2%)	4 (2.1)	**130 (67.7)**
1-4 days	13 (6.8%)	2 (1.0%)	4 (2.1%)	3 (1.6%)	2 (2.1%)		**24 (12.5)**
5-10 days	4 (2.1%)	2 (2.1%)		4 (2.1%)	3 (1.6%)	9 (4.7)	**22 (11.5)**
>10 days	2 (2.1%)	3 (1.6%)		2 (2.1%)	7 (3.6%)	2 (2.1)	**16 (8.3)**
Total	**58 (30.2%)**	**64 (33.4%)**	**12 (6.3%)**	**21 (10.9%)**	**22 (11.4%)**	**15 (7.8%)**	**192 (100.0%)**

*N=192 (Data missing for 31 non-injured respondents)

5.3.1.6 Association between the socio-demographic characteristics and self-reported injury rates

Findings of the univariate and multivariable logistic regression revealed that, only the age group of the respondents was significantly associated with the injury rate ($p<0.034$). A detailed analysis revealed that woodworkers of age 30 and above had a less likelihood of being injured than the younger workers ($P=0.034$) as depicted in table 5.16.

Table 5.16 Association between the socio-demographic characteristics and self-reported injury rates (N=223)

	Injury rate		Total n(%)	Unadjusted Odd ratio (95% CI)	(P-Value)	Adjusted Odd ratio (95% CI)	(P-Value)
	Yes n(%)	No n(%)					
Respondent's sex							
Male	189(86.7)	29(13.3)	218(100.0)	1		1	
Female	3 (60.0)	2 (40.0)	5 (100.0)	0.23(0.04-1.44)	0.116	0.28(0.03-2.48)	0.255
Age group (N=223)							
15-19	34 (97.1)	1 (2.9)	35 (100.0)	1	1	1	
20-29	88 (88.9)	11 (11.1)	99 (100.0)	0.24(0.03-1.89)	0.174	0.25(0.03-2.06)	0.200
30 and more	19 (21.3)	70 (78.7)	89 (100.0)	0.11 (0.01-0.84)	0.034*	0.11(0.01-0.90)	0.039*
Level of education (N=223)							
Never attended school	11 (84.6)	2 (15.4)	13 (100.0)	1	1	1	
Primary	92 (82.1)	20 (17.9)	112(100.0)	0.83(0.17-4.07)	0.825	0.52(0.10-2.66)	0.429
Secondary	45 (93.8)	3 (6.3)	48 (100.0)	2.73(0.04-18.36)	0.302	2.56(0.35-18.62)	0.354
Technical*	41 (89.1)	5 (10.9)	46 (100.0)	1.49(0.25-8.75)	0.658	1.93(0.29-12.92)	0.497
Other (university studies)	3 (75.0)	1 (25.0)	4 (100.0)	0.55(0.04-8.27)	0.662	0.62(0.02-16.45)	0.776
Medium of training (N=219)							
Apprentices hip	172(87.3)	25 (12.7)	197(100.0)	1	1	1	
Technical education	17 (77.3)	5 (22.7)	22 (100.0)	0.67(0.36-1.25)	0.208	0.90(0.42-1.93)	0.792
Work experience (N=223)							
<1-5	91 (90.1)	10 (9.9)	101(100.0)	1		1	
6-10	51 (81.0)	12 (19.0)	63 (100.0)	0.61(0.23-1.60)	0.316	1.02(0.31-3.35)	0.972
11 and above	50 (84.7)	9 (15.3)	59 (100.0)	0.47(0.19-1.16)	0.100	0.81(0.24-2.82)	0.745
Job category (N=223)							
Workers	150(87.7)	21 (12.3)	171(100.0)	1		1	
Working-owner	42 (80.8)	10 (19.2)	52 (100.0)	0.59(0.26-1.34)	0.208	0.91(0.33-2.50)	0.847

Technical= cap, probatoire, BAC and Specialised training *statistically significant with p-value < 0.05*

5.3.1.7 Association between knowledge and practice of OHS and self-reported injury rates

Findings of the univariable and multivariable logistic regression revealed a statistically significant association between self-reported injuries rate and practice of OHS (P=0.010). Detailed results revealed that woodworkers who practice safe working measures had a less likelihood of being injured as compared to woodworkers with poor practice of OHS (P=0.010).

Table 5.17 Association between knowledge and practice of OHS and self-reported injury rates in Fako division (N=223)

	Injury rate		Total n(%)	Unadjusted Odd ratio (95% CI)	(P-Value)	Adjusted Odd ratio (95% CI)	(P-Value)
	Yes N (%)	No N (%)					
Knowledge of OHS (N=223)							
Low	85 (84.2)	16 (15.8)	101 (100.0)				
Moderate	82 (87.2)	12 (12.8)	94 (100.0)	1.29(0.57-2.88)	0.541	1.25(0.55-2.86)	0.598
High	25 (89.3)	3 (10.7)	28 (100.0)	1.57(0.42-5.82)	0.501	1.73(0.44-6.74)	0.431
Practice of OHS (N=223)							
Poor	50 (87.7)	7 (12.3)	57 (100.0)	1	1	1	
Fair	132 (88.6)	17 (11.4)	149 (100.0)	1.09(0.43-2.78)	0.862	1.05(0.41-2.69)	0.922
Good	10 (58.8)	7 (41.2)	17 (100.0)	0.20 (0.06-0.70)	0.012*	0.19(0.05-0.67)	0.010*

Statistically significant with p-value < 0.05

5.3.2 Results of the inspection and observation checklist

The nature of the working conditions of 88 sites was inspected using a checklist, document examination and observation to elicit information about employers' compliance with health and safety legislation and responsibilities. Pictures of important aspects observed that demonstrate the environmental conditions, infrastructural and current practices in the study sites were taken and are presented as evidence in this section.

5.3.2.1 Workplace conditions

The workplace conditions were assessed using the following variables: the condition of work premises, common workplace hazards, fire safety and first aid.

5.3.2.1.1 Work premises

The work premises (workshops) were inspected to identify hazardous working conditions that the workers were exposed to.

5.3.2.1.1.1 Walkways

Regarding walkways, 49 (55.7%) of the woodshops surveyed had narrow walkways with obstacles such as electrical cables and stacked wood obstructing the pathways and free movement of workers. Figure 5.8 portrays the photograph of electrical cables and packed wood obstructing narrow walkways at the workshop that was taken by the researcher during the site inspection. This can cause workers to stumble and fall resulting in serious injury.

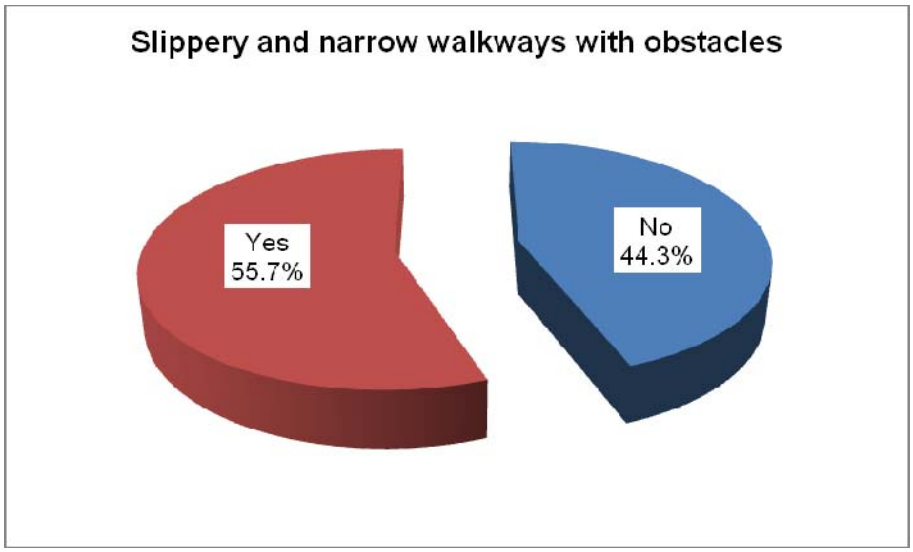

Figure 5.7 Surveyed sites with slippery and narrow walkways with obstacles (N=88)

Figure 5.8 A photograph depicting electrical cables and packed wood obstructing the narrow walkways that can cause workers to stumble and fall resulting in serious injury

5.3.2.1.1.2 Workplace facilities

Regarding the condition of facilities in the woodshops inspected, the analysis showed that 35 (39.8%) of the workplaces operated in enclosed dilapidated structures, followed by 30 (34.1%) which operated in a workshop with just some side walls and 13 (14.8%) of workshops occupied premises with only roof with no side walls. As shown in the examples in figure 5.9, 10 (11.4%) operated in open spaces with most of these workshops located along the main roads and streets. Figure 5.10 also portrays the photograph of a roof only, as well as enclosed workshops taken by the researchers during the site inspection.

The results also showed that 72 (81.8%) of the sites were constructed from fire flammable materials such as wood, bamboos and thatches while 16 (18.2%) were constructed from inflammable material such as bricks. Forty one (46.6%) sites allowed the manipulation of inflammable instruments in the woodshops while 47 (53.4%) that did not.

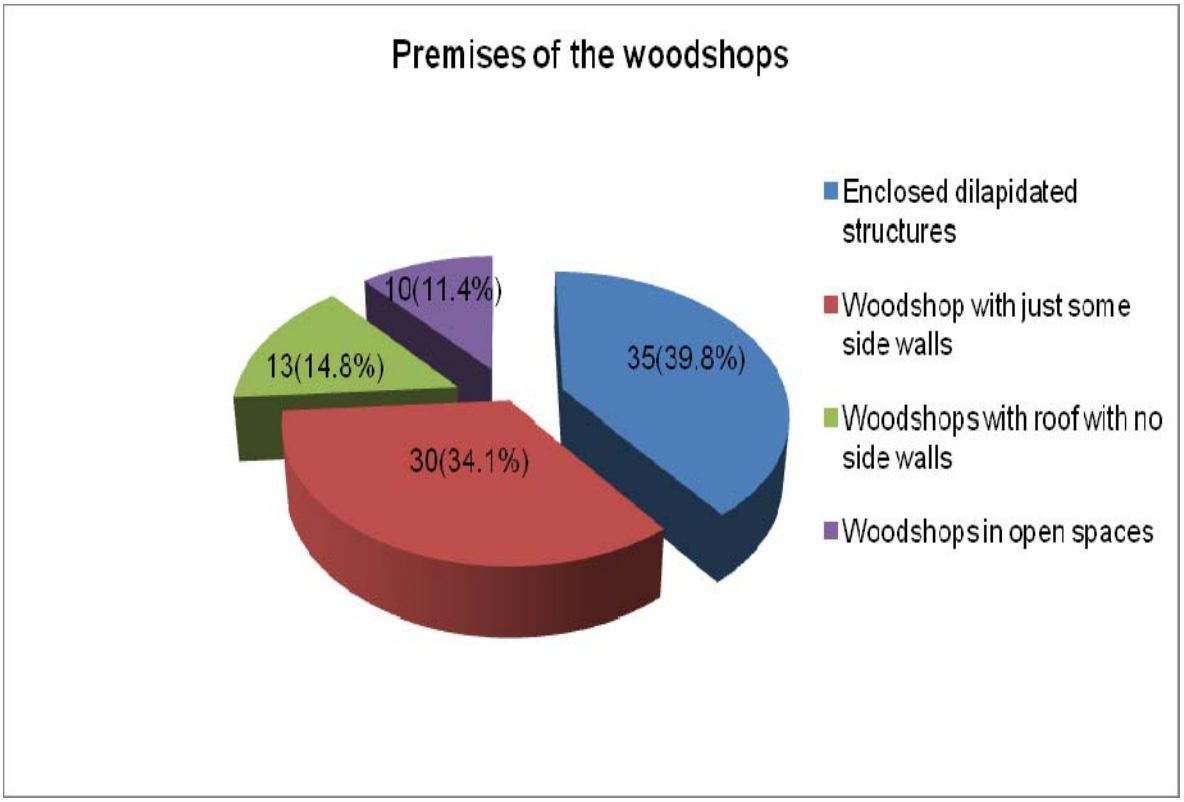

Figure 5.9 Distributions of workshops according to their premises structure

Figure 5.10 A photograph showing a roof-only workshop without side walls (A) and an enclosed workshop (B) with side walls constructed from wood

5.3.2.1.1.3 Status of lighting and ventilation in the study sites

The analysis showed that out of the 35 enclosed woodshops surveyed, 30 (85.7%) woodshops lacked adequate lighting with the use of mainly daylight conditions as

lighting for work operations and did not improve lighting by providing artificial or spot lighting on machines to cover period of darkness. The analysis revealed that, 30 (85.7%) had insufficient or inadequate ventilation resulting in poor circulation of air due the use of no or small windows and single doors at the workshops as shown in figure 5.11.

Figure 5.11 A photograph showing a woodshop lacking adequate lighting and ventilation

5.3.2.1.2 Exposure of respondents to physical hazards

The analysis of the study showed that 85 (96.6%) of the study sites surveyed involved work procedures that used hand-held equipment that expose workers to excessive levels of vibration and heavy planning machines that exposed workers to loud noise. Inspection analysis found workers working in open air or poorly ventilated workshops exposing them to Incremental weather conditions. Detailed analysis revealed that 10 (11.4%) of the study sites' workers were exposed to excessive heat and UV radiation from the sun during hot seasons and excessive cold due to rain and storm during the rainy season as depicted in figure 5.12.

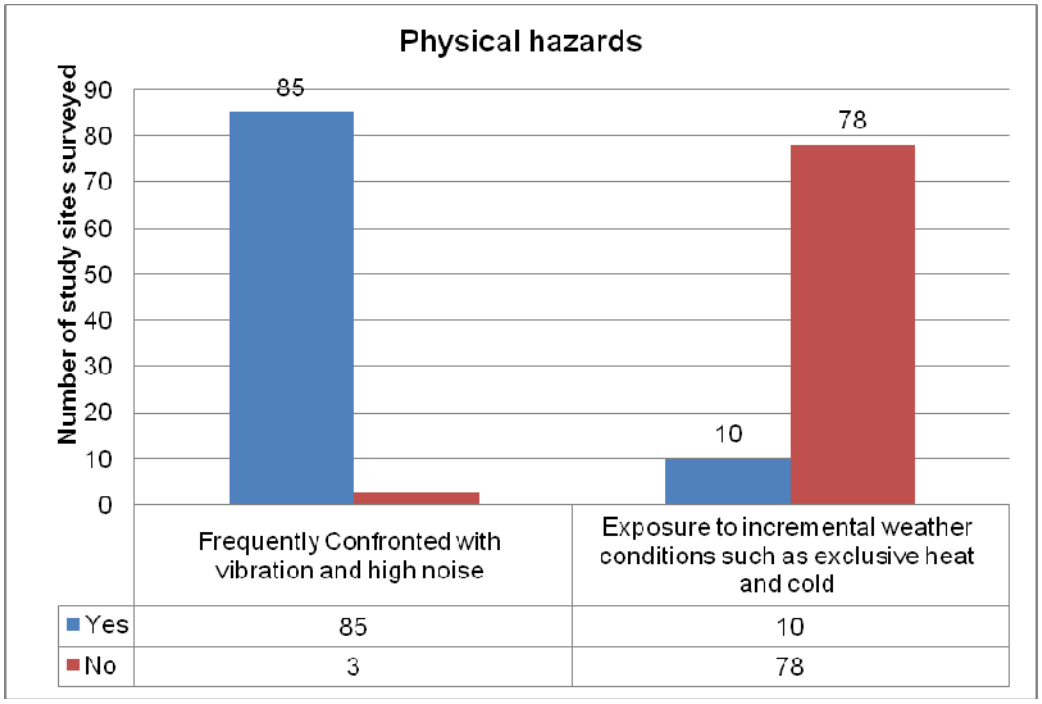

Figure 5.12 Site workers' exposure to physical hazards (n=88)

5.3.2.1.3 Exposure of workers to chemicals hazards

The analysis revealed that 86 (97.7%) site workers were exposed to hazardous chemicals such as wood dust and diluents. Also, 80 (90.9%) of the sites had unlabelled and improperly stored containers of hazardous chemicals used for preservation and processing of wood. This is illustrated in figure 5.13.

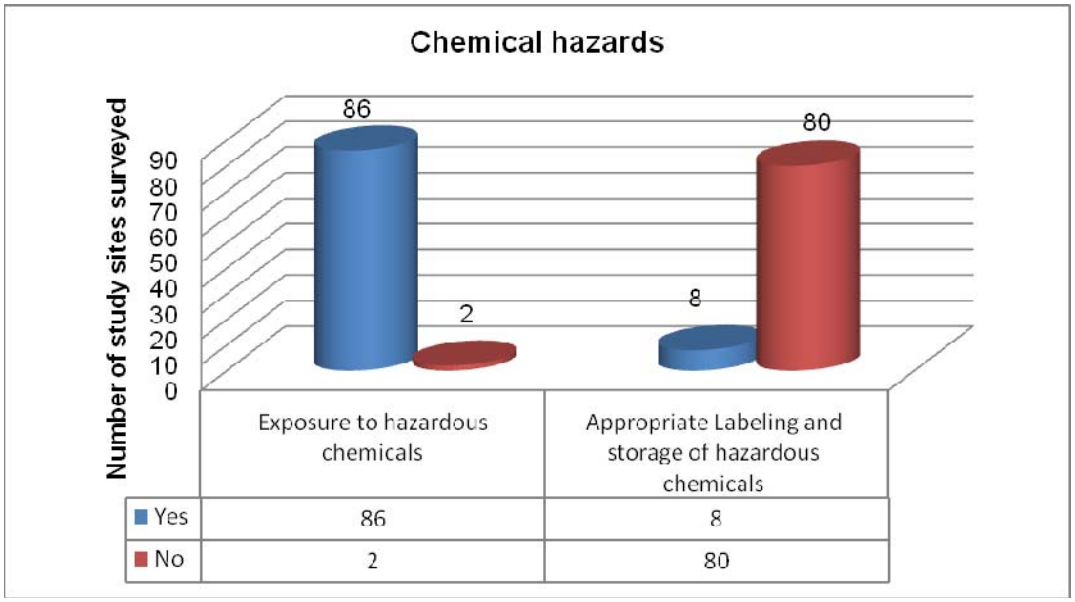

Figure 5.13 Site workers' exposure to chemical hazards (n=88)

5.3.2.1.4 Fire safety and first aid availability

The analysis of study sites revealed that 82 (93.2%) of all the 88 inspected sites never had appropriate fire extinguishers and only 3 (3.4%) of these sites place their fire extinguishers in an easily accessible area, regularly service and were in good working order. No site had available evidence of conducting fire safety drills and plans.

In addition, 7 (8.0%) sites complied with regards to the contents of first aid boxes with evidence of regular checking of the boxes and replacement of expired items meanwhile 70 (79.5%) never had first aids kits available in the study sites as shown in figure 5.14 below. None of the study sites had a first aider with training evidence nor a valid first aid certificate.

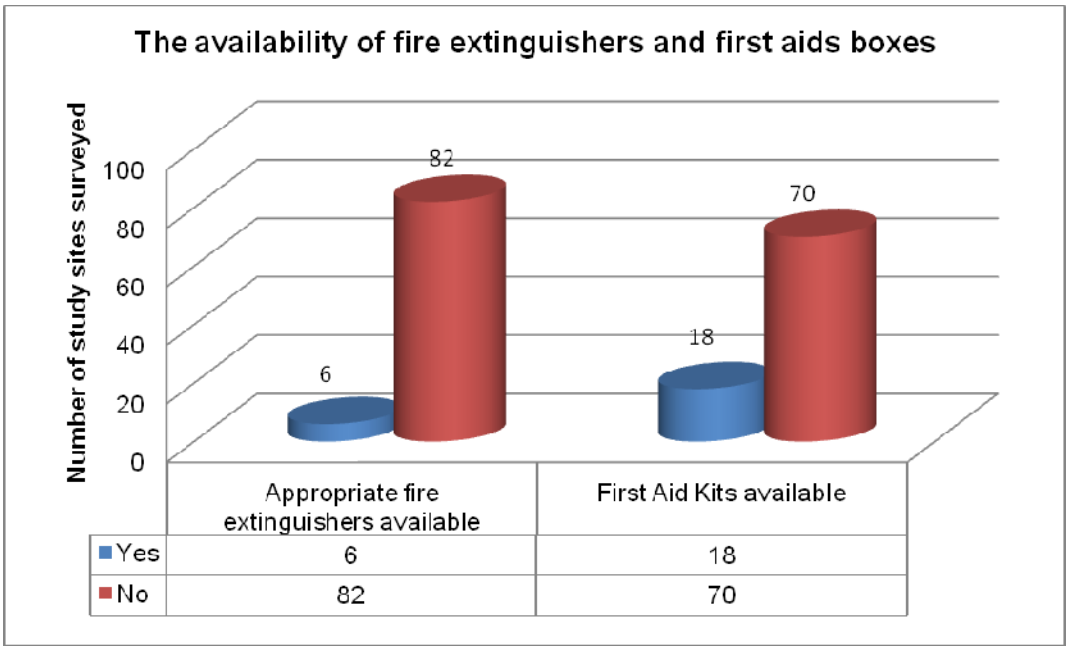

Figure 5.14 Availability of fire extinguishers and first aids boxes (n=88)

5.3.2.2 Provision of personal protective equipment

The analysis of inspection conducted across the 88 sites revealed that 61 (69.3%) of the sites did not clearly indicate requirements or areas for the use of PPE. Forty-two (47.7%) of the sites were not provided with free PPE such as overall, safety glasses gloves, dust mark, earplugs safety boots and hard hats while 67 (76.1%) of the sites

never used properly fixed guards or barriers to prevent contact with moving parts of machines as shown in figure 5.15. A more disaggregated data showed that 60 (68.2%) of sites did not maintain and replace PPE regularly. The analysis also showed that 48 (54.5%) of the sites had inadequate supervision of site workers on the use of PPE where it was needed as summarised in table 5.18.

Table 5.18 Personal protective equipment provision (N=88)

Variables	Yes		No		Total	
	N	%	N	%	N	%
Clearly mark areas requiring the use and type of personal protective equipment.	27	30.7	61	69.3	88	100
Provide free PPE such as gloves, dust mask and earplugs.	46	52.3	42	47.7	88	100
Use properly fixed guards or barriers to prevent contact with moving parts of machines such as miter saw, table saw and so on.	21	23.9	67	76.1	88	100
Maintain and replace protective equipment regularly.	28	31.8	60	68.2	88	100
The supervisor makes sure that everyone uses PPE where it is needed.	40	45.5	48	54.5	88	100

Figure 5.15 A photograph showing a spindle moulder and wood cutter machine regularly used without properly fixed guards exposing site workers to the blade

5.3.2.3 Inspection of the state of work equipment and maintenance

Regarding the status of work equipment, the analysis of the inspection conducted showed that 57 (64.8%) sites used mostly obsolete equipment with 77 (87.5%) of these sites operating machines without the user's manual. A more disaggregated data showed that 44 (50.0%) of the sites' electric hand-held equipment such as jig saw, nail gun, electric drill, hand-held sanders just to name a few were not well insulated against

electric shock and heat. In addition, 65 (73.9%) of the site inspection showed unsafe electrical connections for equipment and light, and trailing electrical wires as illustrated in figure 5.16.

Regarding maintenance, 64 (72.7%) sites did not maintain their machines (bandsaw, sanders, wood planer, wood cutter and so on) regularly, thus extremely loud noise and vibration were perceived during site inspection. Forty-six (52.3%) of the sites did not solicit the services of a competent person to regularly inspect and repair their equipment. The workers themselves did the inspection and repair of their equipment as illustrated in table 5.19.

Table 5.19 The state of work equipment and maintenance (N=88)

Variables	Yes		No		Total	
	N	%	N	%	N	%
Use of mostly outdated/obsolete equipment.	57	64.8	31	35.2	88	100
Bandsaw, sanders, wood planer, wood cutter machines etc. are maintained regularly in order to reduce noise and vibration.	24	27.3	64	72.7	88	100
All machines have their user manuals.	11	12.5	77	87.5	88	100
Ensure safe wiring connections for equipment and lights.	23	26.1	65	73.9	88	100
Electric hand-held equipment such as jig saw, nail gun, electric drill, hand-held sanders etc. are well insulated against electric shock and heat?	44	50.0	44	50.0	88	100
Regular inspection and repairs of the equipment by an expert/competent person.	42	47.7	46	52.3	88	100

Figure 5.16 Photographs showing unsafe electrical connection and trailing electrical wires exposing workers to high risks of electrical shock

5.3.2.4 Housekeeping aspects in the study sites

The inspection analysis of housekeeping aspects as shown in figure 5.17 revealed that 46 (52.3%) neither got rid of waste nor cleared other garbage from workrooms while 42 (47.7%) of the sites lacked adequate working and storage space. In addition, 65 (73.9%) of the sites never had appropriately placed waste containers for collection of dirt while 83 (94.3%) of the workplaces lacked adequate drainage systems for waste and running water which usually leads to flooding during the rainy season as shown in figure 5.18.

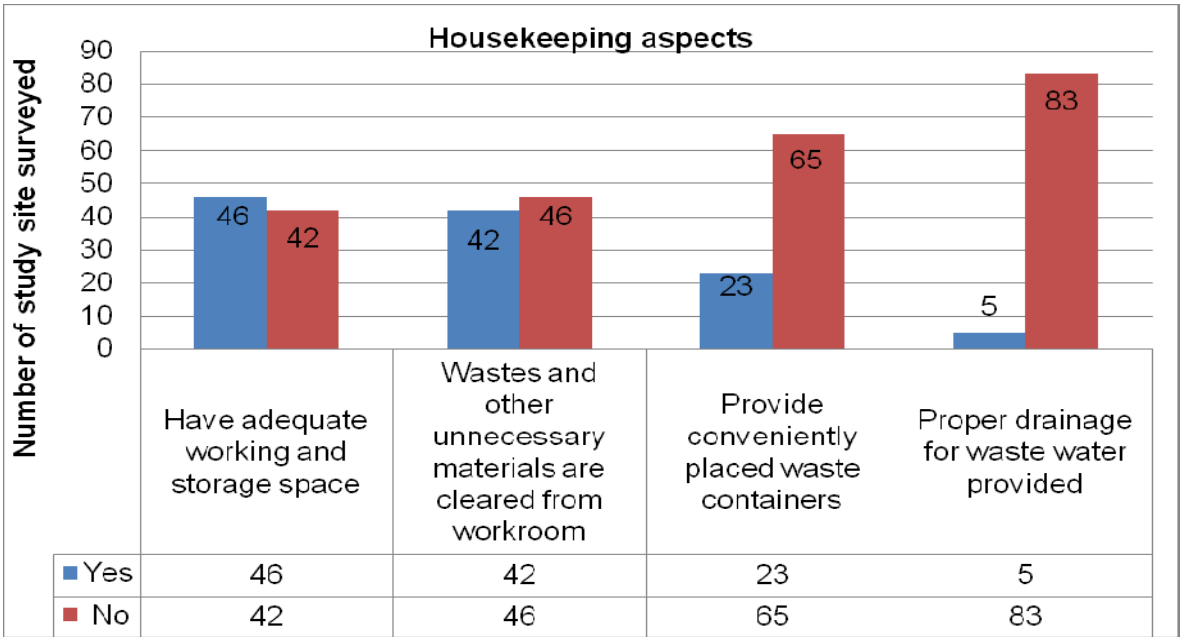

Figure 5.17 Sites' housekeeping aspects (N=88)

Figure 5.18 A photograph showing a flooded woodshop due to lack of a proper drainage system

5.3.2.5 Ergonomic/manual handling hazards

The analysis showed that 86 (97.7%) sites' workers were exposed to ergonomic hazards; 86 (97.7%) of sites' employees were confronted with long duration (>4 hours) of static posture and lifting of overload 86 (97.7%) as shown in figure 5.19. Sites inspection further revealed that 57 (64.8%) sites lacked appropriate sitting stools for workers as illustrated in figure 5.20.

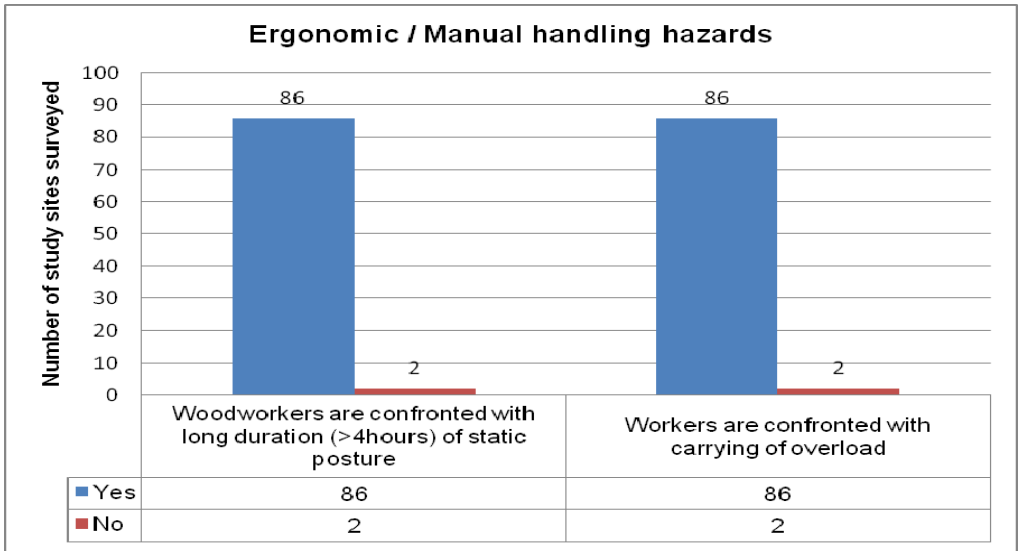

Figure 5.19 Ergonomic/manual handling hazards (N=88)

Figure 5.20 A photograph showing work without proper seating and workstation and poor storage of wood depicting lack of sitting stools and inadequate storage space

5.4 CONCLUSION

This chapter has presented and described findings from the study sites. The results of the current study have revealed the socio-demographic characteristics, knowledge and practice of some selected OHS aspects. The nature and magnitude of work-related injuries among woodworkers as well as the health and safety conditions of the study sites have also been statistically documented in this chapter. Pictures of important aspects observed that demonstrate the environmental conditions, infrastructural and

current practices in the study sites have also been presented as evidence in this section.

The subsequent chapter discusses the research findings emerging from the current study and their implication.

CHAPTER 6

DISCUSSION OF RESEARCH FINDINGS

6.1 INTRODUCTION

This chapter discusses the findings presented in the previous chapter. The chapter includes: discussions of findings on the socio-demographic characteristics of employees, knowledge and practices of OHS and nature and sources of work related injuries and diseases. Findings regarding the nature of the work environment among woodshops are also discussed in this chapter. Findings are presented in two parts; the first section discusses the findings from the interviewer-administered questionnaire and the second part discusses findings of data obtained from inspection using a structured checklist.

6.2 DISCUSSION ON RESEARCH FINDINGS

6.2.1 Discussion on findings from the questionnaire

This section discusses findings related to data collected from 223 respondents in 88 woodshops with focus on their socio-demographic profiles, Knowledge and practices of OHS, as well as the nature and sources of work-related injuries.

6.2.1.1 Discussion of findings relating to respondents' socio-demographic characteristics

6.2.1.1.1 Profile of the study sites

Findings showed that the number of persons employed per workshop ranged from 1 to 13 which is short of the 1-50 employees as specified in the initial definition of small-scale enterprises adopted in this study. This shows that businesses engaged in woodworking in the study area are mostly informal and operate on a small-scale consisting mainly of self-employed persons and lack the structural characteristics of formally run enterprises. These characteristics are vital in defining the extent to which

they comply with OHS requirements. In the same way, the size of a workforce sampled in a previous Nigerian study showed that the number of woodworkers ranged from 1 to 21 per woodshop (Alao & Kuje 2012:52).

6.2.1.1.2 Respondents' sex distribution

The findings revealed that the majority of woodworkers are male compared to female and had no impact on the self-reported injury rate ($P>0.05$). This implies that the workforce in the small-scale wood enterprises in the study sites is mostly male-dominated. This situation may be explained by the fact that the work is hard and laborious since the Cameroon Labour Code does not exempt women from woodworking ventures. Furthermore, employing women would require meeting their specific OHS needs. This also means that women may be underrepresented in decision-making to put forward their challenges and defend their rights. Earlier studies conducted among woodworkers also indicated that the profession is male-dominated. For instance, a cross-sectional study conducted in Malaysia among wood furniture and bamboo workers had almost all respondents being males, reflecting the low number of women employed in the wood industry (Ratnasingam et al 2016:1196). Similar studies conducted among woodworkers in Ghana and Nigeria also showed that a majority of the respondents were males (Alao & Kuje 2012:5; Effah et al 2013:124).

6.2.1.1.3 Respondents' age distribution

The age of the youngest and the oldest employees were 15 and 68 respectively with an average age of 28.2 years in the current study. This means that the woodworking enterprises in the study area employed mostly the young probably due to the hard labour required which might naturally limit the employment of elderly people. The findings also revealed that the age of the woodworkers had a significant impact on the knowledge of selected OHS and self-reported injury rate ($P<0.05$). The current findings are consistent with those of Rongo and Leon (2005:36), who reported that young people are the ones who can withstand the hardships involved in the whole process of woodworking activities. Most of the informal sectors and their operators are characterized by sole entrepreneurship, manual work and very often tremendous endurance. This needs young, strong and active people. Further, it can be argued that having older employees at the sites might contribute to a better understanding of OHS

instructions, a better perceptions of risk and less risk-taking, thereby improving compliance and promoting a more positive health and safety culture at work (European Parliament 2011:72; Government of Western Australia 2010:2; Nielsen et al 2013:228). The results were also similar to findings of a cross sectional study carried out in Tamale-Ghana to assess the occupational hazards and safety practices among woodworkers in small scale sawmilling industries which showed that most of the respondents were within the age range of 25-44 years (Ochire-Boadu et al 2014:235).

6.2.1.1.4 Respondent's level of education

Regarding education levels, findings showed that more than half of the interviewed respondents had no formal education or had completed only the primary level of education as compared to 24.3% who had acquired secondary education: 20.6% technical training and 1.8% tertiary level of education. The analysis also revealed that educational level of the woodworkers had a significant association with the practice of OHS ($P<0.05$). It has been argued that being educated increases access to information, education and communication materials, enables a better awareness of various workplace hazards and ensures an understanding of safe work procedures and a better propensity to develop a positive attitude towards OHS at work (Agbana et al 2016:31). These findings support the results of the previous studies that indicated that a majority of woodworkers in small scale and informal enterprises in Nigeria and Ghana have completed only primary education, hence they are largely unskilled, requiring apprenticeship to do their job (Mijinyawa & Bello 2010:154; Bolaji 2005:101; Ochire-Boadu et al 2014:235).

Findings of the current study have shown that an overwhelming majority of woodworkers were mainly trained through apprenticeship and had a statistically significant impact on the knowledge and practice of OHS ($p<0.05$). This implies that workers acquire their expertise through apprenticeship and experience on the job and are solely dependent on the trainer whose knowledge of OHS may be insufficient. The findings are in line with the study conducted by Agbana et al (2016:30) in Kwara State-Nigeria which revealed that almost all the woodworkers in the study (91.3%) received their training through apprenticeship.

6.2.1.1.5 Respondents' work experience

The findings showed that most of the respondents had worked for less than 5years and work experience was significantly associated with the practice of OHS ($p<0.05$). On average each worker had spent 8.2±6.7 years in the trade. This implies that the small-scale enterprises in the study sites employ mostly first time employees who have little or no experience. Therefore, regular training and close supervision is required given the fact that they are unfamiliar with their work environment and less likely to identify risks associated with the job. A survey conducted by Bolaji (2005:101) on carpenters noted a lower average year of work experience of 4.5 years and over 65.4% of the respondents had worked for five years. In addition, another study conducted in Nigerian woodworkers by Agbana et al (2016:30) reported higher average years of experience of 13.27±10.19 years though the statistically significant difference between these averages has not been verified.

6.2.1.1.6 Respondent's number of work days

Current findings show that on average, respondents work for 10.2 hours daily contradicting an earlier study by Rongo and Leon (2005:36) which showed that only very few woodworkers worked for more than 9 hours/day. A very small proportion of respondents worked for the normal eight (8) hour daily while a majority worked for more than eight (8) hours-day. This means that most employees work for long working hours without adequate rest. This might increase the risk of errors and decrease vigilance of workers thus increasing the risk of accidents. A similar study by Agbana et al (2016:29) conducted in Nigeria among sawmill workers showed that overwork or long hours of work leads to increased fatigue which is associated with a higher risk of accident at work.

Findings from this study equally point to the fact that a vast majority of respondents worked from six to seven days per week. It is worth noting that no workers reported paid overtime for extra days spent working. This suggests that workers work with respect to the amount of work they have at their disposal and instructions of their employers. A majority of woodworkers did not know the maximum acceptable working hours per day and might have exposed themselves to elevated level of hazards according to findings of a study conducted among woodworkers in Nigeria by Bello and Mijinyawa (2010:6).

6.2.1.2 Discussion of findings relating to respondents' knowledge and practices of occupational health and safety (OHS)

6.2.1.2.1 Respondents' knowledge of occupational health and safety (OHS)

The findings in the current study show that respondents' overall knowledge of OHS was poor. This implies that a majority of respondents lack basic knowledge of OHS concepts, knowledge of the use of PPE, safe operation and maintenance of work. Knowledge of OHS is one of the essential elements that must be present to build a positive health and safety culture at work. A better understanding of OHS is associated with fewer violations and hence fewer accidents (Cooper 2001:25). The lack of basic knowledge of OHS could further have been exacerbated by the low level of formal education of those interviewed thus mirroring results of previous studies carried out among woodworkers in Nigeria (Agbana et al 2016:29; Bolaji 2005:102; Osagbemi et al 2010:328). These authors revealed that a majority of woodworkers had poor knowledge of OHS. The present study contradicts a report by ILO (2001:8) which states that it is a legal requirement that employers must employ persons that are competent and who support all aspects of the organisational OSH management system.

6.2.1.2.2 Respondents' practice of occupational health and safety (OHS)

Current findings have revealed that a majority of the respondents have poor practices of OHS due to poor OHS training, inadequate provision and use of PPE, use of obsolete and poorly maintained work equipment and poor housekeeping practices in the study sites. The implication is that, most of the respondents were neither provided with PPE nor used safe equipment at work; for example, finding showed that they mostly used outdated equipment without safety guards and the equipment mostly repaired by incompetent persons. Furthermore, current findings showed that workers mostly worked in dirty and untidy workshops. Good practices in OHS generally require respondents to comply with OHS practices during the execution of their duties and leads to more positive health and safety culture among the workers and can significantly reduced both injury rates and costs at the workplace (Wolska & Namies'nik 2007:462). The current finding concurs with the previous research studies conducted in wood enterprises in Malaysia and Nigeria also reported poor practices of OHS among woodworkers

(Oppliger et al 2005:389; Osagbemi 2010:327; Ratnasingam et al 2016:1195). Authors of previous studies have indicated that woodworkers rarely use PPE such as face masks, protective goggle, hand gloves and boots for safety at workplace, which concur with current findings. The findings of this study are not in line with the ILO-OSH 2001 states that the employer should offer regular and effective initial and refresher OHS training to all employees at no cost that should take place preferably during working hours (ILO 2001:8).

6.2.1.3 Discussion of findings relating to the nature and sources of work-related injuries

Current findings showed a very high injury rate (86.1%) of work-related injuries among respondents with most of these injuries occurring within the workshop, indicating that most accidents are concentrated within the production area where workers are likely exposed to dangerous equipment. The rate of work-related injuries in the current study is slightly higher when compared to the rates, 83% that were found in a previous study in Nigeria among sawmill operators (Bello & Mijinyawa 2010:6). Present findings are in line with findings by Bello and Mijinyawa (2010:6) which revealed that majority of the accidents/injuries in Nigeria occurred within the sawmill yards.

Regarding the nature of work-related injuries sustained by respondents, current findings also show that most common injuries sustained were cut/open wound, sprain/strain, backache, chronic joint or muscle condition, fracture of the upper and lower limbs and burns/lacerations from carpentry, sawmills and Upholstery activities. This was proof that most workers do not use PPE to protect themselves, thus increasing the risk of sustaining an injury. Studies among woodworkers conducted in Nigeria and Zimbabwe have shown that higher injury rates are associated with non-compliance with OHS requirements such as failure to provide PPE, inadequate maintenance of equipment, long work hours without rest, and strenuous lifting, pulling and pushing of heavy loads (Mijinyawa & Bello 2010:151; Jinadu 1990:63; Steven 2012:279). Thus, these small workplaces have worse safety record and higher serious injury rates than large ones (Alli 2008:6; ILO 2009b:14). According to ILO (2001:11) and Robson et al (2007:333), compliance with health and safety requirements is effective in reducing workplace injuries and illnesses which are costly to employers.

A statistically significant association was also found to exist between self-reported injury rates and practices of OHS in the study sites surveyed in this study. This indicates that practice of OHS may be a major determinant of injury rates at the study site and might have contributed to the increasing injuries/accidents recorded at the study sites ($P<0.05$). Berhe, Yemane, Gebresilassie, Terefe and Ingale (2015:3) also offered a significant association between the safe practice in OHS and occupational injuries among small scale industries in Ethopia.

6.2.1.3.1 Treatment received for occupational injuries

In the current study, over half of the respondents who sustained work-related injuries received first aid treatment and few who had life-threatening injuries were taken to the hospital for serious medical attention. The study also showed that about one third of the employees took time off work due to work-related illnesses or injuries. Prolonged absences from work due to ill health may become costly for the employer who may have to spend more money to recruit and train temporary workers to cover the injured party, pay for injury claims and the subsequent increased insurance premiums. Also, the loss of working hours due to the inability of the injured worker to exercise their duties can significantly affect the productivity of workplace. An earlier study by Adu et al (2015:2684) conducted among woodworkers in Ghana revealed that most injuries were simple ones treated by suturing and dressing with few life-threatening injuries that warrant hospitalisation and major surgery and very few resulting in permanent disability.

6.2.1.3.2 Sources of occupational injuries as reported by respondents

The current study found out that a majority of the respondents that suffered from injuries indicated that this was due to carelessness/negligence on their part. Some other reasons reported in this study were lack of PPE or insufficient use of PPE, fatigue caused by overworking, lack of modern equipment and lack of skills or inexperience. The findings imply that employees were not constantly trained on OHS measures nor closely supervised by their employers/supervisors to reduce work-related injuries. Likewise findings from earlier studies (Effah et al 2013:126; Ochire-Boadu et al 2014:235; Steven 2012:279) conducted among woodworkers in Ghana and Zimbabwe have revealed that excessive workloads, use of obsolete equipment, non-use of PPE

and inadequate knowledge of OHS among workers are often major risk factors that heighten the recurrence of work-related injuries.

6.2.2 Discussion of findings from the inspection and observation checklist

6.2.2.1 Workplace conditions

6.2.2.1.1 Walkways

Over half of the study's workshops had narrow walkways with obstacle capable of causing workers to trip and fall, resulting in serious injury. This finding also confirmed a previous study by Colman et al (2007:45) who assessed the OHS problems among workers in wood processing enterprises in Gabon and reported that about half of the workers surveyed were exposed to slips and trip hazards due to narrow walkways with obstacles which often result in serious workplace accidents. The findings are in contrast with the WHOHWFM (2010:84) which requires employers to ensure the health, safety and wellbeing of woodworkers by eliminating or reducing the occurrence of physical hazards in the workplace.

6.2.2.1.2 Workplace facilities

According to the findings of this study, over one-third of the study sites were situated in enclosed dilapidated structures while a majority were situated in premises with only the roof or in an open space and located along main roads and streets. This study suggests that most of the study sites' workers worked in unsafe premises and were exposed to multiple health hazards. Similarly, studies conducted in Nigeria concluded that most small-scale and informal wood workshops are mostly located along the main roads, in streets and dilapidated structures and their activities are temporary with no distinction of homes and work place and therefore predisposing workers as well as neighbouring communities to elevated levels of injuries and diseases (Bello & Mijinyawa 2010:8; Judd & Wiedenbeck 2004:15).

6.2.2.1.3 Lighting and ventilation

In the current study, a majority of the sites inspected had inadequate lighting and ventilation. Woodshops which lack adequate lighting and ventilation have the potential to increase the risk of accidents, or force workers into awkward positions to see clearly what they are doing thereby exacerbating the risk of injury. In the same way, findings from Afolabi's (2014:31) study to evaluate the small scale industries including woodshops and reasons behind the low compliance to occupation safety standard in Nigeria, found out that about half of the woodshops did not have adequate ventilation and lighting.

6.2.2.1.4 Physical hazards

The current study found that a significant proportion of workers in the inspected sites were confronted with high vibration and noise. The study indicated that most workers carried out work procedures that used hand-held equipment and heavy planning equipment that exposed them to excessive levels of vibration (>2.5 m/s^2 per 8 hours working day) and high noise (>85db) that can cause Noise Induced Hearing Loss (NIHL). This implies that the employers did not carry out efficient and regular maintenance of equipment by lubricating and cleaning, replacing worn parts, maintaining proper belt tensions and proper balancing of blades and other rotating parts to maintain the machines in order to reduce vibration and noise. A comparable finding is reported in Steven (2012:282) in a Zimbabwean study on OHS problems among woodworkers, which showed that the problem of noise is still prevalent in a wide range of occupations including wood processing. Oluwatosin et al (2015:10) in a study conducted in Nigeria to assess the awareness of occupational hazards and health problems among sawmill workers, highlighted that sawmill machines are very noisy and verbal communication during operation of the machines is almost impossible which could lead to accidents. Findings contradicts WHOHWFM (2010:84) which emphasises that preventive and protective measures should be implemented in all workplace to eliminate hazards and risks, control hazards and risks through the use of engineering controls, administrative control and Personal protective equipment measures.

Analysis of data obtained from the inspection of environmental facilities and conditions in the study sites found that 11.4% of workers were exposed to excessive heat and UV radiation from the sun during hot seasons and excessive cold due to rain and storm during the rainy season. This could cause the body's cooling or heating mechanism to break down, leading to temporary or permanent disturbances in bodily functions (Workplace Safety and Health Council and Ministry of Manpower 2012:9). A survey to explore OHS problems among workers in the wood processing industries in Zimbabwe, reported heat as one of the major health hazards workers were exposed to in the woodworking sites and concluded that heat may result in acute and chronic health effects on the skin, eye and immune system (Steven 2012:280).

6.2.2.1.5 Chemicals hazards

Further findings from the current study showed that a majority of workers in the sites inspected were exposed to hazardous chemicals such as cellulose, hemicelluloses, lignin and hundreds of compounds known as "wood extractive" from wood dust, and maxine, xylene, diluant, vanish, painting oil mastic, methyl ethyl ketone (MEK), toluene, methyl isobutyl ketone (MIBK) and Methanol from synthetic chemicals used for wood processing. The inhalation of these chemicals in large quantities might cause nausea, irritation, asthma, allergic reaction, nasopharyngeal cancer, reproductive problems, central nervous system disorders and damage to the lungs, liver, and kidneys amongst others woodworkers (Work Bank Group 2007: 8). Studies conducted by Colman et al (2007: 45) and Rongo (2005:13) in Gabon and Tanzania respectively on woodworkers revealed the use and production of chemicals is common in woodshops and that all workers were highly exposed to at least one hazard in addition to the usual wood processing risks such as wood dust.

6.2.2.1.6 Fire safety and first aid availability

Current findings reported that there were inflammable material such as dry wood dust, bamboos thatches and gas lighters in the work environment which increase the risk of fire accidents. The present study also found that almost all the inspected woodshops lack basic preparedness such as appropriate fire extinguishers and first aid kits in case of fire accident and injury. Prompt first aid can help minimise the severity of work-related injuries and can also save the employer's money by reducing costs related to medical

treatment. This finding corroborates with results from a Nigerian study by Afolabi (2014:27) on small scale workers, which reported that very few small-scale enterprises (38%) owned appropriate fire extinguishers and first aids kits. On the contrary, ILO-OSH (2001:12) requires the employer to ensure that necessary information, internal communication and coordination are provided to protect employees in the event of an emergency. These arrangements should identify potential accident and emergency situations and address the prevention of occupational health and safety risks associated with them (ILO-OSH 2001:12).

6.2.2.2 Occupational health and safety training

Findings of the current study have revealed that most study sites have no evidence of workers OHS training and the knowledge acquired was based on the apprenticeship training and experience gathered on the job. In addition, most sites did not provide brochures and newspapers that give information on OHS issues to their workers. The training of employees in health and safety issues is an indispensable component of the health and safety management programme given the fact that most workers in the study sites are young. This ensures that workers assume their duties competently and safely, thereby strengthening a culture of prevention at work (ILO 2001:18). The findings of the study are consistent with a Nigerian survey carried out among 64 sawmill workers by Mijinyawa and Bello (2010:154) which revealed that none of the workers had attended any safety training throughout their job period and that the knowledge acquired was based on the apprenticeship training and experience gathered on the job.

6.2.2.3 The provision and use of personal protective equipment

This study has reported that the provision and use of PPEs at work is rare. This implies that employers do not conduct a hazard assessment of their sites to determine which hazards are present that require the use of PPE; it also means that employers do not provide workers with appropriate fitted PPE, or ensure that they use and maintain them in sanitary and reliable conditions. The non-use of gloves to protect hands from hazardous chemicals such as wood dust and paint, rough or sharp, nose masks to prevent breathing of wood dust; boots to protect feet from sharp objects such as nails and falling objects might have contributed to the occurrence of high injuries or accidents outlined in the current study. The present findings agree with a cross-sectional study

conducted among Nigerian sawmill workers revealed that only 34.0% of the respondents regularly used face masks as a safety device with a majority of them never using hand gloves , aprons, ear mufflers and lifters (Faremi et al 2014:1246). In addition, a study conducted among small-scale sawmilling industries in the Tamale metropolis of Ghana by Ochire-Boadu et al (2014:35), reported inadequate supply and discomfort as reasons for the low use of PPE at work. The findings differ with ILO-OSH 2001 which accentuates that employer should provide appropriate personal protective equipment (PPE) as well as protective clothing free of charge in situations where outstanding hazards or risks cannot be controlled. Furthermore, the employer should ensure that measures are implemented to ensure PPE use and maintenance ILO (2001:11)

6.2.2.4 Work equipment and maintenance

Most of the equipment used at the survey sites were obsolete and poorly maintained. The majority of the equipment never had safety guards, produced excessive noise and vibration, frequently broke down and mostly operated by inexperienced workers without close supervision and maintained by unqualified technicians. Thus, workers were frequently exposed to hazards with high risks of injuries or accidents. The current findings are similar to results of previous studies conducted in Nigeria and Ghana are also of opinion that the major risk factor easily noticeable in most of the wood industries is the age factor of the machines in use and that workers operated the machines without or inappropriate safety guards which could lead to serious injuries (Bello & Mijinyawa 2010:6; Effah et al 2013:126). This study findings contradict ILO-OSH 2001 which requires the employer to guarantee that hazards are prevented, eliminated, controlled and minimised (ILO 2001:11). Also, these hazards should be reviewed and modified on a routine basis if deemed necessary (ILO 2001:12).

6.2.2.5 Housekeeping aspects

This study has reported that housekeeping practices were poorly carried out in most of the inspected sites. Work areas were dirty due to inadequate cleaning and poor or lack of daily disposal of wood dust and used nails from the floor. Very few sites had waste receptacles and disposal duties allocated to specific persons. The workshops also had limited space for free circulation of workers and packing of both processed and

unprocessed wood products. In addition, workers were constantly exposed to pierce projecting objects such as nails on the floor and easily hit by falling objects due to poorly stacked planks. A study by Colman et al (2007:45) on occupational health and safety problems among workers in wood processing enterprises in Gabon revealed that in addition to the usual wood processing risk hazards, woodworkers were frequently exposed to sharp metals and objects, flying and falling objects due to poor health, safety and hygienic conditions in the woodshops, a finding matches with that of the current study.

6.2.2.6 Ergonomic/manual handling hazards

Going by the findings from the inspection survey in the current study, most workers in the inspected workshops bend uncomfortably to push, pull and lift heavy logs of planks onto the work table. They maintain the same standing position for hours and extreme work posture to plane and sandpaper the wood. This accumulated stress in their low back which could result in fatigue and lead to musculoskeletal injuries to woodworkers. This finding is in tandem with a Ghanaian study conducted by Adu et al (2015:2679) on woodworkers also revealed that almost all the wood factory floor workers pushed, lifted or jacked heavy lumber onto the work table using the same posture and this accumulated stress in their lower back causing pains.

6.3 CONCLUSION

This chapter has presented the discussion from the findings in this study. It dwelled a great deal on the socio-demographic characteristics of the study site, knowledge and practice of OHS, the nature and magnitude of work-related injuries and diseases and the inspected working conditions of study sites. The relevance of complying with health and safety legislation was emphasised as well as its consequences on productivity due to time lost as a result of injuries, illnesses and absenteeism caused by lack of compliance.

Based on the discussion of findings, there is need to develop recommendations based on the understanding of OHS challenges encountered by these woodworkers. The next chapter presents the conclusion, limitation and recommendations of the study.

CHAPTER 7

SUMMARY, CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS OF THE STUDY

7.1 INTRODUCTION

This chapter presents the summary of the study, conclusions arising from the discussion of the findings, the contributions of the study and its limitations. The chapter also presents the recommendations for improving OHS among small scale and informal wood enterprises in Cameroon, suggestions for further research and concluding remarks.

7.2 SUMMARY

The purpose of the study was to investigate the OHS challenges among small scale and informal wood workers in the Fako division of Cameroon and to develop evidence-based guidelines for the improvement of health and safety conditions in the study areas. This study took place in five main cities of the Fako division namely: Tiko, Muntegene, Buea, Ekona and Muyuka. Data were collected using (i) an interviewer-administered questionnaire administered to workers in the study sites to describe the socio-demographic characteristics of workers, Knowledge and practice of OHS and investigate the nature and magnitude of work-related injuries and diseases as reported by respondents.and (ii) an inspection checklist to inspect the environmental conditions at the study sites. The reviewed literature revealed the unhealthy and unsafe circumstances under which woodworkers work, the nature and sources of occupational injuries and diseases and other hazards they face.

7.2.1 Conclusions arising from the discussion of the findings

The findings of the study revealed an overwhelming non-compliance with the health and safety regulations among woodworkers in the study area. These research findings attest to the fact that a sound knowledge and best practices of OHS might create a positive safety culture at work. Most employers had not ensured that their employees are

adequately aware of health and safety issues. Also, employees worked under poor working conditions leading to untold injury rates.

7.2.1.1 Findings related to respondents' demographic profile

The findings reveal that the study sites were male dominated with a majority of the workers being young, with an average age of 28. Also, a majority of the woodworkers had completed just the primary education and mostly acquired woodworking skills through apprenticeship. The highest number of respondents had less than five years of work experience.

The findings also uncovered that on average, respondents worked for 10.2 hours daily in contravention of Section 80 of Order No. 92/007 of 14 August 1992 of the Cameroon labour code, which states that the statutory hours of work in all public and private non-agricultural establishments may not exceed forty hours per week while for agricultural and allied undertakings, the hours of work are based on a total of two thousand four hundred hours per year, within the maximum limits of forty-eight hours per week.

The findings from this study equally point to the fact that a vast majority of respondents worked from six to seven days per week. It is worth noting that no workers reported paid overtime for extra days spent working. This is also contrary to Section 88 (1) Order No. 92/007 of 14 August 1992 of the Cameroon labour code which states that weekly rest shall be compulsory and it shall consist of at least twenty-four (24) consecutive hours each week. Such rest shall fall as a rule on Sundays and may under no circumstances be replaced by a compensatory allowance.

7.2.1.2 Findings on knowledge and practice of occupation health services among respondents in study sites

In the current study, respondents' overall knowledge and practice of OHS was poor. This is due to the lack of effective OHS training service offered to both new and existing workers. This resulted in most workers being unaware of health and safety practices required at work, thus risking exposure to occupational hazards.

7.2.1.3 Findings related to the nature and magnitude of work-related injuries and diseases

The present findings made known an alarming injury rate of 86.1% among woodworkers with most of these injuries occurring within the production area of the workshop. This indicates that most accidents are concentrated within the production area where worker are exposed to dangerous equipment. The most common injuries sustained were cut/open wound, sprain/strain, backache, chronic joint or muscle condition, fracture of the upper and lower limbs and burns/lacerations from carpentry, sawmills and upholstery activities.

The practice of OHS Self-reported injuries rate had a significant impact on the self-reported injury rates. This indicates that OHS practices may be a major determinant of injury rate at the study site and might have contributed to the elevated injuries/accidents recorded at the study sites.

Findings related to treatment received for occupational injuries

These findings reported that over half of the injured woodworkers received first aid and few who had serious injuries were taken to the hospital for proper medical attention. The study also revealed that about one third of the employees took time off work due work-related illnesses or injuries

Findings related to sources occupational injuries as reported by woodworkers

Going by the findings, most of the woodworkers that had injuries reported that it was as a result of carelessness/negligence on their part. Some other reasons discovered in this study included: lack of PPE or insufficient use of PPE, fatigue caused by overworking, lack of modern equipment and lack of skills or inexperience.

7.2.1.4 Findings on workplace safety

According to the findings in this study, over half of the workshops had narrow walkways with obstacle that can cause workers to trip and fall resulting in serious injury. Over one-thirds of the study sites were situated in an enclosed dilapidated structure while a

majority were situated in premises with only the roof or in an open space and located along the main roads and streets. In addition, most of sites inspected had inadequate lighting and ventilation. Also, almost all the workers were confronted with loud noise and vibration, excessive heat and UV radiation from the sun and excessive cold due to rain and storm during the rainy season. Furthermore, workers were exposed to hazardous chemicals such as wood dust and synthetic chemicals used for wood processing.

Findings related to fire safety and first aid availability

The present study also claims that almost all the inspected woodshops lack basic preparedness such as appropriate fire extinguishers and first aids in case of fire accidents and other injuries.

Findings related to the OHS training

One of the findings of the current study is that most study sites had no evidence of OHS training for workers and the knowledge, if acquired was based on the apprenticeship training and experience gathered on the job. In addition, most of sites did not provide brochures and newspaper that give information on OHS issues to their workers.

Findings related to the provision of PPE

Findings of the present study reported that the provision and use of PPEs at work was very rare. This implies that employers do not conduct hazard assessment of their sites to determine what hazards are present and that require the use of PPE. Employers also do not provide workers with appropriately fitted PPE, nor ensure that they use and maintain them in sanitary and sustainable conditions.

Findings related to the work equipment and maintenance

Most of the equipment used at the surveyed sites was obsolete and poorly maintained. A majority of the equipment never had safety guards, produced excessive noise and vibration, frequently broke down and were mostly operated by inexperienced workers without close supervision and maintained by unqualified technicians. Thus, workers were frequently exposed to hazards with high risks of injuries or accidents.

Findings related to housekeeping aspects

This study also recorded that housekeeping aspects were poorly carried out in most of the inspected sites. Work areas were dirty due to inadequate cleaning and poor or non-disposal of wood dust and used nails from the floor daily. Very few sites had waste receptacles and disposal duties allocated to specific persons. The workshops also had limited space for free circulation of workers and packing of both processed and unprocessed wood products. In addition, workers were constantly exposed to pierce projecting objects such as nails on the floor and easily hit by falling objects due to poorly stacked planks. These caused many injuries.

Findings related to manual handling hazards

The inspection revealed that most workers in the inspected workshops bend awkwardly to push, pull and lift heavy logs of planks onto the work table. They maintain the same standing position for hours, and extreme work posture to plane and sandpaper the wood. This accumulated stress in their low back which could result in fatigue and lead to musculoskeletal injuries to woodworkers.

General conclusion

OHS issues have been a major challenge to woodworkers especially those working in the small scale and informal sector. The aim of the study was therefore to investigate the OHS challenges faced by woodworkers employed in small scale and informal wood industries in Fako division. To that end, the purpose of the study was achieved. The evidence-based guidelines developed using key elements of the Health Organization Healthy Workplace Framework and Model (WHOHWFM) would improve health and safety conditions among woodworkers in small scale industries in Fako division.

7.3 RECOMMENDATIONS DERIVED FROM THE CONCLUSIONS AND FUTURE RESEARCH

Based on the conclusions of the current study, the following recommendations were made that would enable small-scale and informal wood enterprises in the Fako division of Cameroon comply with basic OHS standards:

7.3.1 Recommendation to employers on compliance with health and safety legislation

7.3.1.1 Working hours of employees

- Employers should respect the 8 hours per day allocated for work by the legislature with appropriate rest/break period. In addition, work should not extend to Saturdays and Sundays. This should enable employees have a good rest and the respect of the religious right.

7.3.1.2 Knowledge and practice of occupational health services among employees

- Employers should also provide pre-employment OHS training to newly recruited workers to enable them understand the health and safety challenges that await them in the profession.
- Employers must provide continuous training to employees on the relevance and use of PPE, and electrical equipment. Then on a rotational basis or with representatives involve employees in the selection of recommended types of the protective clothing they are using. Prizes could be awarded to the most complying individual employees to encourage the use of PPE.
- Employers must comply with the requirements of health and safety legislation by having a copy of the Cameroon Labour Code (Decree 039/MTPS/IMT dated 26 August 1984) concerning the relevant regulations in all workplaces. They should also paste relevant sections at the workshops for view by all workers to improve on their awareness of the health and safety legislation at the workplaces.

7.3.1.3 Nature and magnitude of work-related injuries and diseases

- Employers must put in place measures to mitigate against hazards in woodshops, especially through the provision of appropriately fitted PPE for workers and the supervision of the efficient use of the PPE by workers. They should also adopt the attitude of purchasing up-to-date equipment with safety guards and make sure the equipment are regularly checked and repaired by a competent person to reduce vibration and sound. They need to equally prohibit the use of dangerous tools such as spinning machine by workers who have not been sufficiently trained on how to operate it. Employers must treat all injured workers and pay all workers on sick leave.
- Supervisors should strictly supervise workers to make sure they are vigilant at work and follow working instructions. Woodworkers in the woodshop must report hazards identified to the employer or a supervisor.

7.3.1.4 Workplace safety

- The employers must make sure the workplace is well organised with adequate working space, tidy environment and have a proper waste management system. Furthermore, employees should be encouraged to clear the escape ways from all obstacles. Hazardous chemical must be properly labelled and stored in recommended containers.
- First Aids Kits and unexpired fire extinguisher must be available at the workshop as stipulated by the legislation in force.
- Employers must make available adjustable working stools to reduce the long duration of static posture. They should also encourage employees to split heavy loads into small and equitable bits before transportation to prevent injuries.

7.3.2 Recommendations to the government

7.3.2.1 Workplace safety

- There is need for the Government of Cameroon to adopt a new more comprehensive OHS legislation that includes provisions adapted to the

characteristics and needs of woodworking activities especially small and informal enterprises. They should also introduce incentives to conformist employers to induce the adoption of OHS culture in their business practices.

- The Ministry of Labour and Social Security should develop and implement strategies to ensure that OHS legislation is effectively implemented and enforced. This can be done through the creation of a competent body to put in place measures to ensure that small-scale and informal woodworkers can benefit from the health and safety protection afforded by the ministry. These measures include: (i) guaranteeing compliance with regulations, (ii) disseminating information and addressing hazards and risks in woodshops, (iii) developing appropriate educational programmes and materials, and providing OHS training for woodworkers concerning work-related hazards.
- The Ministry of Labour and Social Security should also encourage small enterprises to group themselves into small bodies and create their own health and safety committees with elected members representing employers and workers who are then trained in basic OHS procedures by experts from the Ministry of Labour and Social Security. These will create a forum for information dissemination during their meetings.
- The council should construct woodshops with ample working space, sanitary facilities and good water drainage systems far from residential quarters to prevent the intoxication of the neighbouring communities with wood dust.
- The labour inspectors need to increase the number of systematic and continuous workplace health and safety inspections with the emphasis on the provision of advisory and information services for improvement.
- Lastly, the government needs to provide financial assistance for ergonomically designed tools and personal protective equipment such as, goggles, safety boots, gloves, and respirators.

7.3.3 Recommendations for further studies

The researcher recommends a country-wide survey by considering the country's other divisions for a holistic understanding of the OHS challenges faced by small-scale and informal woodworkers in Cameroon. In addition, a qualitative study on the occupational health and safety challenges of the workers will deepen the understanding of these challenges. More research is required after the implementation of guidelines developed

in the current study to evaluate its effectiveness in curbing injury rates and to establish the status of OHS in the woodworking setting.

7.4 CONTRIBUTION OF THE STUDY

The aim of this study was to investigate the nature and magnitude of health and safety challenges experienced by workers in small-scale and informal woodworking enterprises and to develop health and safety guidelines to enable woodworkers to comply with the Occupational Health and Safety regulation (Decree 039/MTPS/IMT dated 26 August 1984) that applies to all workplaces in all the sectors of the Cameroonian economy. These simplified guidelines are based on the WHO Healthy and Workplace Model on the implementation of a healthy workplace programme. These guidelines will thus be useful to workers in the small-scale and informal woodworking enterprises in Cameroon to enable them comply with the health and safety regulations that govern the woodworking sector.

The study also creates baseline data for small-scale and informal woodworking enterprises in Cameroon which is currently lacking. Furthermore, this study has identified major risk factors in informal woodworking workplaces and mapped a possible pathway for future research endeavours.

7.5 LIMITATIONS OF THE STUDY

Limitations refer to restrictions in a study that may reduce the generalisability of the study results according to Grove et al (2013:598). Despite all efforts made by the researcher to produce quality findings, there exists some limitations that must be highlighted from the study. They include:

- Only a structured interview questionnaire and an observation guide using checklists were used to collect data. Other approaches such as in-depth interviews could have revealed different results regarding the nature and extent of challenges faced by woodworkers in the small-scale and informal setting.
- The study units (woodshops) that were included in the study were from some major towns of Fako division in the South West Region of Cameroon and fifty three other divisions in Cameroon were not included in this study. Thus, the

geographic limitations could possibly deter the findings and inferences made from the study to be generalised to other divisions in the region and country at large.

7.6 CONCLUDING REMARKS

The chapter has presented a summary of the key findings of the current study. Conclusions and recommendations drawn from the significant findings have also been presented. The subsequently chapter summarises the guidelines for the implementation of an effective occupational health and safety programme and safety guidelines to assist woodworkers to comply with the health and safety legislation within the small-scale and informal woodworking sector in Cameroon.

CHAPTER 8

GUIDELINES FOR PROMOTING OCCUPATIONAL HEALTH AND SAFETY PRACTICES IN THE SMALL-SCALE AND INFORMAL WOODWORKING ENTERPRISES IN THE FAKO DIVISION OF CAMEROON

8.1 INTRODUCTION

This chapter presents the guidelines for promoting OHS practices in small-scale and informal woodworkers in Cameroon. The chapter begins by describing the purpose of the guidelines and further explains the processes followed in developing the guidelines. The guideline design was based on the main findings of the study, theoretical framework of the research and the related literature review conducted. Lastly, the chapter describes the recommendation for the implementation of guidelines and the dissemination plan.

8.2 PURPOSE OF THE GUIDELINES

The purpose of the guidelines is to promote health and safety practices in the small and informal wood enterprises especially in the Fako division of Cameroon by ensuring that the challenges and needs originating from surveyed work settings are properly attended to. It also aimed at facilitating the incorporation of both workers and managers in decisions making regarding their health and safety in order to establish a *sustainable and healthy workplace.* Good interaction between the manager and employees enhance team communication and collaboration, and encourage employees to accomplish the mission and objectives assigned by the organisation, which in turn enhances job satisfaction and reduce counter-productive behaviours.

8.3 SCOPE OF THE GUIDELINES

These guidelines are applicable to all small and informal wood enterprises located in the Fako division of Cameroon, which workers are vulnerable to various risks and hazards at their work settings. It can also be applicable to all woodworking personnel

irrespective of age and gender in the South West Region of Cameroon in particular and other Cameroonian regions in general to the extent that they face similar hazards and risks at their woodshops.

8.4 PROCESS OF DEVELOPING THE GUIDELINES

For the purpose of developing the guidelines for health and safety management in small-scale and informal enterprises, the study first investigated the OHS challenges and needs of woodworkers using a quantitative approach. The proposed guidelines were formulated based on the main findings of the current study. Furthermore, the development of the guidelines was guided by the theoretical framework outlined in chapter 3 and the review of related literature. The concepts of the theoretical framework were used to provide structure in each of the guidelines. The literature reviews for the development of these guidelines focused on compliance with health and safety regulations from a legislative standpoint.

8.4.1 Description of the healthy workplace model

The WHOHWFM contains the avenues of influence for a healthy workplace, continual improvement process and the core principles. The four avenues of influence which are the core principles of a healthy workplace are the physical work environment, psychological work environment, the personal health resources avenue and enterprise community involvement.

All the WHOHWFM four avenues of influence for a healthy workplace are relevant for this study and are included in the guidelines development process. The sub-components of the WHOHWFM components were also taken into consideration and applied to the relevant issues raised in the study to guide the development procedures and activities of the guidelines.

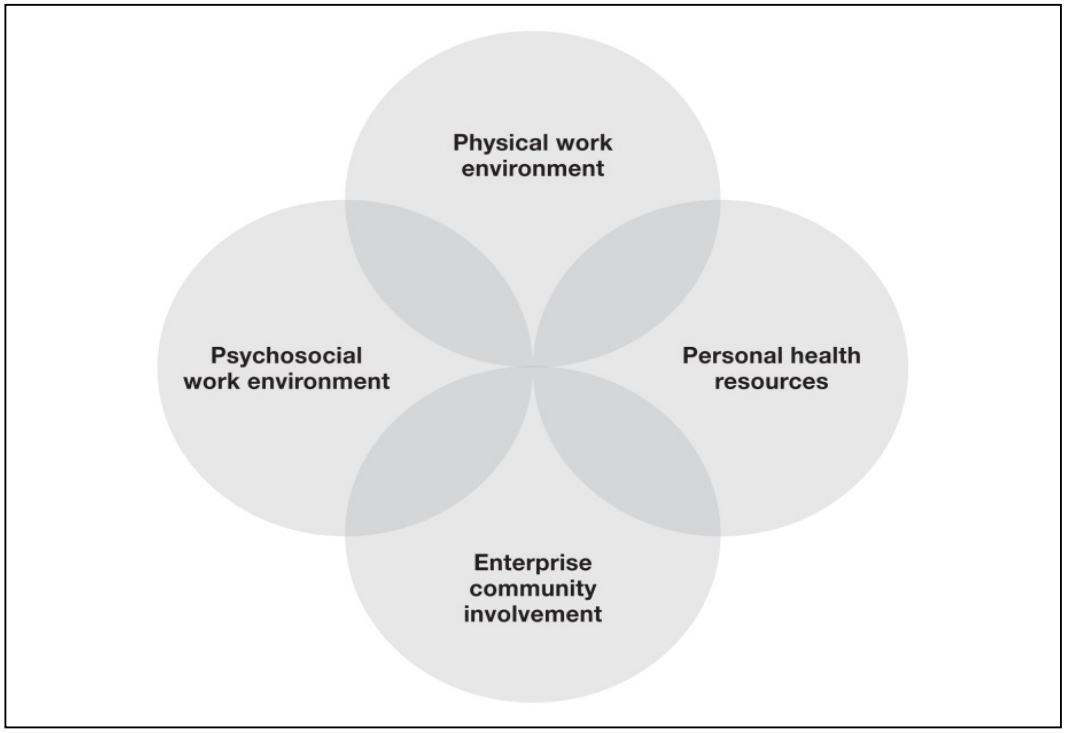

Figure 8.1 The simplified WHO four avenues of influence

(Burton 2010:83)

The WHOHWFM suggests a flexible, evidence-based framework for healthy workplaces that can be applied by employers in collaboration with workers regardless of the sector or size of the enterprise, the level of development, regulatory or cultural background of the country (Burton 2010:1).

Table 8.1 hereunder depicts the alignment of key challenging areas with specific aspects of the WHOHWFM, both of which are aligned to particular findings obtained in the current study, the specific purpose of the guideline and the actual recommended evidence-based guideline statement. These guidelines are described in easy-to-understand language to ensure meaningful use by small woodshop owners and employees, and are primarily intended to provide basic tools for managing and promoting workplace health and safety as stipulated in the Occupational Health and Safety Law.

8.4.2 Why small-scale and informal workplaces should implement the WHO healthy workplace framework and model (WHOHWFM)?

Unlike South Africa which has small-scale industries, some of which are informal but implement a system based on ILO-OSH 2001 or the Proprietary model OHSAS 18007 for larger industries, this is not the case with Cameroon. The South African context is completely different from that of Cameroon in the sense that, the SMEs or the informal sector makes up almost 70% of the economy of Cameroon. Literature review findings shows that these informal sectors are less likely to afford standard OHS workplace management. This probably explains why the simplified WHOHWFM was used to develop guidelines which these small scale and informal businesses can implement to improve health and safety in their settings.

8.4.3 Requirements for the effective implementation of the guidelines

The effective implementation of guidelines requires the enterprise to have some common features that are regarded as essential components for success. According to Burton (2010:62), the implementation of the WHOHWFM requires good organisational commitment through the implementation of the existing OHS policies, leadership engagement and commitment towards providing an effective OHS system, involvement of workers and their representatives in a meaningful way in every decision making level concerning OHS issues and to ensure worker commitment towards occupational health and safety promotion as well as an enabling culture and environment that sustains good OHS practices.

Table 8.1 Tabular presentation of evidence-based guidelines for promotion of health and safety for small scale wood industries in Fako division of Cameroon

Key areas of challenge to the woodworkers	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Respondents' questionnaire)	Proposed/recommended guidelines
	The physical work environment avenue			
Exposure to physical hazards in the workplace	Physical hazards The physical hazards in the workplace make it unsafe and can be very harmful to workers.	To promote the health, safety and wellbeing of woodworkers by eliminating or reducing the occurrence of physical hazards in the workplace as recommended in the WHOHWFM.	Most woodshops had narrow walkways with obstacles such as electrical cables and stacked wood obstructing the pathways and free movement of workers.	Structural design of workshops buildings should be standardised to have ample working space and free pathways for movement of workers HIRAs should be conducted to provide appropriate PPE for use in these conditions
			A majority of workshops were found to be mostly located along the main roads, in streets and dilapidated structures whose activities are temporary	The council should construct woodshops with ample working space, sanitary facilities and good water drainage system in specially designated industrial locations far from residential quarters to prevent the intoxication of the neighbouring communities with wood dust.
			Workers were found working in open air workshops exposing themselves to Incremental weather condition such as excessive heat and UV radiation from	Proper and standard woodshops that meet the construction norms should be constructed to shelter the workers prevent them from exposure to incremental weather conditions.

Key areas of challenge to the woodworkers	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Respondents' questionnaire)	Proposed/recommended guidelines
			the sun during the dry season and excessive cold due to rain and storm during the rainy season.	
			Woodshops lack adequate lighting with the use of mainly daylight conditions as lighting for work operations and did not improve lighting neither by providing artificial nor spot lighting on machines to cover period of darkness.	Adequate lighting should be provided by making full use of natural light, by installing windows, skylights and spot lighting on machines to cover period of darkness. Ensuring that there is an effective maintenance and replacement programme in place
			Woodshops had insufficient or inadequate ventilation as a result of poor circulation of air due the non-use or use of small windows and single doors at the workshops.	Moderate windows or other openings to allow air circulation in the workplace should be created to allow sufficient natural ventilation.
			Woodworkers were exposed to excessive levels of vibration and loud noise from hand-held equipment and heavy worn-out planning machines respectively.	The efficient and regular maintenance of equipment by lubricating and cleaning, replacing worn parts, maintaining proper belt tensions and proper balancing of blades and other rotating parts to maintain the machines in order to reduce vibration and noise. Reducing the speed of operation of the equipment to the slowest consistent level.

Key areas of challenge to the woodworkers	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Respondents' questionnaire)	Proposed/recommended guidelines
				Applying vibration-damping materials to all resonating surfaces. Workers should be adequately trained on hazards of working with vibrating tools with emphasis on the sources of vibration exposure, early signs and symptoms of hand-arm vibration syndrome, and work practices for minimising vibration exposure such as not to grip a vibrating tool too tightly. Arrange work tasks so that vibrating and non-vibrating tools can be used alternately and limit the number of hours a worker uses a vibrating tool during the workday. Also, employers should install noise buffers on noisy equipment and provide earplugs to workers.

Key areas of challenge to the woodworkers	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Respondents' questionnaire)	Proposed/recommended guidelines
	The physical work environment avenue			
Exposure to chemical hazards in the workplace	Chemical hazards The presence of chemical hazards in the workplace makes it unhealthy for workers.	To promote the health, safety and wellbeing of woodworkers by eliminating or reducing the chemical hazards in the workplace as recommended in the WHOHWFM.	Most of sites' workers were found to be exposed to hazardous chemicals such as wood dust and diluents.	Employers should set up local exhaust ventilation to remove toxic wood dust and other toxic gases before it reaches the worker. Employers must provide appropriate respiratory protection (for example respirators or nose mask (s) at no cost to workers as well as provide appropriate training and education regarding its use, and ensure that workers use it properly. People with skin sensitive to certain wood dusts should wear suitable protective clothing, e.g. overalls, long sleeves, and properly fitted industrial gloves. Dusty tasks rotation should also be implemented to reduce workers' exposure times. Workers should wash their hands and arms before eating or smoking, especially if handling treated wood. Workers and employers should ensure regular cleaning of work areas.

Key areas of challenge to the woodworkers	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Respondents' questionnaire)	Proposed/recommended guidelines
			Most of the sites had unlabelled and improperly stored containers of hazardous chemicals used for preservation and processing of wood.	The employer should ensure that all hazardous chemicals in their workplaces must have labels and safety data sheets for their exposed workers, and train them to handle the chemicals appropriately. The training for workers must also include information on the hazards of the chemicals in their work areas and the measures to be used to protect themselves.
	The physical work environment avenue			
Exposure to ergonomic hazards.	Ergonomic hazards. The WHOHWFM stipulates that the health and safety of workers in the workplace can be compromised by the presence of ergonomic hazards in the physical work environment which makes the workplace unsafe.	WHOHWFM promotes the health, safety and wellbeing of woodworkers by eliminating, substituting or reducing the exposure to ergonomic hazards in the physical work environment.	Most of the sites' employees were confronted with long duration (>4hours) of static posture.	Provision of adjustable and comfortable work stations such as sitting stools at workplace for workers. Work methods should be designed to reduce static, extreme, and awkward postures.
			Workers were regularly confronted with the use of excessive force for the lifting, pushing or pulling of heavy objects.	Provision of assistive devices to help woodworkers with lifting, moving and transfer of heavy load to avoid injuries to the back. Woodworkers should be regularly trained on techniques of proper bending and splitting of heavy objects before lifting, so as to avoid hurting their backs.

Key areas of challenge to the woodworkers	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Respondents' questionnaire)	Proposed/recommended guidelines
	Occupational injuries in the physical work environment			
Occurrence of occupational injuries	The WHOHWFM warns that the health and safety of workers in the workplace can be compromised by the occurrence of occupational injuries in the physical work environment which makes the workplace unsafe.	To prevent or reduce occupational injuries to the barest minimum at workplace as recommended by the WHOHWFM.	Hitting or being hit or cut by an object were found to be the highest cause of occupational injuries.	Proper packing of wood and the regular use PPE to ensure maximum protection.
			Workers were regularly confronted with the use of excessive force to lift, push or pull heavy objects.	Provide assistive devices to help woodworkers with lifting, moving and transferring of heavy loads to avoid injuries. Woodworkers should be frequently trained on techniques of proper bending and splitting of heavy objects before lifting, so as to avoid hurting their backs.
			Incomplete and inaccurate records of occupational injuries.	The employer should ensure good record keeping of recoded injuries sustained at workplace.
			Lack/insufficient use of Personal Protective Equipment (PPE) were the main reasons reported by respondents for high injuries.	The employer should ensures adherence to OHS regulation by regularly providing PPE to workers and closely supervising to make sure they are constantly and appropriately used to prevent injuries. Experts should also be invited to train

Key areas of challenge to the woodworkers	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Respondents' questionnaire)	Proposed/recommended guidelines
				workers on the safe use of PPE to prevent injuries.
			Carelessness was also reported as a source of injury.	Supervisors should ensure the regular use of PPE by workers where it is recommended. Workers should be educated on the relevance of the constant and correct use of PPE.
			Respondents reported fatigue caused by overworking as a source of injury.	Employers should adhere to Section 80 of the Cameroon Labour Code and limit the working hours to a maximum of 8 hours per day. Rest breaks should be enforced with the provision of rest rooms and appropriate facilities where workers can rest during break.
			Lack of modern equipment was found to contribute to high injury rates.	Employers should buy functional equipment and get an expert to train workers on their use and maintenance to minimise injuries.
			Lack of skill or inexperience was also one of the sources of injuries as reported by respondents in the study sites.	Employers should recruit competent workers and provide pre-employment OHS training to ensure that workers assume their duties competently and safely, thus strengthening a culture of injury prevention at work.

Key areas of challenge to the woodworkers	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Respondents' questionnaire)	Proposed/recommended guidelines
	OHS policy existence and compliance – physical work environment avenue			
OHS policy existence, implementation and compliance.	The WHOHWFM argues that the health and safety of workers in the workplace can be compromised by the absence of OHS policies and non-compliance hazards in the physical work environment which makes the workplace unsafe.	To encourage woodshops to develop OHS policy with one of the requirements involving the conducting of workplace risk assessments.	Most inspected sites never had appropriate fire extinguishers and had no available evidence of conducting fire safety drills and plans. Most of the workshops were constructed with fire flammable materials such as wood.	Employer must ensure readily accessible, portable fire extinguishers fully charged with fire retardants, appropriate to the types of fires likely to occur in wood workshops. Establish emergency fire safety drills and prevention plans. Fire-resistant construction and/or fire-resistant materials. Provision of multiple emergency exits that are well marked and easily accessible. These exits should lead people directly away from the areas of likely hazard. Installation of emergency alarms and communication systems to promote rapid evacuation and a fire fighting response.
			First aids kits were not available in most of the study sites for the management of accident cases. None of the study sites had a	All sites must possess valid first aid kits that comply with the OHS regulation with regards to the contents of first aid boxes for the management of accident cases. Ensure regular checking of the boxes and replacement of expired items. Develop first aids training program with

Key areas of challenge to the woodworkers	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Respondents' questionnaire)	Proposed/recommended guidelines
			first aider with neither training evidence nor a valid first aid certificate.	relevant stakeholders particularly employees once their knowledge and behaviours are assessed.
			The study revealed that, most of the woodworkers had very poor knowledge relating to OHS.	Provision of pre-employment OSH training to newly recruited workers to enable them understands the health and safety challenges that await them in the profession.
			Study sites had no evidence of workers' training.	Develop a complete and accurate record keeping system and ensure that the names and dates of all workers who receive OHS training are kept with the names and accreditation of the company that provided training in accordance with the regulation.
	The psychosocial work environment avenue			
Psychological stress due to poor work organisation.	A stress free work environment ensures the psychological well-being of workers which is required for the effective work and high productivity as recommended in the WHOHWFM.	To designs and manages work in a way that avoids common risk factors for stress and prevents as much as possible foreseeable problems.	The findings revealed that most employees work for long working hours without adequate rest.	Employers should comply with Section 80 of the Cameroon Labour Code and limit the working hours to maximum of 8hours per day. Rest break should be enforced with the provision of rest room and appropriate facilities where workers can rest during break.

Key areas of challenge to the woodworkers	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Respondents' questionnaire)	Proposed/recommended guidelines
	The personal health resources avenue			
Lack of provision of services for personal health	The WHOHWFM obliges employers to provide workers with supportive environment, health services, information, resources, opportunities and flexibility to support or motivate workers for their efforts and to improve or maintain healthy personal lifestyle practices.	To encourage employers to monitor and support the promotion programmes on the physical and mental health of woodworkers through the provision health services, opportunities and resources in the workplace.	Woodworkers were not provided with personal health services within the workplace and these services ensure that their personal well-being is well taken care of.	Woodworkers need to be allowed to access personal health services, such as basic treatments of injuries sustained at work. Woodworkers should be screened periodically for occupational diseases within their workplaces to encourage early detection and treatment of health deviations, and to alleviate the anxiety and stress of not knowing their health statuses. Provide counselling services to help woodworkers with personal issues that impact on psychological health and might spill over to the workplace. And also to help woodworkers cope with work-related stressors. Employers should provide woodworkers with knowledge or resources for prevention of sexually transmitted diseases (STDs) which may result in high levels of HIV infection or other sexually transmissible diseases.

Key areas of challenge to the woodworkers	Aspects of the WHOHWFM	Purpose of the guideline	Findings from the study (Respondents' questionnaire)	Proposed/recommended guidelines
	Enterprise Community Involvement			
Lack of community involvement.	The WHOHWFM suggests that the physical and mental health, safety and well-being of workers and their families can be compromise by the community problems/issues in which the enterprise operates.	To encourage enterprises to get or provide services to the social and physical community in which it operates as recommended by the WHOHWFM.	Lack of available qualified safety representatives and a health and safety committee.	Developing a health and safety training programs with relevant stakeholders particularly qualified community members. Encourage both woodworkers and civil society activists to establish health and safety committees to defend the rights of workers.
			Workplaces lack adequate drainage systems for waste and running water.	Construction of proper drainage system for waste and running water for both the woodshop and neighbouring home. Sensitise the community through health and safety forum on the importance of quarterly cleaning exercises.

8.5 DESCRIPTION OF IMPLEMENTATION PLAN FOR THE GUIDELINES

The researcher will explain the healthy workplace concept to the owner of woodshops and get permission to proceed with the holding of short meetings with the workers to implement designed guidelines. The contact meeting with the heads/employers should help to get them committed to providing enough of their time to plan and implement the programme. The research will help the employers to plan some short-term activities to address smaller projects or immediate high priority needs.

The implementation of the guidelines will commence in the study sites to enable its validation and improvement if need be. The full implementation of long-term projects will follow after the guidelines have been piloted and in consultation with the Ministry Of Labour and Social Security and other relevant key role actors. The guidelines are recommended for implementation by heads of small scale wood enterprises.

8.6 RECOMMENDATIONS FOR THE EVALUATION OF GUIDELINES IN THE SMALL SCALE WOOD INDUSTRIES

The guidelines will be evaluated during the pilot implementation phase to have an idea of the success rate in achieving the purpose for which they were designed for. Both short term and long term evaluation is necessary to ascertain what is working, what is not, and the impediments to success. This is critical to ensuring continuous improvements at the workplace. It is vital to evaluate each action plan indicator after a specific and significant period of time, grade the overall success of the programme and to ensure that OHS expectations are met. The evaluation may not portray the real image of the process being evaluated if monitoring is not done.

The evaluation exercise will be in the form of survey, where woodshops will be visited to assess the existence of an OHS policy and determine whether all aspects of the policy are complied with while paying attention to the corrective measures put in place, and compare these findings with the baseline findings. This includes for example finding out whether health surveillance for occupational diseases is performed, the availability of appropriate first aids kits and fire extinguisher, provision of continuous training to employees on the use of PPE and electrical equipment, and focus on recommended guideline actions.

8.7 IMPLICATIONS OF GUIDELINES FOR HEADS/OWNERS OF SMALL SCALE WOOD ENTERPRISES

The effective implementation of the proposed guidelines requires the head or management of the various woodshops to provide a conducive work environment that ensures good interaction between the head and employees by increasing participation in decision making and problem-solving, increasing support and feedback, and improving communication. The involvement of workers and their representatives in health and safety promotion requires strategic engagement with workers for them to commit and take ownership of their safety and the safety of their colleagues.

A conducive work environment also involves restructuring workplace policies to boost woodworkers' control over the way they do their work. For example, it allows flexibility to deal with work-life conflict situations, job-sharing, and more consultation about work practices. The goal of management should be to increase the amount and quality of support workers receive. For example, management should introduce people management' training schemes for supervisors, provide supervisory and co-worker support, encourage cooperation and teamwork that fosters positive mental or physical health and possibly reduce psychosocial strain and its negative health consequences.

Also, woodshop bosses or management should familiarise themselves with the recommended evidence-based guidelines and be committed to providing enough of their time to plan and implement programmes.

8.8 IMPLICATIONS FOR THE GOVERNMENT

The ability of any enterprise to implement the proposed healthy workplace guidelines can be influenced by the government's legislative, policy and regulatory disposition. Thus, Governments should create supportive and facilitative environments for healthy workplaces. In Cameroon, collaboration in OHS matters should fall in line with ILO stipulations. The ILO and the WHO should occasionally have Joint workshops on specific OHS issues, and employers and government agencies should be encouraged to participate in these to improve workplace health and safety.

The government should also deploy labour inspectors to the field to play a decisive role in enforcing health and safety, and ensuring that the woodshop owners conform to national laws and regulations. They can realise this by increasing the number of workplace inspections.

8.9 GUIDELINES DISSEMINATION PLAN

All stakeholders involved in the woodworking sector will have unfettered access to these guidelines. The guidelines will be published in a peer reviewed, reputable, scientific and open access journal and the UNISA library website for easy access. Both hard and electronic copies will be distributed to the university and public libraries in the area of the study. The dissemination will also be through presentations at OHS seminars, workshops, and national and international conferences. These guidelines will also be produced in the form of brochures and distributed to the woodshops surveyed.

8.10 CONCLUSION

This chapter has proposed practical guidelines, based on the study findings, literature review and the WHOHWFM that was used to provide grounding for the study. The proposed guidelines are required to promote the OHS practices in small-scale and informal woodworking enterprises in the Fako division of Cameroon. In addition, these guidelines will serve as a vital document for the development of superior policies that are in line with both international and national occupational health and safety legislation. Hence, this should in turn contribute to the improvement of both the physical and psychosocial work environment conditions, thus leading to higher employee job satisfaction and commitment, increased innovation and creativity and prevention of work-related injuries in Fako division in particular and Cameroon in general.

LIST OF REFERENCES

Adei, D & Kunfaa, EY. 2007. Occupational health and safety policy in the wood processing industry in Kumasi, Ghana. *Journal of Science and Technology* 27(2):151-171.

Adeoye, OA., Adeomi, AA, Abodunrin, OL, Olugbenga-Bello, AI & Abdulsalam, ST. 2015. Awareness of occupational hazards and health problems among Sawmill workers in Osun State, Nigeria. *International Journal of Research and Review* 2(1):1-14.

Adu, S, Adu, G, Effah, B, Kwasi, F, Antwi-Boasiako, C. 2015. Safety measures in wood processing: An important component for the entrepreneur - The case of a local furniture industry in Ghana. *International Journal of Innovative Research in Science, Engineering and Technology* 4(5):2319-8753.

Afolabi, FF. 2014. Occupational health hazards among small scale industries in Ondo State Nigeria. *International Journal of Innovation and Scientific Research* 6(1):25-31.

Agbana, BE, Joshua, AO, Daikwo, MA & Metiboba, LO. 2016. Knowledge of occupational hazards among Sawmill workers in Kwara State, Nigeria. *Nigerian Postgraduate Medical Journal* 23(1):25-32.

Alao, JS & Kuje, ED. 2012. Economics of small-scale furniture production in Lafia Metropolis, Nasarawa State Nigeria. *Cambridge Journal of Economics* 3(1):49-54.

Alli, BO. 2008. *Fundamental principles of occupational health and safety*. Geneva: International Labour Office.

Alwis, K. 1998. Occupational exposure to wood dust. Phd Thesis submitted in fulfillment of the requirements for the degree of Doctor of Philosophy. Department Of Public Health And Community Medicine, Faculty Of Medicine, The University Of Sydney New South Wales, Australia: 157-291.

Amin, ME. 2005. *Social sciences research: Conception, methodology and analysis includes bibliographical references and indexes.* Kampala: Makerere University Press.

Asrat, M, Bezuayehu, A & Andualem, H. 2017. Work related injuries and associated factors among small scale industry workers of Mizan-Aman Town, Bench Maji Zone, Southwest Ethiopia. Ethiopian Journal of Health Development 31 (3):208-215.

ATIBT, FAO & ITTO. 2013. *Towards a development strategy for the wood processing industry in the Congo Basin*. From: www.itto.int (accessed on March 7, 2015).

Babbie, E. 2005. *The basics of social research.* 3rd edition. Toronto. Wadworth.

Badirdast, P, Azari, MR, Soussan, S, Ghadjari, A, Khodakarim, S, Davod, P, Fadaei, M & Abolfazl, R. 2017. The effect of wood aerosols and bioaerosols on the respiratory systems of wood manufacturing industry workers in Golestan Province. *Tanaffos* 16(1):53-59.

Bello, SR & Mijinyawa, Y. 2010. Assessment of injuries in small scale sawmill industry of South Western Nigeria. *Journal of Scientific Research and Development* 1558(12):1-11.

Bernard, HR. 2013. *Social research method: Qualitative and quantitative approaches.* Thousand Oaks, California.: SAGE.

Berhe, A, Yemane, D, Gebresilassie, A, Terefe, W, Ingale, L. 2015. Magnitude of occupational injuries and associated factors among small-scale industry workers in Mekelle City, Northern Ethiopia. *Occupational Medicine and Health Affairs* 3(3):1-6.

Bolaj, AO. 2005. Analytical study of carpenters Attitude towards safety and occupational health practice in Oyo State of Nigeria. *Journal of Human Ecology* 18(2):99-103.

Bosan, IB & Okpapi, JU. 2004. Respiratory symptoms and ventilatory function impairment among wood workers in the Savannah belt of Northern Nigeria. *Annals of African Medicine* 3(1):22-27.

Bovenzi, M & Zadini, A. 1990. Treatment of the hand-arm vibration syndrome in Italy. *The Kurume* Medical *Journal* 37:129-130.

Bovenzi, M. 1998. Exposure-response relationship in the hand-arm vibration syndrome: an overview of current epidemiology research. *International Archives of Occupational and Environmental Health* 71(7):493-498.

Boy, S. 2007. Safety of woodworking machinery: benefiting from worker's experience. *TUTB Newsletter March* 18:20-23.

Briner, RB. 2000. Relationships between work environments, psychological, environments and psychological well-being. *Occupational Medicine* 50(5):299-303.

British Standard OHSAS 18001. 2007. Occupational health and safety management systems – requirements:2, 9.

Burns, N & Grove, SK. 2003. *Understanding nursing research*. 3rd edition. Philadelphia: Saunders.

Burns, N & Grove, S. 2009. *The practice of nursing research: Appraisal, synthesis and generation of evidence*. 6th edition. Philadelphia: Saunders Elsevier, St Louis.

Burton, J. 2010. *WHO healthy workplace framework and model: Background and supporting literature and practices.* Geneva: WHO.

Comlan, P, Ezinah, F, Mouanga, A, Kendjo, E, Roy, J & Obiang-Ossoubita, B. 2009. Profile of woodwork-related accidents in Gabon. *Africa Newsletter on Occupational Health and Safety* 19(1):15-17.

Comlan, P, Ezinah, F, NamboWezet, G, Anyunzoghe, ES & Obiang-Ossoubita, B. 2007. Occupational health and safety problems among workers in wood processing enterprises of Libreville, Gabon. *African Newsletter on Occupational Health and Safety* 17(2):44-46.

Cooper, D. 2001. *Improving safety culture: A practical guide*. 2nd edition. London: Applied Biological Science.

Creswell, J W. 2012. *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. 4th edition. Boston: Pearson.

Creswell, JW. 2015. *30 Essential skills for the qualitative researcher*. Los Angeles, CA: SAGE.

Creswell, JW, Klassen, AC, Plano Clark, VL & Smith, KC. 2011. *Best practices for mixed methods research in the health sciences*. The Office of Behavioral and Social Sciences Research. National Institutes of Health.
From:
https://www2.jabsom.hawaii.edu/native/docs/tsudocs/Best_Practices_for_Mixed_Methods_Research_Aug2011.pdf (accessed May 7, 2015).

Demba, E, Malleh, OC. & Mendy, DG. 2013. Prevention of work-related accidents, including high-risk sectors such as agriculture, construction and mining. The Gambia country report. Technical Seminar on "Work Accidents and Occupational Diseases in Africa". ISSA. Gambia, 25-26 April 2013.

Department of Health. 2015. *Ethics in health research: principles, structures and processes*. Pretoria: Department of Health Republic of South Africa.

Department of the Interior Bureau of Reclamation. 2015. *Hierarchy of controls in the reclamation safety and health standards: Safety and Occupational Health Program Action Plan Team 21 Recommendations*. Department of the Interior Bureau of Reclamation, United States of America.

Diwe, KC, Duru, CB, Iwu, AC, Merenu, IA, Uwakwe, KA, Oluoha, UR, Ogunniyan, TB, Madubueze, UC & Ohale, I. 2016. Occupational hazards, safety and hygienic practices among timber workers in a South Eastern State, Nigeria. *Occupational Diseases and Environmental Medicine* 4:63-71.

Effah, B, Antwi, K, Adu & Boampong, E. 2013. The safety culture of artisans at the Sokoban Wood Village Enclave, Ghana. *American International Journal of Contemporary Research* 3(12):121-128.

European Agency for Safety and Health at Work. 2001. *Preventing accidents at work*. Luxembourg: Office for Official Publications of the European Communities.

Faremi, FA, Ogunfowokan, AA, Mbada, C, Olatubi, MI & Ogungbemi, AV. 2014. Occupational hazard awareness and safety practices among Nigerian sawmill workers. *International Journal of Medical Science and Public Health* 3(10):1244-1248.

FAO see Food and Agricultural Organisation.

Foldspang, L, Michael, M, Rants, LL, Hjorth LR, Langholz-Carstensen C, Poulsen, OM, Ulf, J, Ahonen, G & Aasaess, S. 2014. *Working environment and productivity: A register-based analysis of Nordic enterprises*. Nordic Council of Ministers, Hanne Lebech.

Food and Agricultural Organisation. 2013. Promoting decent employment in forestry for improved nutrition and food security. Rome: International Conference on Forests for Food Security and Nutrition. 13-15 May, 2013.
From:
http://www.europarl.europa.eu/RegData/etudes/etudes/join/2011/464436/IPOLEMPL_ET%282011%29464436_EN.pdf (accessed January 15, 2015).

Friis, RH & Seller, TA. 2004. *Epidemiology for public health practice*. Massachusetts: Jones & Bartlett Learning.

Gensby, U, Lund, T, Kowalski, K, Saidj, M, Jørgensen, AKM, Filges, T, Irvin, E, Amick III, BC & Labriola, M. 2012. Workplace disability management programs promoting return to work: A systematic review. *Campbell Systematic Reviews* 17:1-153.

Ghanaian Ministry of Public Health. 2010. *Occupational health and safety policy and guidelines for the health sector*. Ghana: Ministry of Public Health.

Grove, SK, Burns, N, & Gray, JR. 2013. *The practice of nursing research: appraisal, synthesis and generation of evidence*. 7th edition. Philadelphia: Elsevier Saunders.

Gupta, A. 2013. Quality of working life and organizational development. *Scientific Reports* 2(3):687. From: http://doi:10.4172/scientificreports687 (accessed October 18, 2017).

Gyawali, B. 2015. Effective approaches to improve the psychosocial work environment unit of health promotion. *International Journal of Medical Science and Public Health* 4(11)1-6.

Howell, J, Miller, P, Park, HH, Sattler, D, Schack, T, Spery, E, Widhalm, S & Palmquist, M. 2015. *Reliability and validity*. Colorado: Colorado State University. From: http://writing.colostate.edu/guides/guide.cfm?guideid=66 (accessed March 17, 2015).

IAPA see Industrial Accident Prevention Association.

ILO see International Labour Organization.

Industrial Accident Prevention Association. 2007. *Glossary of occupational health and safety terms*. From: http://www.iapa.ca/pdf/iapa_glossary.pdf (accessed September 28, 2015).

International Association Technical Tropical Wood (ATIBT), Food and Agricultural Organization (FAO), ITTO see ATIBT, FAO & ITTO.

International Labour Organization. 1981. *Convention (No. 155). Occupational safety and health convention*. Geneva: International Labour Office.

International Labour Organization. 1985. *Convention (No. 161). Occupational health services convention*. Geneva: International Labour Office.

International Labour Organization. 1996. *Recording and notification of occupational accidents and diseases*: *An ILO code of practice*. Geneva: International Labour Office.

International Labour Organization. 2001. *Guidelines on occupational safety and health management systems.* Geneva: International Labour Office.

International Labour Organization. 2006. *Convention (No 187). Promotional framework for occupational safety and health*. Geneva: International Labour Office.

International Labour Organization. 2009a. *The informal economy in Africa: Promoting transition to formality: Challenges and strategies.* Geneva: International Labour Office, Employment Sector and Social Protection Sector.

International Labour Organization. 2009b. *International labour organization standards on occupational safety and health: Promoting a safe and healthy working environment.* 1st edition. Geneva: International Labour Office.

International Labour Organization. 2011. *Statistical update on employment in the informal economy.* Geneva: ILO Department of Statistics.

International Labour Organization. 2013a. *Safety and health in the use of machinery*. *ILO code of practice*. Geneva, International Labour Office, Programme on Safety and Health at Work and the Environment.

International Labour Organization. 2013b. *Code of practice on safety and health in the use of machinery*. Geneva: International Labour Office.

International Organisation for Standardization. 2001. *Mechanical vibration: Measurement and evaluation of human exposure to hand-transmitted vibration*. Geneva: International Organization for Standardization.

ISO see International Organisation for Standardization.

ITTO see International Tropical Timber Organization.

International Tropical Timber Organization. 2014. *ITTO Biennial work programme 2012-2013: Implementation of Activity PP-A/47-262 "Strengthening the Capacity to Promote Efficient Wood Processing Technologies in Tropical Timber Producing Countries*" Yokohama, August 2014:1-49.

Jette, BL. 2008. Effects of wood dust: Inflammation, genotoxicity and cancer. National research centre for the working environment. PHD thesis. University of Copenhagen: Copenhagen.

Jinadu, MK. 1990. A case-study of accidents in a wood processing industry in Nigeria. *West African Journal of Medicine* 9(1):63-68.

Jirojwong, S, Johnson, M & Welch, A. 2014. *Research methods in nursing and midwifery*. 2nd edition. Sydney: Oxford University Press.

Judd, HM & Wiedenbeck, JK. 2004. Safety in the wood products industry. *Forest Products Journal* 54(10):8-11.

Kiyem, JY. 2009. A Descriptive Analysis of the rights of workers in the informal sector in Cameroon. Cameroon Journal on Democracy and Human Rights 3(2): 17-25.

Kwankye, EA. 2012. Characteristics and compliance to occupational health and safety. A study of Naja David wood industry limited in Kumasi metropolis. Master thesis. Kwame Nkrumah University of Science and Technology, Ghana.

Leka, S, Griffiths, A & Cox, T. 2003. *Work organization and stress*. Geneva: World Health Organization.

Lemasters, GK, Atterbury, MR Booth-Jones, AD, Bhattacharya, A, Ollila-Glenn, N, Forrester, NC 7 Forst, L. 1998. Prevalence of work-related musculoskeletal disorders in active union carpenters. *Occupational and Environmental Medicine* 55:421-427.

Macera, C and staff of the Division of Nutrition and Physical Activity National Center for Chronic Disease Prevention and Health Promotion. 2010. *Promoting healthy eating and physical activity for a healthier nation*. Centre for Disease Control and prevention. Washington. From: https://www.cdc.gov/healthyyouth/publications/pdf/pp-ch7.pdf (accessed October 11, 2017).

Malinowska-Borowska, J. 2014. Coupling forces resulting from the type of chain saw used. *Annals of Agricultural and Environmental Medicine* 21(1):174-178.

Michie, S & Williams, S. 2003. Reducing work-related psychological ill health and sickness absence: A systematic literature review. Occupational and Environmental Medicine 60:3.

Mijinyawa, Y. & Bello, SR. 2010. Assessment of injuries in small scale Sawmill Industry of South Western Nigeria. Agricultural Engineering International. *The CIGR Journal of Scientific Research and Development* 2(3):157-157.

Ministry of Labour and Social Security. 1984. *The National Health and Safety Order No. 039/MTPS/IMT*. Cameroon: Ministry of Labour and Social Security.

Ministry of Labour and Social Security. 1992. *The Cameroon Labour Code Law No. 92/007 of 14 August 1992.* Cameroon: Ministry of Labour and Social Security.

Mitchual, SJ, Donkoh, M & Bih, F. 2015. Awareness and willingness to utilize health and safety measures among woodworkers of a timber processing firm in Ghana. *Journal of Scientific Research and Reports* 6(3):178-188.

Mittlestaedt, A, Bartram, J, Wooler, Pond, K & Mood, E. 2000. *Monitoring bathing waters - A practical guide to the design and implementation of assessments and monitoring programmes.* WHO. Geneva.

Mohan, M, Aprajita, G & Panwar, NK. 2013. Effect of wood dust on respiratory health status of carpenters. *Journal of Clinical and Diagnostic Research* 7(8):1589-1591.

New Zealand Department of Labour. 2011. *Occupational Health Action Plan to 2013 Workplace Health and Safety Strategy for New Zealand to 2015*. Te Tari Mahi: Department of Labour Health and Safety.

Nnedinma, U, David, I, Keith, J & Umeadi, B. 2014. Enforcement of occupational safety and health regulations in Nigeria: An exploration. *European Scientific Journal* 3(2):1857-7881.

Noblet, A & LaMontagne, AD. 2006. The role of workplace health promotion in addressing job stress. *Health Promotional International 2006*. From: https://academic.oup.com/heapro/article/21/4/346/68762 (accessed August 9, 2015).

Occupational Health and Safety Act. 2015. *A guide to Occupational Health and Safety Act.*
From: http://www.labour.gov.on.ca/english/hs/laws/index.php (accessed September 18, 2015).

Ochire-Boadu, K, Kusi, E & Lawer, EA. 2014. Occupational hazards and safety practices: A concern among small scale sawmilling industries in Tamale Metropolis, *Ghana International Journal of Scientific and Technology Research* 10(3):234-236.

Olawuni, PO & Okunola, OH. 2014. Socio-economic impacts of Sawmill Industry on eesidents: A case study of Ile-Ife, Nigeria. *Journal of Economics and Development Studies* 2(3):167-176.

Oluwatosin, AA, Adeleye, AA, Olugbemiga, LA, Adenike, IO & Saliu, TA .2015. Awareness of occupational hazards and health problems among Sawmill workers in Osun State, Nigeria. *International Journal of Research and Review* 2(1):1-14.

Onowhakpor, AO, Abusu, GO, Adebayo, B, Esene, HA & Okojie, OH. 2017 Determinants of occupational health and safety: Knowledge, attitude, and safety practices toward occupational hazards of sawmill workers in Egor Local Government Area, Edo State. *African Journal of Medical and Health Sciences* 16(1):58-64.

Oppliger, A, Rusca, S, Charriere, N, Trinh, VU & Droz, PO. 2005. Assessment of bioaerosols and inhalable dust exposure in Swiss sawmills. *The Annals of Occupational Hygiene* 49(5):385-391.

Ormiston, B. 2013. Dealing with bad vibrations. *Occupational Health* 65(2):27-29.

Order No. 039/MTPS/MT see Ministry of Labour and Social Security.

Orock, FT & Lambi, CM 2014. Constraints on the cultivation of *Colocasia esculenta* in Wetland milieux in parts of the South West Region of Cameroon. *Journal of Agricultural Economics, Extension and Rural Development* 1(4):40-47.

Osagbemi, GK, La-Kadri, RT & Aderibigbe, SA. 2010. Awareness of occupational hazards, health problems and safety measures among sawmill workers in North Central Nigeria. *TAF Preventive Medicine Bulletin* 9(4):325-328.

Polit, DF & Beck, CT. 2004. *Nursing research: Principles and methods.* New York: Lippincott. Williams & Wilkins.

Polit, DF & Beck, CT. 2006. *Essentials of nursing research: Methods, appraisal and utilisation.* 6th edition. Philadelphia: JB Lippincott.

Polit, DF & Beck, CT. 2008. *Nursing research: Generating and assessing evidence for nursing practice.* 8th edition. Philadelphia: Lippincott Williams & Wilkins.

Qutubuddin, SM., Hebbal, SS & Kumar, ACS. 2013. An ergonomic study of work related musculoskeletal disorder risks in Indian Saw Mills. *IOSR Journal of Mechanical and Civil Engineering* 7(5):07-13.

Ratnasingam, J, Ramasamy, G, Ioras, F, Thanesegaran, G & Mutthiah, N. 2016. Assessment of dust emission and working conditions in the bamboo and wooden furniture industries in Malaysia. *Bio Resources* 11(1):1189-1201.

Reinhold, K & Tint, P 2009. Hazard profile in manufacturing: Determination of risk levels towards enhancing the workplace safety. *Journal of Environmental Engineering and Landscape Management* 17:2, 69-80.

Robson, LS, Clarke, JA, Cullen, K, Bielecky, A, Severn, C, Bigelow, PL, Irvin, E, Culyer, A & Mahood, G. 2007. The effectiveness of occupational health and safety management system interventions: A systematic review. *Safety Science* 45:329-353.

Rongo, LMB. 2005. Health risk related to chemicals used in small scale industries in the informal sector in Dar Es Salaam, Tanzania. *East African Journal of Public Heath* 2(2):12-17.

Rongo, LMB & Leon, B. 2005. Qualitative method for assessing dust exposure in small-scale wood industries in the informal sector. *East African Journal of Public Health* 2(1):32-38.

Rongo, LMB, De Haan, S, Barten, F, Msamanga, GI, Dolmans, WMV, Van Naerssen, T, & Heederik, D 2005. Felt occupational and environmental health hazards among workers in small-scale industries in Dar es Salaam, Tanzania: Focus group discussion study. *East African Journal of Public Health* 2(1):21-25.

Rus, RM, Daud, A, Musa, KI & Naing, L. 2008. Knowledge, attitude and practice of Sawmill workers towards noise-induced hearing loss in Kota. *Malaysian* Journal of Medical Sciences 15(4):28-34.

Sabitu, K, Iliyasu, Z & Dauda, MM. 2009. Awareness of occupational hazards and utilization of safety measures among welders in Kaduna Metropolis, Northern Nigeria. *Annals of African Medicine* 8(1):46-51.

Safe Work Australia. 2011. National hazard exposure worker surveillance: Exposure to biological hazards and the provision of controls against biological hazards in Australian Workplaces. Safe Work Australia 9.
From:
https://www.safeworkaustralia.gov.au/system/files/documents/1702/nhews_biologicalmaterials.pdf (accessed May 7, 2016).

SAFE WORK Australia. 2012. *Managing risks of hazardous chemicals in the workplace: Code of Practice*. Safe work Australia. Australia.
From:
https://www.safework.sa.gov.au/uploaded_files/CoPManagingRisksHazardousChemicals.pdf (accessed April 27, 2016).

Saunders, M, Lewis, P & Thornhill, A. 2009. *Research methods for business students.* 5th edition. Harlow: FT Prentice Hall.

Shirin, M. 2010. Risks to the health of wood workers: What can be done? *Zagazig Journal of Occupational Health and Safety* 3(1):1-8.

Siripanich, SW, Siriwong, SW, Keawrueang, PM, Borjan, M & Robson, M. 2014. Incense and joss stick making in small household factories, Thailand. *International Journal of Occupational Health and Environmental Medicine* 5(3):137-145.

Skivington, K, Lifshen, M & Mustard, C. 2016. Implementing a collaborative return-to-work program: Lessons from a qualitative study in a large. *Canadian Healthcare Organization Work* 55(3):613-624.

Smith, J & Noble, H. 2015. *Issues of validity and reliability in qualitative research. Evidence-Based Nursing* 18(2):34-35.

Steven, J. 2012. Occupational health and safety problems among workers wood processing industries in Mutare, Zimbabwe. *Journal of Emerging Trends in Economics and Management Sciences* 3(3):278-285.

Stoewen, LD. 2016. Wellness at work: Building healthy workplaces. *Veterinary Wellness* 57:1188-1191.

Takala, J, Paivi, H, Kaija, LS, Loke, YY, Manickam, K, Tan, WJ, Peggy, H, Tjong, C, Lim, GK, Lim, S, & Gan, SL. 2014. Global estimates of the burden of injury and illness at work in 2012. *Journal of Occupational and Environmental Hygiene* 11:326-337.

Takele, T & Mengesha, A. 2006. *Occupational Health and Safety. In collaboration with the Ethiopia Public Health Training Initiative.* The Carter Center, the Ethiopia Ministry of Health and, and The Ethiopia Ministry of Education. Ethopia: University of Gondar.

Taswell, K & Wingfield-Digby, P. 2008. *Occupational injury statistics from household surveys and establishment surveys: An ILO manual on methods*. Geneva: International Labour Organization.

The Global Occupational Health Network. 2007. Promoting and protecting health at the workplace. *GOHNET Newsletter* 14(8):1-45.

Tsai, Y. 2011. Relationship between organizational culture, leadership behavior and job satisfaction. *BMC Health Services Research* 11(98):1-9.

Tziaferi, SG, Sourtzi, P, Kalokairinou, A, Sgourou, E, Koumoulas, E & Velonakis, E. 2011. Risk assessment of physical hazards in Greek hospitals combining staff's perception, experts' evaluation and objective measurements. *Safety and Health at Work Journal* 2(3):260–272.

Vézina, M, Derriennic, F & Monfort, C. 2004. The impact of job strain on social isolation: a longitudinal analysis of French workers. *Social Science and Medicine* 59:29-38.

Walker, LJ. 2010. *PPE for women*. International Safety Equipment Association. From: http://ehstoday.com/images/ISEA_April.pdf (accessed June 7, 2017).

Work Safe Alberta. 2011. Best practices for the assessment and control of psychological hazards: Best practices guidelines for occupational health and safety in the healthcare industry. *Work Safe Alberta*.
From: www.employment.alberta.ca/ohs-healthcare (accessed April 27, 2017).

Workplace Safety and Health Council and Ministry of Manpower. 2012. *Workplace safety and health guidelines diagnosis and management of occupational diseases in Singapore*:.Workplace Safety and Health Council.
From:
https://www.wshc.sg/files/wshc/upload/cms/file/2014/WSH_Guidelines_Occupational_Diseases%281%29.pdf (accessed April 24, 2015).

Worksafe. 2007. *A guide to safety in the wood products manufacturing industry*. Australia, Victoria.

WorkSafeBC. 2013. *Health and safety for small- and medium-sized woodworking shops*. Workers' Compensation Board of British Columbia, Library and Archives Canada Cataloguing.

World Bank Group. 2007. *Environmental, health and safety guidelines: Sawmilling and manufactured wood products.* New York: International Finance Corporation, World Bank Group.

WHO see World Health Organization.

World Health Organization. 1999. *Global burden of injuries*. Geneva: World Health Organization.

World Health Organization. 2001. *Occupational health: A manual for primary health care workers.* Cairo: Regional Office for the Eastern Mediterranean.

World Health Oragnization. 2009. *Research ethics committees: Basic concepts for capacity-building.* Geneva: Switzerland. WHO Library Cataloguing-in-Publication Data.

World Health Organization. 2012. Improving workers' health worldwide: implementing the WHO global plan o-f action on workers' health. *GOHNET Newsletter* 20:1-32.

World Health Organization. 2014. *Basic documents*. 48th edition. Geneva: World Health Organization.

ANNEXURES

Annexure A

Ethical Clearance from the Department of Health Studies, Unisa

UNISA university of south africa

UNIVERSITY OF SOUTH AFRICA
Health Studies Higher Degrees Committee
College of Human Sciences
ETHICAL CLEARANCE CERTIFICATE

REC-012714-039

HSHDC/482/2015

Date: 25 November 2015 Student No: 5729-154-3

Project Title: Occupational health and safety challenges in small-scale and informal woodworking enterprises if Fako Dividion-Cameroon.

Researcher: Ayuk Betrand Tambe

Degree: D Litt et Phil Code: DPCHS04

Supervisor: Prof L I Zungu
Qualification: PhD
Joint Supervisor: Dr SG Gabe

DECISION OF COMMITTEE

Approved [√] **Conditionally Approved** [ ]

Prof L Roets
CHAIRPERSON: HEALTH STUDIES HIGHER DEGREES COMMITTEE

Prof MM Moleki
ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES

PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRES

Annexure B

The interviewer-administered questionnaire

STRUCTURED INTERVIEW GUIDE FOR WOODWORKERS IN SMALL AND INFORMAL WOODSHOPS/ENTERPRISES

I- IDENTIFICATION OF ENTERPRISE

Questionnaire number_____ Date _____/_____/2016

Town _____ Enterprise identification number_____

Quarter _____ Main products manufactured _____
Nº of years of operation_____

I. SOCIO-DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS OF WOODWOKERS

1.	What is your sex? 01. Male 02. Female.	|__||__|
2.	What is your year of birth? _____/_____/19____ |__|__|	|__|__|
3.	What is your matrimonial status? 01. Single 02.Maried 03.Divorce 04.Widow(er) |__||__|	|__||__|
4.	The highest level of education of the worker: 1. No level 2.Primary 3. Secondary 4. Technical (CAP, Probatoire, BAC and Specialised training) 5. Other specify _____ |__||__|	|__||__|
5.	How were you trained for the job? 01. Apprenticeship 02. Institutional 03. Self-taught 04. No training	|__||__|
6.	What is the duration of the course? |__|__| (months)	|__||__|
7.	If no training, are you willing to undergo the formal training? 01. Yes 02. No |__||__|	|__||__|

8.	How long is your normal work day? Please specify:_____ 01. < 5 hours 02. 5-6 hours 03. 7-8 hours 04. 9-10 hours 05. 11-12 hours	|__||__|
9.	How many days do you work in a week? _____	
10.	General daily work schedule? From_____ To _____	|__||__|
11.	Break periods for workers: From_____ To _____	|__||__|
12.	How long have you worked on your present job? |__|__| (years)	|__||__|
13.	Socio-professional status of the workers in the Workshop. 01. Apprentice 02. temporal worker 03. Permanent worker 04. Working-Owner.	|__|__|
14.	What are your duties? _____	|__|__|
15.	How many workers are working on the site? |__|__| 1.Male |__|__| 2. Females |__|	|__|__|
16.	Structure of the premises. 1. Open 2. Roof only 3. Some side walls 4. Enclosed	|__|__|
17.	Where do you live? 1. In the woodshop 2. Around the woodshop 3. Far from the woodshop	|__|__|

II. KNOWLEDGE AND PRACTICE OF HEALTH AND SAFETY

01. Knowledge of occupational health and safety

a. OHS training

1.	Have you ever heard of Occupational health and safety?	01. Yes 02. No **(Go to 4)**
2.	If yes, Please select the response that best describes the phrase 'Occupational health and safety'?	01. Minimising risk/accidents/injury 02. Taking responsibility to safeguard yourself only 03. None of the above
3.	Where did you get the information? (*select all that applies*)	01. From my professional training 02. Newspaper/TV/Radio/brochures/ printed papers 03. Supervisor
4.	Have you received any training at work in health and safety?	01. Yes 02. No (**Go to 6**)
5.	If yes, What kind of training did you receive? *(select all that applies)*	01. On safe Operation of work equipment 02 On maintenance of work equipment 03 On PPE use 04. None of the above

b. Use and benefits of PPE

6.	Should the employee/worker be made to pay for PPE provided at work?	01. Yes 02. No
7.	Who is supposed to wear PPE where required?(Select all that applies)	01. All workers 02. Apprentice 03. Supervisors 04. Nobody
8	Do know how, when and where to put on PPE	01.Yes 02. No
09.	The use of dust mask by workers protects against?	01. Skin disease 02. lung problems 03. Visual problems 04. I do not know

10.	The use of earplugs by woodworkers protects them from?	01. Skin disease 02. lung problems 03. Hearing loss 04. I do not know

c. Work equipment and maintenance

11.	All work equipment should have a user manual:	01. Yes 02. No
12.	A user manual is a written instruction showing: (select all that applies)	01. How to check the equipment before operating it 02. How to operate the equipment safely 03. I do not know
13.	Who is supposed to operate an equipment/machine without a user manual?	01. All workers 02. Apprentice 03. Supervisors 04. Nobody
14.	Who is responsible for cleaning/taking good care of all equipment including PPE put at the disposal of the workers?	01. Both the employer & employees 02. Employer only 03. Employees only 04. None of the above
15.	Who is supposed to control and repair equipment at the woodshop?	01. Workers 02. Supervisor 03. A competent person 04. None of the above
16.	Why would you not advise your employer to provide obsolete equipment at work?	01. It exposes workers to danger 02. It is cheaper 03. No of the above

2.0. Practice of health and safety at work

No	Practice of health and safety at work	Not at all 1	Yes sometimes 2	Yes always 3
	Practice of OHS training			
1.	Have you received training on health and safety from your current employer?			
2.	Are you trained on the use of PPEs?			
3.	Have you received information from your current employer about the hazards of your work and their risks to your health?			
4.	Are you using OHS guidelines in your workshop			
	Practice relating to the provision and use of PPE			
5.	Are you always supplied with gloves, dust mask, earplugs etc.			
6.	Do you pay for PPE provided at work?			
7.	How often do you use the following personal protective equipment where it is recommended?			
	1. Dust mask where wood dust is produced			
	2. Gloves when planning wood			
	3. Ear protector (ear plugs) where there is high noise			
8.	Are you required to reuse gloves even when it is dirty?			
	Practice of OHS relating to work equipment and maintenance			
9.	Do you use outdated/obsolete equipment			
10.	Do you operate machines without method statement?			
11.	Do you check for proper functioning of equipment/machines before usage?			
12.	Are the machines controlled and repaired by an expert.			
	Practice relating to the Housekeeping aspects			
13.	Do you clean the wood dust on the floor			

14.	It is necessary to have ample working and storage space at the workshop			
15.	Do you have and use waste receptacle			
16.	How do you manage your waste most especially wood dust?			
	01. selling the wood dust for fuel and fertilizer			
	02. disposing at dumping ground			
	03. Allowing the wood dust to accumulate on the workshop's floor.			

III. Nature and magnitude of work-related injuries and diseases

1.	Which of your working tools do you think is the most dangerous? 01. Bandsaw, 02. Spinning machine 03. Sandpaper machine 04. Wood cutter 05.Electric drill 06. Others(*Please specify*)_____	|__|__|
2.	If any, Why is it dangerous? (*(select all that applies)* 01. Wounds easily 02. Burns easily 03. Complicated to mount 03. Shocks easily 04. Other (*please specify*)_____	
3.	Have you ever been involved in any kind of accident in your place of work in the past one year? 1. Yes 2. No ***(go to 12)***	|__|__|
4.	If yes, which place did the accident occur? 1. Woodshop yard 2. Elsewhere 3. No fixed work area	|__|__|

5.	If yes, What kind of injuries did you sustain?	**Yes**	**No**	**Comment & Observation**
	Sprain/strain			
	Cut/open wound			
	Burns / Lacerations			
	Chronic joint or muscle condition			
	backache			
	chest pain			
	Fracture			
	Other injury			
6.	Body location of injury			
	Upper limbs 1. Hand fingers & thumb 2. Shoulder 3. Wrist 4. Forearm 4. elbow			
	Trunk 1. Back 2. Abdomen & pelvic region 3. Chest			
	Lower limbs 1. Knee 2. Ankle 3. Foot & toes 4. Lower leg			
	Head 1. Eye 2. Cranium 3. Face			
	Neck			
	Other locations(specify)_____ _____			
7.	What action did the management take in the event of the accident? 1. Administered first Aids 2. Taken to the Hospital 3. No action 4. Others (specify)_____			|__|__|

8.	Days absent from work 01. None 02. Up to four 03. 5-10 days 04. ≥11 days			|__|__|
9.	If absent from work due to injury, were you paid for those days? 1. Yes 2. No			|__|__|
10.	How did the injury occur?			
	Hitting or being hit or cut by an object			
	Lifting, pushing or pulling object			
	Falls, trips & slips of a person			
	Contact with chemical or substance			
	Contact with hot object			
	Contact with electricity			
	Other specific _____			
11.	What can be the possible reasons for the accident at work?			
	lack of Personal protective equipment (PPE) or insufficient use of this equipment			
	Carelessness			
	Fatigue caused by overworking			
	lack of modern Equipment			
	Lack of skill or inexperience			

Annexure C

Checklist for inspection of OHS policy compliance

CHECKLIST FOR INSPECTIONS OF THE WORKING CONDITIONS IN SMALL SCALE WOODWORKING INDUSTRIES

HOW TO USE THE CHECKLIST

Each work area to be checked will be defined and the appropriate measures to be introduced for improvement will also be defined, i.e.

(a) If the measure is *"in place"* (meaning it is acceptable and in good working condition), a tick will be put under the column (Yes).

(b) If the measure is *"not in place"* (meaning it is needed and therefore the improvement is necessary), a tick will be put under the column (No).

(d) Comments based on observations made and from the available employees for the purposes of clarification will be listed under the column for (comments).

	Workplace condition	**NO=1**	**YES=2**	**Comment & Observation**
1.	Escape ways are not slippery and free of obstacles.			
2.	Adequate lighting and ventilation system			
3.	Frequently confronted with vibration			
4.	Exposure to hazardous physical condition such as excessive heat and cold			
5.	Exposure to hazardous chemicals such as wood dust and diluents			
6.	Appropriate fire extinguishers available			
7.	First aid kits available			

	Occupational health and safety training	NO=1	YES=2	Comment & Observation
1.	Employer keep a completed training records			
2.	Aavailability qualified safety representatives and a health and safety committee and meetings held			
3.	Brochures and newspaper that provide information on OHS issues are available			
4.	Have OHS guidelines in the workshop			
5.	The appropriate use of PPE such as gloves and dust mask by workers as a result training received			

	State of work equipment and maintenance	NO=1	YES=2	Comment & Observation
1.	Use of mostly outdated/obsolete equipment			
2.	Bandsaw, sanders, wood planer, wood cutter machines etc. are maintained regularly in order to reduce noise and vibration.			
3.	All machines have their user manual			
4.	Ensure safe wiring connections for equipment and lights			
5.	Electric hand-held equipment such as jig saw, nail gun, electric drill, hand-held sanders etc. are well insulated against electric shock and heat?			
6.	Regular inspection and repairs of the equipment by an expert/competent person			

	Housekeeping aspects	**NO=1**	**YES=2**	**Comment & Observation**
1.	Have adequate working and storage space.			
2.	Wastes and other unnecessary materials are cleared from workroom.			
3.	Provide conveniently placed waste containers.			
4.	Proper drainage for waste water provided.			

	Health and safety hazards	**NO=1**	**YES=2**	**Comment & Observation**
1.	Woodworkers are confronted with long duration (>4hours) of static posture			
2.	Workers are confronted with carrying of overload			
3.	Workers are not allowed to manipulate or bring inflammable instrument such as matches, gas lighter, ignited cigarette and so on at workplace			
4.	Fire flammable materials such as wood not used for construction of the woodshop			

Annexure D

Letter to respondents to get verbal permission

UNIVERSITY OF SOUTH AFRICA (UNISA)

INFORMED CONSENT

This informed consent form concerns small scale woodworkers in the Fako division who will take part in this research study titled “Occupational Health and Safety Challenges in Small-Scale and Informal Woodworking Enterprises in Fako division, Cameroon”

I am called **Ayuk Betrand Tambe** the researcher of the above mentioned study. I am a Phd student of Department of Health Studies at University of South Africa, South Africa. This research study is the first version project to be carried out by our team.

We are carrying on a study with the main goal to investigating the nature and magnitude of health and safety challenges among workers in small-scale and informal woodworking enterprises in Fako division, Cameroon. The information we would get from the administration of checklist and structural interview may help policy makers in Cameroon to improve the Occupational Health and Safety policies in Cameroon. Both verbal and written information got from the research will would be shed with you. You do not have to decide today whether to participate in this study or not, you might still take a concrete decision after discussions with other persons of your choice about the research. Your participation in this research is entirely voluntary. It is your choice whether to participate or not and you have the right to withdraw from being a respondent any time without any explanation. In case you have not understood a word or phrase in the form, please feel free to stop me so that we can go through the information and I will take time to explain. In case of any question please free feel to ask me or another researcher.

This research will involve your participation in responding to structured interview that will take about half an hour and it will not be audio/video taped. You have been selected because we believe that your experience as woodworker can contribute much to our understanding and knowledge of Occupational Health and Safety challenges in your community. There will be no direct benefit to you, but your participation is likely to help us find out general state of health and safety and make contribution for improvement in

your community. The information contents of this research project will be kept confidential. Further questions could be addressed to the address below or the Research and Ethics Committee of the University of South Africa.

I have read the above information, or it has been read to me. I have had the opportunity to ask questions about it and all questions asked have been answered to my satisfaction. I consent voluntarily to be a respondent in this study.

Name of respondent_____

Signature of respondent _____

Date _____

Ayuk Betrand Tambe
PHD Candidate
University of South Africa
Email:ayuk.betrand@yahoo.com

Annexure E

Letter requesting permission to conduct the study

UNIVERSITY OF SOUTH AFRICA (UNISA)

Letter to the management of the woodshop

Dear Sir/Madam

I am Ayuk Betrand Tambe, a doctoral student in the Department of Health Studies at the University of South Africa, South Africa. As part of the requirements for my doctoral degree I have to complete a research thesis.

My research is on Occupational Health and Safety challenges in Small-scale and Informal Woodworking Enterprises in Fako division, Cameroon. The information we would get from the administration of checklist and structural interview may help policy makers in Cameroon to improve the Occupational Health and Safety policies in Cameroon.

Your enterprise was purposefully selected to participate in this study due to your expertise in the field of woodworking. I am asking permission to administer a structure interview and a checklist which will last approximately 30 minutes. The information resulting from the research is only for the purpose of social scientific research and your enterprise identity and that of others will be held in confidence. The results will be handed to correctional policy makers in Cameroon for possible OHS reforms and published in academic journals.

This research was approved by the Higher Degrees Committee of the Department of Health Studies (UNISA).

I have read the above information, or it has been read to me. I have had the opportunity to ask questions about it and all questions asked have been answered to my satisfaction. I authorise voluntarily the candidate to conduct this research in our enterprise.

Name of Administrator_____

Signature of Administrator_____

Date _____

Ayuk Betrand Tambe
PHD Candidate
University of South Africa
Email:ayuk.betrand@yahoo.com

Annexure F

Letter from South West Regional Delegation of Public Health Cameroon granting permission to conduct the study

REPUBLIQUE DU CAMEROUN
Paix - Travail - Patrie

MINISTERE DE LA SANTE PUBLIQUE

DELEGATON REGIONALE
DU SUD OUEST

Tel: 233 32 22 62 Regional Delegation
233 32 26 18 Regional Fund
P.O.BOX:281 Buea
Email: contact@swrdph.org

MINSANTE

REPUBLIC OF CAMEROON
Peace - Work - Fatherland

MINISTRY OF PUBLICHEALTH

REGIONAL DELEGATION
FOR THE SOUTH WEST

Date: 13 JAN 2016

THE REGIONAL DELEGATE

Ref: R11 /MINSANTE/SWR/RDPH/PS/ 047/273

TO: AYUK Betrand TAMBE,
Department of Health Studies,
College of Human Sciences,
University of South Africa

SUBJECT: Administrative Authorization to Collect Research Data

After a careful review of this study presented to us by this student, we are sure that medical ethics will be respected as the collection of data will be overseen by trained personnel after the consent of the participant has been obtained.

With the clarity of his methodology and in view of the importance of this research in generating important information for the better management of patients, we have no objection to him carrying out his research on *"Occupational Health and Safety Challenges in Small-Scale and Informal Woodworking Enterprises in Fako Division."*

I therefore call on the health facilities concerned and the participants to give this student the necessary assistance needed to enable him carryout this study of scientific importance.

The Regional Delegate of Public Health

Dr. MBOME NJIE Victor

www.minsante.cm|www.swrdph.org

Annexure G

Proof-reading and editing certificate

From: Fontem A. Neba, PhD
Department of English
University of Buea, Cameroon

Date: 8 February, 2018.

To: **Whom it may concern**

Confirmation of proofreading and editing: Mr. **Ayuk Betrand Tambe**

PhD thesis titled: *Guidelines for Promoting Occupational Health and Safety in the Small Scale Woodworking Industry in the Fako Division Of Cameroon*

This serves to confirm that I have proofread and edited Mr. **Ayuk Betrand Tambe**'s above-noted PhD thesis. The linguistic infelicities in this thesis have been attended to and as such the thesis is now ready for submission and examination.

Sincerely,

Fontem A. Neba (Senior Lecturer, English Language Teaching)

Email: mrpintem@yahoo.com

Cell: +237674566325